

FENNER'S COMPLETE FORMULARY

BEING THE

*Sixth Edition of Fenner's Formulary, greatly enlarged,
revised and entirely re-written.*

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CONTAINING

WORKING FORMULAS

FOR ALL

OFFICIAL AND UNOFFICIAL PREPARATIONS GENERALLY USED OR
REQUIRED IN THE PRACTICE OF PHARMACY AND THE BUSI-
NESS OF THE CHEMIST, MANUFACTURING PHARMA-
CIST, MANUFACTURER OF PROPRIETARY MED-
ICINE, PHYSICIAN, PERFUMER, ETC.

A COMPLETE FORMULARY AND HAND-BOOK

*Of Valuable Information for Pharmacists, Manufacturers of
Chemical and Pharmaceutical Preparations, Physicians,
and Students of Pharmacy and Medicine.*

Compiled and written by

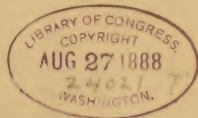
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B. FENNER, PUBLISHER AND PROPRIETOR.
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PREFACE.

WHEN, in 1874, the first edition of FENNER'S FORMULARY (then a small pamphlet) was issued it was the pioneer in a new field of pharmacy, and furnished the first reliable line of formulas for elixirs and the so-called Elegant Preparations which were then coming rapidly into use.

Several editions of this work, each much enlarged and improved, have succeeded each other; but all have been, necessarily, crude and imperfect, representing, as they did, the developing stage of the art of Elegant Pharmacy.

Such as they were, however, they have been received, and adopted by the mass of American Pharmacists as the standard authority for the preparation of this class of galenicals.

During the past decade the advance of Pharmacy and the introduction of new drugs, chemicals and forms of medicine has been so great, that it has outrun the text-books extant, and there has grown up a great want and demand for a new and complete work which shall represent the Pharmacy of to-day as it is practiced throughout the land. The Pharmacopœias and works of authority are all too conservative—representing only a small part of the preparations used. The Dispensatories and other commentaries on the Pharmacopœias partake of the same general characteristics; while the Pharmaceutical Journals (which are the main repositories of unofficial formulas, the record of new preparations and of the advance of Pharmacy) lack the continuity and unity of purpose which is necessary to the value of books of reference and practical works on Pharmacy.

What druggists want, and demand, is a work that in one volume shall give reliable formulas for all or most of the preparations required in the polypharmacy of the present day, and in which they are certain to find, at a glance, some practical information on all subjects connected with or pertaining to the practice of their profession. To make such a work requires patient research and investigation, extended and repeated experiments, careful analyses and syntheses; a thorough knowledge of the wants, conveniences and capabilities of pharmacists, and of the practice of pharmacy as it is in all parts of the country; an intimate acquaintance with the standard text-

books and pharmaceutical literature of all countries; and, last but not least, the ability to collate, compare, condense, classify and arrange, and the genius and experience necessary to originate and formulate, preparations useful to those engaged in the trade.

Realizing the requirements of such a work, as well as its necessity, and knowing the great amount of time and labor necessary to produce it, the author, with great reluctance, and only after repeated solicitation from a great number of those who were using the former editions of Fenner's Formulary, undertook the preparation of this volume. To embody in one book whatever is valuable to druggists of pharmacy, chemistry, materia medica, therapeutics and formulæ has been his aim and purpose. How far it may fulfill that purpose, those who use it will decide.

The former editions of this work have been chiefly devoted to the Elegant Preparations, such as elixirs, fine syrups, medicinal wines, etc., but it was deemed expedient in this edition to include the official preparations as well, and whatever else was necessary to make, as its title indicates, A COMPLETE FORMULARY, to which those in search of information may turn, avoiding the trouble and annoyance of looking through so many books of reference before finding what they seek.

Many new and, as we think, valuable processes have been introduced, which are the outcome of long experience in the preparation of medicines, and as such are submitted.

We have endeavored to make a volume simple, practical, comprehensive, and plain — an every-day companion, counsellor and friend. It has been written mainly in the workshop or laboratory in the midst of the drugs and operations which it describes or directs. As such, no claim is made for its literary excellence, but it is earnestly hoped that it may contribute something of value to the practice and science of pharmacy, and something of pleasure and profit to Pharmacists into whose hands it may fall.

Westfield, N. Y., August, 1888.

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INTRODUCTORY.

IN the arrangement of the formulas in this volume the plan of numbering them has, as in former editions, been adopted. This method saves frequent repetition of the formulas, makes them convenient for reference, and at the same time more particularly designates one from another, as there are in many instances several preparations bearing the same name yet differing in composition.

The official preparations are designated by their Latin titles as given in the Pharmacopœias; but few others are thus distinguished, as they are generally called for or prescribed by their more common names. Prominence is also given to most of the official and to the elegant preparations by printing them in larger type than those of less importance.

Whenever a material difference exists in the formulas official in the U. S. P. and those of the Br., German, French, or other leading pharmacopœias, the composition of the preparation as directed by the different authorities is given. Also, when there is any important difference between the U. S. 1880 and 1870 pharmacopœia preparations, the same is noted in the formula.

In the formulas copied from other works, when the original text is followed, the source from which they are derived is usually mentioned; but when formulas are collated from various sources, and re-arranged, re-written, or re-adjusted to suit the plan of this work, their authority is not generally given, as they are, mostly, public property, having become such by long usage and frequent publication in standard works.

In conformity with the popular usage in this country the quantities directed in the formulas are mostly in the commercial weight and measure of the U. S. The attempts to introduce metric weight and measure or parts by weight of solids and liquids have not met with a favorable reception in this country, although generally used in Continental Europe.

In the article on weights and measures which follows, directions will be found for readily converting weights or measures of one system into those of another.

As this work is intended mainly as a formulary, the description of pharmaceutical apparatus in general use, and the description of medicinal substances, except as given under general headings, is mostly omitted; for the same reason, the tests of chemicals, etc., are not generally given. A brief general description of crude medicinal substances will be found in PART I., and the general working processes employed in pharmacy are briefly described in PART II. For further descriptions, tests, etc., reference may be made to the pharmacopœias, chemistries and other technical works. The medicinal uses

and doses of most preparations are briefly given under their formulas, for convenient reference.

The formulas are, as far as is practicable, arranged in classes. The official formulas and those employed in regular pharmacy are included in PART III., and are classed according to their pharmaceutical similarity, as *elixirs, extracts, fluid extracts, spirits, syrups, etc.* Chemical elements and radicals are noted in their alphabetical order, their salts and combinations being included under the same general headings — as *Sodium and its salts, Potassium and its salts, etc.*

Standard proprietary remedies are included in PART IV., and classed according to their medicinal properties, uses, etc. — as *Ague Cures, Catarrh Remedies, Cough Remedies, etc.*

Toilet articles and perfumes are given in PART V., and are arranged as far as possible according to their uses as *Hair Preparations, Handkerchief Perfumes, Lotions, etc.*

Miscellaneous Preparations, in which are included those not otherwise classified, make up Part VI., and are arranged as far as possible according to their uses.

WEIGHTS AND MEASURES STANDARDS.

The United States Pharmacopœia previous to the 1880 revision and all standard American text-books directed troy weight and apothecary measure. The present revision of the United States Pharmacopœia directs metric weight and measure whenever definite weight and measure is mentioned, but parts by weight are generally directed. The British Pharmacopœia and text-books direct avoirdupois weight and equivalent fluid measure. All of the Pharmacopœias of continental Europe direct parts by weight, or metric weight and measure.

The **Grain** is the equivalent unit of the apothecary, troy and avoirdupois systems of weight. Apothecary and troy weight correspond, the terms of the former only being used by druggists.

The **Scruple** equals 20 grains. It is now seldom used, being expressed in grains instead.

The **Drachm** equals 60 grains or $\frac{1}{8}$ apothecary or troy ounce.

The **Ounce of apothecary or troy** weight equals 480 grains or 1-12 of the apothecary or troy pound of 5,760 grains.

The **Ounce avoirdupois** weight (American commercial and British pharmaceutical standard) equals $437\frac{1}{2}$ grains or 1-16 of the avoirdupois pound of 7,000 grains.

The **Pound of apothecary or troy** weight equals 5,760 grains or 12 apothecary or troy ounces of 480 grains.

The **Pound avoirdupois** weight (American commercial and British pharmaceutical standard) equals 7,000 grains or 16 avoirdupois ounces of $437\frac{1}{2}$ grains.

The **Gramme** is the unit of **metric** weight. A gramme equals 10 decigrammes or 100 centigrammes or 1,000 milligrammes or 15.43 grains.

The **Kilogramme** equals 1000 grammes or 35.27 av. ounces, and is equivalent to the litre.

A **Cubic Centimetre** of water at 4° C. (39° F.) weighs a gramme; therefore the gramme and cubic centimetre are equivalent. It equals $16\frac{1}{4}$ minims.

The **Litre** is the unit of metric fluid measure, and equals 1,000 cubic centimetres, or 10 decilitres or 100 centiliters or 33.84 Am. fl.ounces.

The **Minim** is a variable expression of fluid measure—the 480th part of a fluid ounce. The minim of American fluid measure of water at its greatest density weighs about 0.95 grain, being the 480th part of the American fluid ounce of 455.7 grains of water. The British minim being the 480th part of the British fluid ounce of $437\frac{1}{2}$ grains of water—weighs about 0.91 grain.

The **Fluid Drachm** equals 60 minims or $\frac{1}{8}$ fluid ounce.

The **American Fluid Drachm** of water weighs 56.96 grains, being $\frac{1}{8}$ of the American fluid ounce of 455.7 grains of water.

The **British Fluid Drachm** of water weighs 54.68 grains, being $\frac{1}{8}$ of the British fluid ounce of $437\frac{1}{2}$ grains of water.

The **Fluid Ounce** equals 480 minims or 8 fluid drachms.

The **American Fluid Ounce** of water weighs 455.7 grains, and is $\frac{1}{16}$ of the American pint of 7,291.1 grains of water.

The **British Fluid Ounce** of water weighs $437\frac{1}{2}$ grains, and therefore corresponds with their weight standard (avoirdupois) ounce. It is $\frac{1}{20}$ of the British *Imperial* pint.

The **Pint** of American fluid measure (28.875 cubic inches) equals 7,680 American minims; 7,291.1 grains of water or 16 fluid ounces of 455.7 grains of water, at 60° F.

The **Imperial Pint** of British fluid measure (34.659 cubic inches) equals 9,600 British minims; 8,750 grains ($1\frac{1}{4}$ pounds avoirdupois) of water or 20 British fluid ounces of $437\frac{1}{2}$ grains of water at 60° F.

The **Gallon** of American fluid measure (231 cubic inches) equals 61,440 American minims; 58,328.9 grains of water or 8 American pints.

The **Imperial Gallon** of British fluid measure (277.274 cubic inches) equals 76,800 British minims; 70,000 grains (10 pounds avoirdupois) of water or 8 *Imperial* pints.

The relation of weight to fluid measure as above stated is calculated for distilled water at 15.6° C. (60° F.). The volume of water increases or decreases in a ratio varying with the temperature. At 15.6° C. (60° F.) its volume is 1.000938, as compared with 1.000000, its volume at its greatest density 4° C. (39° F.).

To convert the WEIGHTS of one system into those of another, the following simple rules may be observed: To convert

Troy to Avoirdupois.—Multiply the weight in tr.ounces by 1.097 for close, or by 1.1 for ordinary calculations. The product is the weight in av.ounces.

Avoirdupois to Troy.—Multiply the weight in av.ounces by 0.911 for close, or deduct one tenth for ordinary calculations. The product, or result, is the weight in tr.ounces.

Metric to Grains.—Multiply the weight in grammes by 15.43.

Metric to Troy Ounces.—Multiply the weight in grammes by 0.032.

Metric to Avoirdupois Ounces.—Multiply the weight in grammes by 0.035. In ordinary calculations, $28\frac{1}{3}$ grammes are considered equal to 1 ounce.

Grains to Grammes.—Multiply the weight in grains by 2, and divide by 13. The quotient is the weight in grammes.

Troy to Metric.—Multiply the weight in tr.ounces by 31.1. The product is the weight in metric grammes.

Avoirdupois to Metric.—Multiply the weight in avoirdupois ounces by 28.35. The product is the weight in metric grammes.

To convert the MEASURES of one system into those of another, the following simple rules may be observed: To convert

Apothecary to Imperial Fluid Measure.—Multiply the measure in apothecary fl.ounces by 1.041. The product is the measure in Imperial fl.ounces.

Imperial to Apothecary Fluid Measure.—Multiply the measure in Imperial fl.ounces by 0.96. The product is the measure in apothecary fl.ounces.

Metric to Apothecary Fluid Measure.—Multiply the measure in cubic centimetres by $16\frac{1}{4}$ to reduce to minims, or by 0.034 to reduce to fl.ounces. The litre equals about 2 pints, $1\frac{7}{8}$ Am. fl.ounces.

Metric to Imperial Fluid Measure.—Multiply the measure in cubic centimeters by 0.035 to reduce to Imperial fl.ounces.

Apothecary to Metric Fluid Measure.—Multiply the measure in fl.ounces by 29.53. The product is the measure in cubic centimeters. In ordinary calculations 30 cubic centimeters equal 1 fl.ounce.

Imperial to Metric Fluid Measure.—Multiply the measure in fl.ounces by 28.35. The product is the measure in cubic centimeters.

HEAT MEASURES.

The only scales now used to any extent for registering temperature are those of Fahrenheit, Réaumur, and Celsius; the latter being known in most countries as the *Centigrade* scale. The Fahrenheit scale is chiefly used in America and Great Britain, the Réaumur in Germany, and the Centigrade in France and other countries of Europe, and in scientific calculations in nearly all countries.

Thermometric scales are calculated from the expansion of mercury or alcohol in a small vacuum tube having usually a bulb or reservoir at the bottom.

The CENTIGRADE scale assumes the temperature at which water freezes as 0, and the temperature at which it boils with the barometer at 30 inches, as 100, making 100 between the freezing and boiling point of water.

The FAHRENHEIT scale assumes the temperature at which water freezes as 32, and the temperature at which it boils with the barometer at 30 inches, as 212, making 180 between the freezing and boiling point of water.

The RÉAUMUR scale, which is seldom used in this country, assumes the temperature at which water freezes as 0, and the temperature at which it

boils with the barometer at 30 inches, as 80° , making 80° between the freezing and boiling point of water.

The following table shows a comparison of the scales from the freezing to the boiling point of water :

	C.	F.	R.	
Water	100	212	80	boils.
	95	203	76	
	90	194	72	
	85	185	68	
	80	176	64	
	75	167	60	
	70	158	56	
	65	149	52	
	60	140	48	
	55	131	44	
	50	122	40	
	45	113	36	
	40	104	32	
	35	95	28	
	30	86	24	
	25	77	20	
	20	68	16	
	15	59	12	
	10	50	8	
	5	41	4	
Water	0	32	0	freezes.

It will be seen by the foregoing scales that a Centigrade degree is $1\frac{1}{3}$ Fahrenheit, or $\frac{3}{5}$ Réaumur degrees; that a Fahrenheit degree is $\frac{5}{9}$ Centigrade, or $\frac{4}{9}$ Réaumur degrees; and that a Réaumur degree is $1\frac{1}{4}$ Centigrade, or $2\frac{1}{4}$ Fahrenheit degrees.

The following rules will be found convenient for reducing or converting one scale to another :

To reduce Centigrade to Fahrenheit.

RULE.—*Multiply the given degrees Centigrade by $1\frac{1}{3}$ ($\frac{3}{2}$), and add 32 to the product.*

EXAMPLE.—How many Fahrenheit degrees in 25 Centigrade degrees?
 $25 \times \frac{3}{2} + 32 = 77$ Fahrenheit degrees.

To reduce Réaumur to Fahrenheit.

RULE.—*Multiply the given degrees Réaumur by $2\frac{1}{4}$ and add 32 to the product.*

To reduce Fahrenheit to Centigrade.

RULE.—*Subtract 32 from the given degrees Fahrenheit and divide the remainder by $1\frac{1}{3}$ ($\frac{2}{3}$).*

EXAMPLE.—How many Centigrade degrees in 176 Fahrenheit degrees?
 $176 - 32 \div \frac{2}{3} = 80$ Centigrade degrees.

To reduce Fahrenheit to Réaumur.

RULE.—*Subtract 32 from the given degrees Fahrenheit and divide the remainder by $2\frac{1}{4}$ ($\frac{5}{4}$).*

To reduce Réaumur to Centigrade.

RULE.—*Multiply the given degrees Réaumur by $1\frac{1}{4}$.*

To reduce Centigrade to Réaumur.

RULE.—*Multiply the given degrees Centigrade by $\frac{4}{5}$.*

In reducing Fahrenheit to other scales, or *vice versa*, 32 is added or subtracted, because the Fahrenheit scale is marked 32 where the other scales are marked 0, viz., at the freezing point of water. Bear in mind that in computing degrees below 0 Centigrade, or Réaumur, the product of the multiplication is a minus quantity, and that adding +32 to the minus quantity is the same as taking the difference between them. Recent American works on Pharmacy and Chemistry give both the Centigrade and Fahrenheit degrees, so there is no reason that the druggist should not soon be as familiar with the one as the other.

The temperature at which the specific gravity of substances is usually taken and recorded, is 15.6° Centigrade, or 60° Fahrenheit, or 12.4° Réaumur. In making experiments or calculations that require accuracy, this must be well understood, and the substances to be used must be brought to this temperature.

SUMMARY.

$$1^{\circ} \text{ C.} = 1.80^{\circ} \text{ F.} = 0.80^{\circ} \text{ R.}$$

$$1^{\circ} \text{ F.} = 0.55^{\circ} \text{ C.} = 0.44^{\circ} \text{ R.}$$

$$1^{\circ} \text{ R.} = 2.25^{\circ} \text{ F.} = 1.25^{\circ} \text{ C.}$$

$$\text{C. degrees} \times 9 \div 5 + 32 = \text{F. degrees.}$$

$$\text{C.} \quad " \quad \times 4 \div 5 \quad = \text{R.} \quad "$$

$$\text{F.} \quad " \quad - 32 \times 5 \div 9 = \text{C.} \quad "$$

$$\text{F.} \quad " \quad - 32 \times 4 \div 9 = \text{R.} \quad "$$

$$\text{R.} \quad " \quad \times 9 \div 4 + 32 = \text{F.} \quad "$$

$$\text{R.} \quad " \quad \times 5 \div 4 \quad = \text{C.} \quad "$$

A unit of heat is the amount of heat necessary to raise a certain quantity of water one degree.

The French unit, called a *caloric*, is usually adopted. It is the amount of heat required to raise one kilo (2.2046215 lbs. avoirdupois) of water one degree centigrade; that is, from 0° to 1° C.

SPECIFIC WEIGHT OR GRAVITY.

Specific weight or gravity is the weight of a substance compared with the weight of an equal volume of some other substance taken as a standard.

Distilled water at 15.6° C. (60° F.) is the standard with which all solids and liquids are compared to calculate their specific gravity.

The specific gravity of water is expressed by unity, as 1, 1.00, 1.000, 1.0000, etc., substances heavier than water being more than a unit, lighter than water, less than a unit, expressed in decimals.

Air or hydrogen at 15.6° C. (60° F.), and the barometer at 30 inches, are the standards with which gases are compared to determine their specific gravity.

As applied to pharmacy the specific gravities of solids and liquids only are required, therefore the processes for estimating their specific gravity, only,

will be considered in this article. For the specific gravity of gases our readers are referred to the standard works on Chemistry.

Few druggists are provided with delicate specific gravity apparatus, and indeed it is unnecessary that they should be, for a few simple articles, always at hand, will suffice for the druggists' purpose as well the most elaborate and costly apparatus. A thermometer, a thin bottle and accurate balances or scales are all the apparatus required for finding the specific gravity of liquids and solids, and druggists seldom need to determine the specific gravity of gases.

The following are the simple directions for

CALCULATING THE SPECIFIC GRAVITY OF LIQUIDS.

FIRST.—Take a thin bottle that will hold three or four ounces;* paste strips of paper on two opposite sides and weigh the bottle accurately, marking the weight in grains,† on one of the strips. Then weigh in the bottle just 1000 grains of distilled water at a temperature of 15.6° C. (60° F.) and mark the strips of paper on each side of the bottle just at the surface of the water, when the bottle is standing perfectly level. Mark 1000, the weight of the water, under the weight of the bottle and add them together for the *gross weight*, then empty the bottle and it is ready for use.

SECOND.—Having brought the liquid to be calculated to the required temperature, 15.6° C. (60° F.), pour it into the bottle previously used, until its surface comes just level with the water-level marks on the strips of paper; then weigh it accurately, noting the gross weight in grains.

THIRD.—Find the difference between the gross weight of the first and second operations. If the weight of the first operation is greater than the second, *subtract* the difference from 1000 and point off three places as decimals. If the weight of the first operation is less than the second, *add* the difference to 1000 and point off three places as decimals.

EXAMPLE 1. The gross weight of a bottle with 1000 grains of water is 1723 grains; the gross weight of the same volume of a liquid in the same bottle is 1671 grains. What is the specific gravity of the liquid?

$$1723 - 1671 = 52 \text{ difference.}$$

$$1000 - 52 = 0.948 \text{ specific gravity of liquid.}$$

EXAMPLE 2. The gross weight of a bottle with 1000 grains of water is 1723 grains; the gross weight of the same volume of a liquid is 2184 grains. What is the specific gravity of the liquid?

$$2184 - 1723 = 461 \text{ difference}$$

$$1000 + 461 = 1.461 \text{ specific gravity of liquid.}$$

* A long-necked bottle, that 1000 grains of water will fill into the neck, is the most accurate. Specific gravity bottles, made very light and designed to hold 100 or 1000 grains, or 50, 250 or 500 grammes, may be obtained of dealers in chemical ware.

† Metric weight may be used instead of grains. Grains are mentioned because American druggists are so much more familiar with this weight than with the metric system.

This method of determining the specific gravity of liquids is quite accurate, and very convenient when the bottle is once prepared. It is also adapted to small quantities of liquids as it can be calculated for 100 grains or 10 grains in the same general manner. It can be used also for light or heavy liquids, which is another convenience.

The Hydrometer is an instrument used for determining the specific gravity of liquids. There are many kinds, but nearly all act on the same principle, viz.: The depth to which they sink in the liquid, which is shown by the graduated scale in the stem of the instrument. It is not accurate enough for fine work, and cannot be used for small quantities of liquids.

The Hydrometer is principally useful for showing the proof of spirits, the degree of acids, syrups, etc., but is not adapted to the general work of calculating specific gravity in the business of the pharmacist.

The spirit Hydrometer will not answer for heavy liquids, nor the acid nor syrup Hydrometer for the light liquids.

The Government Hydrometer for spirits which has the thermometer scale attached is of much value in estimating the proof of spirits.

CALCULATING THE SPECIFIC GRAVITY OF SOLIDS.

The druggist is so seldom required to calculate the specific gravity of solids, that mere mention, only, of the methods will be given here.

Solids heavier than water are first weighed in the ordinary way, and then, by suspending them to one side of the balance by a fine thread, are immersed in water and weighed. The ordinary weight divided by the loss of weight in water gives the specific gravity of the solids.

Solids lighter than water are first weighed, and then attached or tied to some heavy metal of known weight and specific gravity; the two substances are then weighed and immersed in water together and the loss of weight of the lighter substance found by deducting the loss of weight of the heavy metal, previously found, from the total loss. The original weight of the lighter substance is then divided by its loss of weight in water, as shown by the former operation and the result is the specific gravity of the substance.

Solids soluble in water are first weighed by the balance and then weighed suspended in some liquid in which they are insoluble, as Naphtha, Alcohol or Oil. The weight in the liquid subtracted from the ordinary weight gives the loss of weight; the ordinary weight is divided by the loss of weight thus obtained, and the quotient multiplied by the specific gravity of the liquid in which the solid was weighed — this gives the specific gravity of the solid.

Powdered substances are first weighed, and their weight added to that of the specific gravity bottle and 1000 grains of water, as described for calculating the specific gravity of liquids. The powder is then put in the bottle and enough distilled water at 15.6° C. (60° F.) added to fill it to the water-level marks on the bottle. It is then weighed and its weight subtracted from the gross weight previously obtained; this shows the loss of weight in water. The ordinary weight of the powder is now divided by the loss of weight as shown by the subtraction; the quotient is the specific gravity of the powder.

PART I.

DRUGS AND MEDICINAL SUBSTANCES.

The substances used in the art of pharmacy are obtained from every part of the known world, and are selected from all departments of the mineral, vegetable, and animal kingdoms. The mineral kingdom contributes the greater portion, the vegetable a great variety, and the animal a fair percentage of the substances which are known in the commercial world as "Drugs."

The collection and preparation of "drugs" for the market constitutes a very great industry, second in importance to none of the commercial industries of the world. In the limited space which we have to devote to this subject, mere mention only of what is most important to druggists can be made, as its elaboration would, of itself, fill a volume.

MINERAL DRUGS.

Nearly every mineral known is, in some form, made use of in pharmacy. Minerals and mineral salts were the first substances employed in medicine. The science of chemistry owes its early advancement to the researches of the alchemists and apothecaries in mineral substances, and the legends of medicine and pharmacy are mainly based upon the wonderful powers and qualities attributed to minerals.

The collection of native mineral substances does not come within the province of pharmacy, and at present but few mineral salts are prepared by pharmacists. That task, which

was formerly a necessary part of the education and business of the apothecary, now being given over to manufacturing chemists, who have better facilities and conveniences for doing it.

In chemistry, all elementary mineral substances are called bases or radicals, from their property of combining with acids to form salts.

The following table of elementary substances includes the minerals, which, with their various combinations and salts, comprise a large share of the so-called "chemicals" used in pharmacy.

TABLE OF ELEMENTARY SUBSTANCES.

U. S. P., 1880.

ELEMENTS	Sym- bol.	Atomic Weight.	Equiva- lent.	ELEMENTS.	Sym- bol.	Atomic Weight.	Equiva- lent.
Aluminium	Al	27	13.5	Molybdenum	Mo	95.5	42.75
Antimony	Sb	120	120	Nickel	Ni	58	29
Arsenic	As	74.9	74.9	Niobium	Nb	94	94
Barium	Ba	136.8	68.4	Nitrogen ³	N	14	14
Beryllium (Glucium)	Be	9	9	Osmium	Os	198.5	99.25
Bismuth	Bi	210	210	Oxygen ⁴	O	16	8
Boron	B	11	11	Palladium	Pd	105.7	52.85
Bromine	Br	79.8	79.8	Phosphorus	P	31	31
Cadmium	Cd	111.8	55.9	Platinum	Pt	194.4	97.2
Caesium	Cs	132.6	132.6	Potassium	K	39	39
Calcium	Ca	40	20	Rhodium	Rh	104.1	52.05
Carbon ¹	C	12	6	Rubidium	Rb	85.3	85.3
Cerium	Ce	141	70.5	Ruthenium	Ru	104.2	52.1
Chlorine ²	Cl	35.4	35.4	Scandium	Sc	44	22
Chromium	Cr	52.4	26.2	Selenium	Se	78.8	39.4
Cobalt	Co	58.9	29.45	Silicon	Si	28	14
Copper	Cu	63.2	31.6	Silver	Ag	107.7	107.7
Didymium	Di	144.6	72.3	Sodium	Na	23	23
Erbium	E	165.9	82.95	Strontium	Sr	87.4	43.7
Fluorine	Fl	19	19	Sulphur ⁵	S	32	16
Gallium	G	68.8	34.4	Tantalum	Ta	182	182
Gold	Au	196.2	196.2	Tellurium	Te	128	64
Hydrogen	H	1	1	Thallium	Tl	203.7	203.7
Indium	In	113.4	56.7	Thorium	Th	233	116.5
Iodine	I	126.6	126.6	Tin	Sn	117.7	58.85
Iridium	Ir	192.7	96.35	Titanium	Ti	48	24
Iron	Fe	55.9	27.95	Tungsten	W	183.6	91.8
Lanthanum	La	138.5	138.5	Uranium	U	238.5	119.25
Lead	Pb	206.5	103.25	Vanadium	V	51.3	51.3
Lithium	Li	7	7	Ytterbium	Yb	172.7	172.7
Magnesium	Mg	24	12	Ytterium	Y	89.8	89.8
Manganese	Mn	54	27	Zinc	Zn	64.9	32.45
Mercury	Hg	199.7	99.85	Zirconium	Zr	90	45

¹ Carbon: 11.9736.

² Chlorine: 35.370.

³ Nitrogen: 14.021

⁴ Oxygen: 15.9933.

⁵ Sulphur: 31.984.

Inorganic Chemical Products.

The process by which substances unite to form other substances or compounds is called *chemical action*, and the force with which they so unite is called *chemical attraction* or *affinity*; mineral chemical substances are called *inorganic*; vegetable and animal chemical substances are called *organic*.

Inorganic Chemical products are produced by the union of mineral bases with acids, and the salts thus composed constitute a large share of the chemicals of pharmacy and commerce. The salts thus formed bear the names both of the base and acid of which they are composed; for examples, acetate of potassium or potassium acetate, sulphate of iron or ferrous sulphate, bi-chloride of mercury or mercuric chloride, etc.

The names of chemical salts are distinguished by certain prefixes or terminations, which indicate in a measure the proportions of the combinations. For a full understanding of these, and chemical nomenclature in general, the reader is referred to standard words of chemistry.

VEGETABLE DRUGS.

By far the greater number of substances used in medicine are of vegetable origin. Nearly every plant that grows has at one time or another played its part in the history of Pharmacy, and newly-discovered ones, with "wonderful virtues," are still being brought to light from "lands beyond the sea."

But little attention is now given by Pharmacists to gathering and curing vegetable drugs; that branch of the business, which was in former time an important part of the trade of the Apothecary, being given over to collectors and others who have better facilities for carrying it on. Vegetable substances are, or should be, gathered at the season when they contain the greatest amount of medicinal value, and are prepared for market in various ways, which depend largely upon the intelligence, experience and convenience of the collectors.

A brief mention of crude vegetable drugs, and the methods

employed for preparing them for the market may not be superfluous.

Balsams.—Many substances of quite different consistence and composition are classed as Balsams. They are generally gathered by puncturing pustular cells in the bark, or by making cuts or incisions in the bark or wood of certain trees or plants. They are liquid, semi-solid or solid.

Barks.—Barks are gathered in the early spring just after the sap has started to flow. The bark may then be readily stripped from the branches, trunk or root, and it contains as much or more medicinal value than at any other season. The bark from twigs or small branches is easiest removed by heating them over a fire and then pounding them with a billet of wood. The trunk-bark of trees is generally removed in slabs or strips, the outer portion being shaved or hewed off and discarded, the inner bark only being used; the root-bark has usually to be shaved off. Barks are dried in the open air or by moderate heat in kilns, evaporators, or other heating apparatus, and come into the market in the form of quills, small slabs, stripes, or broken in small pieces. They are then cut, crushed, ground, or powdered as desired for sale or use.

Berries.—Under the common name of berries are included many of the smaller fruits, like strawberry, raspberry, etc.; the small fleshy fruits, like juniper, ash, and laurel, and the dry, unripe berries, like cubeb, spice, and pepper. The juices of some berries are used, while others are gathered and dried by suitable heating apparatus, to prepare them for the market.

Buds.—A few kinds of leaf-buds, like Balm of Gilead, are gathered, dried, and used in medicine; but the term is usually used in Pharmacy to designate undeveloped flower-buds, of which cloves and cassie-buds are examples. They are gathered in their proper season, and dried in the open air for the market.

Flowers.—Flowers should be gathered in their early blossoming before they have passed their prime; many, even, are best gathered when the buds are opening. They are usually gathered with as little of the stalk as possible, except in the case of plants and herbs, which are gathered entire at the season of

flowering. Flowers should be dried with as little exposure as possible, and packed away in a dry, cool place.

Fruit.—Fruit is a botanical name for all kinds of vegetable-growths enclosing and including seeds; but different kinds of fruit are classed and named according to their peculiarities: as fleshy fruits, of which apples and berries are examples, stone fruits, of which the peach and cherry are examples, and dry fruits, which include nuts, capsular and other dry fruits, seeds, etc. Fruits are generally gathered when the seeds are ripe, and are dried, preserved, or otherwise treated according to their nature and use. Fleshy and stone fruits should be dried in an evaporator or other suitable drying apparatus, while the dry fruits are either sufficiently dry when ripe, or may be dried in the open air. Many of the fruits are classed commercially as berries, nuts, seeds, capsules, etc.

Gums and Gum-Resins.—Among the natural vegetable substances which are collected and put upon the market, a certain class of gums and gum-resins may be included. They are the exudations from plants either from the stings of insects, or from incisions made for the purpose of collecting the gum or gum-resin. The collection of gums and their preparation for the market forms a very large and important industry.

Besides the gums and gum-resins, there are many substances known commercially as gums which are of an entirely different character—as opium, which is a concreted juice, and catechu, which is properly an extract.

Herbs.—In pharmacy herbs are understood to be the upper portion of small plants, including the leaves, flowers and small stalks, the larger stalks and roots being discarded. Commercially, the smaller plants, which are gathered entire, are also classed with herbs. Herbs should generally be gathered when in blossom, carefully dried without artificial heat, and packed away in a cool, dry place.

Plants.—Plants, as the term is understood botanically, include all vegetable-growths, great or small; but in pharmacy the name is generally applied to small plants which are gathered and used entire. They should be gathered about the season of flowering, and dried without artificial heat.

Leaves.—Leaves should be gathered when the plants or trees are at their fullest prime. With plants, this is generally a little before the flowering season; and with trees and shrubs, usually a little before the ripening of the fruit. Leaves should be dried without artificial heat and packed away in a cool, dry place.

Nuts.—Nuts are properly classed with fruits. They are gathered when ripe, thoroughly dried and prepared in various ways for the market.

Roots.—Commercially considered, roots are the parts of plants which grow in the ground; in pharmacy, however, they are divided into several classes according to their nature—as root, rhizome, rootlets, bulb, cormus, tuber, etc., the three latter not being properly classed with roots. Roots should generally be gathered after the leaves are off the plants in the fall, or before they start in the spring. The bark, only, of many woody roots is used, while some are gathered entire, being cut, sliced, crushed or otherwise prepared for market. The rhizome is the main portion of the root or rootstock, to which the rootlets, if any, are attached. Of the roots which consist of rhizome and rootlets, some are used entire, while others, only the rhizome or rootlets may be used.

The bulb, cormus and tuber are classed with roots commercially, but are botanically dissimilar. Bulbs are usually sliced and dried; cormus and tuber may be sliced or dried whole.

Seeds.—Many of the so-called “seeds,” as caraway, cardamom, coriander, fennel, etc., are classed in pharmacy as fruit. The botanical distinction being, that when two or more separate seeds are enclosed by a pericarp or envelope, the structure is called fruit, while the seed itself is a single ovule, containing the embryo and its nutriment. Seeds are generally gathered when ripe and dried if necessary by natural heat. Some of the fruits which are commercially classed as seeds require artificial heat.

Woods.—The greater part of the woods used in the drug-business are for dyeing purposes. A few, however, are used as medicine. They are generally furnished to druggists in chips, or shavings, or ground to the proper fineness for use.

Pharmaceutical and Chemical Products.

The many products which are derived from vegetable substances may conveniently be classed as pharmaceutical and chemical. In the former class may be included such as are generally prepared by pharmacists in their business, and in the latter, such as are usually prepared by the larger manufacturing chemists. Of the former class, fluid extracts, solid extracts, tinctures, spirits, syrups, etc., and of the latter, the alkaloids and their salts, vegetable acids, alcohol and distilled spirits, etc., may be mentioned.

ANIMAL DRUGS.

But few animal substances, comparatively, are used in medicine, yet in the aggregate the drugs derived from the animal kingdom form quite a percentage of the druggists' stock.

In the early days of medicine, animal substances were used to a great extent—the most ridiculous and foolish use being made of them—but, as the science of medicine has emerged from its early superstitions, they have been mostly dropped, and only such as are of known value retained.

The fats and oils obtained from animal tissue constitute the greater portion of animal-matter used in pharmacy. Some expensive animal substances, such as musk and ambergris are used quite extensively in perfumery. Pepsin, pancreatin, albumen, the meat extracts, etc., are used internally. Cantharides is most used externally, and many other animal substances have various uses in medicine or pharmacy.

Pharmaceutical and Chemical Products.

The pharmaceutical products prepared from animal substances are mainly the cerates, ointments and plasters, in which animal fats and wax are used as bases. Several tinctures also are prepared from animal substances, such as cantharides, castor, musk, etc. The chemical products consist mainly of a few alkaloids and their salts, and may include pepsin, pancreatin, etc., as they are not usually prepared except by manufacturing establishments.

PART II.

...

WORKING PROCESSES.

The processes which are here noted are such as druggists do or may employ in their business, without expensive apparatus or special pharmaceutical education. Many other processes are employed by chemists and large manufacturers which it would be needless to detail here, as they would not be used by druggists generally.

DIALYSIS.

The process by which certain substances are separated from other substances with which they are combined in solution, by means of the diffusibility of liquids through a thin membrane, is called Dialysis.

The physical principle, involved in this operation, is that of the diffusion of liquids, called *endosmosis* and *exosmosis*. Although this process is not officinal, it may be frequently employed to advantage in pharmacy, and it no doubt merits more consideration than it has heretofore received.



In pharmacy, dialysis is employed to separate what are known as *colloid* (glue-like) substances, from their combination in solution with crystallizable substances. This is accomplished by means of an apparatus called a Dialyzer, a simple form of which is here illustrated.

This apparatus may be made by any druggist, without expense, and is sufficient for the requirements of most retail dealers. Larger apparatus may be made on the same principle.

It consists of an ordinary white glass 7-inch lamp-shade, the bottom of which is covered over with parchment paper, which is large enough to extend up the sides of the shade nearly two inches, and which is held in place by two rubber bands. The solution to be dialysed is placed in the apparatus thus constructed, and floated on distilled water, contained in any convenient earthenware vessel. (An earthenware milk-pan which is shown in the cut, is convenient for this purpose, or an ordinary wash-bowl may be used.) The dialyzer may be suspended by a string from above, or set upon bottles in the earthenware vessel, so that the surface of the liquid in the dialyzer may be about on a level with the surface of the water in the vessel.

Parchment paper for this purpose may be made by immersing firm, unsized paper in a mixture of two measures of Sulphuric Acid with one measure of water, and afterward washing it thoroughly with pure water to remove all traces of acid. It may also be bought, at a small price, of jobbers or dealers in pharmaceutical apparatus.

Dialysis is applicable only to aqueous solutions, and the process is used sometimes to obtain the colloid, and sometimes the crystalloid, principles from their solutions. The colloid substances are always retained in the floating vessel or dialyzer, while the crystalloid substances are found in the water with which the dialysis is conducted. In working the process to obtain the colloid substances, the water in the vessel should be changed every day; but in working it to obtain the crystalloids, as little water as is necessary for the purpose should be used, for it has subsequently to be evaporated to obtain the crystallizable substance. Gum arabic is a familiar example of a colloid, and sugar, of a crystalloid substance. If they are both represented in a solution, the gum will be retained in the floating vessel, while the sugar will gradually be transferred to the water, in which it floats.

In conducting the process of dialysis it should be continued so long as the water in the lower vessel contains appreciable traces of the soluble crystalloid, or other substance, which the process is designed to remove. Dialysed iron is probably the most familiar colloid preparation made by dialysis.

DISTILLATION.

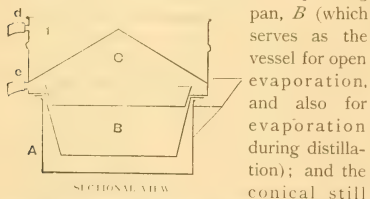
The process of vaporizing a liquid or other substance, by the aid of heat, and then condensing the vapor to a liquid by cold, in an apparatus called a still,* is known as Distillation.

This process is used for separating liquids of a less from those of a greater specific gravity; for separating liquids from soluble substances which they hold in solution; for separating volatile substances from grosser matter with which they are associated, and for purifying and freeing liquids from objectionable matter.

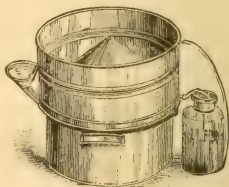
As applied to pharmacy, distillation is employed for recovering alcohol from many preparations which are required to be concentrated by evaporation, such as fluid extracts, solid extracts, etc., for distilling medicinal waters and spirits, for obtaining ethers, essential oils, etc., and for many other purposes.

Although distillation is frequently directed in the Pharmacopœia, no advice nor instructions are given in regard to it, it being assumed that druggists are sufficiently familiar with the

* FENNER'S WATER-BATH AND STILL is a convenient, simple apparatus for evaporating and distilling. It consists of a cylindrical, shallow vessel, *A*,



pan, *B* (which serves as the vessel for open evaporation, and also for evaporation during distillation); and the conical still



FENNER'S WATER-BATH AND STILL.

top, *C*, in which the vapor, which rises, is condensed during the process of distillation. This apparatus is constructed specially for evaporating and distilling; it is low and shallow, having a large bottom surface, fitting it well for rapid evaporation and distillation. Fenner's Water-bath Perculator and Still may be employed for the same purposes, but as it is constructed for percolation also, corresponding sizes do not present so large a surface for evaporation and distillation as does the Water-bath and Still.

Druggists will find it a great convenience to have the Water-bath and Still, as well as the Water-bath Perculator and Still, for they are often both required at the same time.

process to enable them to conduct it properly. A few suggestions, however, may not here be amiss.

To distill medicated waters or other aqueous substances no water-bath is required, the distillation of such liquids being more rapid, and equally as satisfactory, without it. If herbs, leaves, flowers, seeds or other similar substances are to be distilled, they should be protected from contact with the bottom of the still by a false bottom, so that they may not "scorch," and sufficient water should be used with them to prevent the extract which collects at the bottom from "burning down." At least, double the quantity of water that is taken of the drug should be used.

To obtain oils from medicinal plants, seeds, etc., the most approved method is to pass a current of steam through the herbs, or other substances, by which the particles of oil are vaporized and carried over with the steam and condensed, being afterwards gathered from the surface of the water.

To distill or recover Alcohol or any substance of less specific gravity than water, the liquid should be placed in the water-bath and the heat communicated to it, by heating the water surrounding it. The boiling point of the alcohol or other lighter liquid being lower than the boiling point of water, it is vaporized and condensed in the still; the heavier liquids and extractive matter remaining in the water-bath.

When drugs are percolated with alcohol, or a partly alcoholic menstruum, the menstruum remaining in the drug can be recovered by transferring the moist drug to the water-bath of the still and distilling in the usual manner. If the water-bath percolator and still is used, it is unnecessary to transfer the drug, as the still top can be adjusted, heat applied, and the distillation completed without further trouble.

The process of distillation is a very important and economical one in pharmacy, and is much less employed than it should be.

EVAPORATION.

As applied to pharmacy, evaporation is the process by which, with the aid of heat, the volume of liquids or other substance may be reduced. It is employed for many purposes

in the practice of pharmacy, and is so familiar to druggists, that but little need be said regarding it in this article.

The vessels used for evaporating should be broad and low, or shallow, to give a larger surface for the application of heat and the escape of vapor. Evaporating dishes are made of glass, iron (enameled or glazed), platinum, porcelain, tin, etc.

Heat is applied in various ways for the purpose of evaporating—by the ordinary methods, by water-bath, sand-bath, steam, heated air, etc.

For rapid evaporation, heat over an open fire or by means of steam is best; but for making many preparations, such as extracts, fluid extracts, etc., slower evaporation is necessary, that the preparation may not be injured by the heat. For this purpose the water-bath* is the most convenient for druggists' use, as by it the heat can be regulated and maintained at any desired temperature. In large establishments the vacuum pan, which is still better for the purpose, is employed. This consists of a large pan and chamber covering it, from which the air is removed by means of an air-pump, causing the liquid in the pan to evaporate at a much lower temperature than in the open air.

The most serviceable, cheap, evaporating dish, is the ordinary granite-iron stove skillet, or frying-pan. Any ordinary evaporating dish may be set in a vessel of water, which will answer as a water-bath. A sand-bath may be made by partly filling an iron basin with sand and setting the evaporating dish in it.

For very slow evaporation a warming closet may be made, by fastening a box against the wall and heating it with a lamp placed underneath a hole in the bottom; smaller holes should also be provided in the upper surface for the escape of vapor. This box can be so arranged with shelves that a number of evaporating dishes may be placed in it at the same time.

*The water-bath which forms a part of FENNER'S WATER-BATH AND STILL is very convenient for the purpose of evaporation. It is shown in the sectional view on page 26 by the vessels *A* and *B*. FENNER'S WATER-BATH PERCOLATOR (see page 41) may also be used for the same purpose, it being necessary only to put the liquid to be evaporated into the percolator and leave off the cover.

EXPRESSION.

The process of expression is employed more or less for many uses in pharmacy, the apparatus and manner of working being governed by what is required to be done.

In making tinctures, fluid extracts, etc., a considerable quantity of menstruum is left in the drug after the percolation is completed, and it is economy to recover it by pressure in a tincture press or other suitable apparatus; pressure is also employed as the chief operation in some processes for making fluid extracts (see Fluid Extracts). In choosing a tincture press for any purpose, it is not economy to get the smallest sizes, a one- or two-gallon press being none too large for most pharmaceutical work. The drugs to be expressed should be inclosed in a coarse burlap bag or cloth, and the pressure should be long continued rather than too quick and forcible, that the liquid may have time to become separated from the drugs. In pressing pulpy or mucilaginous drugs it is an advantage to mix them with some loose non-absorbing material, rice chaff, for example, to facilitate the operation. Fruit juices, in a small way, are best expressed by hand pressure, except such fruits as lemon, orange, etc., which can be pressed with a lemon squeezer. In a large way, fruit may be pressed in large wooden presses, the layer presses being the best variety for this purpose. In using small presses nothing is gained by trying to press too much at a time, the operation being more satisfactory in moderate quantities.

There are several good kinds of presses to be had for pharmaceutical purposes, the "Enterprize" being as convenient and serviceable as any. There are several so-called "pressure percolators" now sold, but, in our opinion, they are not convenient percolators, and they certainly fail to do the work of a press.

FILTRATION.

The process of separating insoluble matter from liquids, by means of any substance or medium which will prevent its passage, is called filtration.

Filtration, as it is employed in pharmacy, is usually conducted by means of filtering paper contained in a conical receptacle called a funnel;* but larger operations are carried on by other contrivances which will admit of a more rapid filtration.

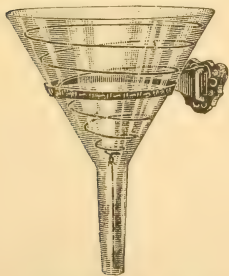
The process of filtration is so familiar that it needs no explanation; but a few suggestions are here made for the benefit of the inexperienced.

In filtering a liquid which contains a precipitate (unless the precipitate is designed to clear the liquid, as magnesia or pumice-stone are used) the liquid should be poured carefully off and filtered first, the precipitated portion being added after most of the liquid has passed through the filter; this makes the process more rapid.

The first portion that passes through the filter should be returned to it and re-filtered, as, when the filter is dry, it admits of the passage of small particles which are retained when its fibers have had time to swell by the absorption of moisture.

In filtering liquids containing albuminous or gummy precipitates, it is also advantageous to put a coarse cotton cloth strainer on the inside of the filter paper; this catches the precipitate or albuminous substance, which may be removed with it, or in which it may be pressed to strain out the liquid, and thus make the filtration more rapid.

*FENNER'S SPIRAL FILTER RACK is a convenience for keeping the filtering paper off the sides of the funnel when filtering. It is made of tinned steel wire, of different sizes to fit different size funnels.



It is simple, cleanly, durable, efficient and cheap. The cut shows it as it is adjusted in the funnel ready for use.

Heat often assists the process of filtering heavy liquids or oils. It may be conveniently applied by putting a filter inside of Fenner's water-bath percolator, and applying heat by means of the water-bath. For supporting the funnel during filtration, Fenner's Funnel Rack, which is shown in the cut, is very convenient.

Further remarks on filtering will be found in the article on "Economy in Percolating and Filtering," page 39.

A plaited filter is generally used, except when a filter-rack is employed, then the ordinary folded (quartered) filter is used.

Besides filtering through paper, other means are often employed by druggists. Syrups and heavy liquids may be filtered through a flannel or cotton strainer, or felt filters that are made expressly for this purpose. Charcoal and sand, in alternate layers, are employed for filtering light liquids when larger quantities are to be filtered.

A little charcoal in powder, or powdered pumice-stone sprinkled in the filter, will often assist to clear preparations that are difficult to filter clear.

FINENESS OF POWDER.

To properly obtain the soluble constituents of drugs by the process of percolation, they should be so comminuted or divided that the menstruum may readily dissolve all soluble matter.

To this end, different drugs are directed to be reduced to different degrees of fineness as experience has shown to be best suited to their nature.

The United States Pharmacopœia has adopted the following standard for the fineness of powders:

<i>A very fine powder</i>	{ should pass through a sieve having 80 or more meshes to the linear inch, }	equals No. 80 powder.
<i>A fine powder</i>	{ should pass through a sieve having 60 meshes to the linear inch, }	equals No. 60 powder.
<i>A moderately fine powder</i>	{ should pass through a sieve having 50 meshes to the linear inch, }	equals No. 50 powder.
<i>A moderately coarse powder</i>	{ should pass through a sieve having 40 meshes to the linear inch, }	equals No. 40 powder.
<i>A coarse powder</i>	{ should pass through a sieve having 20 meshes to the linear inch, }	equals No. 20 powder.

Other degrees of fineness than the foregoing are often directed.

It is desirable for the purpose of percolation that the powder used should be as uniform as possible, it is therefore directed in the Pharmacopœia that "not more than a small proportion of the powder should be able to pass through a sieve having ten meshes or more to the linear inch." While this direction is valuable for securing a uniform powder and thereby promoting the process of percolation, it is, in our opinion, unwise to specify this limit: for in reducing drugs to different fineness of powder by any process which druggists may command, it is obvious that, unless the powder is *very fine*, quite a proportion of it will be much finer than the coarsest powder which will pass through the sieve having the required number of meshes to the inch. If this portion is separated from the coarser powder by sifting, that which remains will not truly represent the entire substance of the drug from which it was prepared.

In preparing a powder, therefore, for percolation the entire quantity of drug which is taken should be reduced to a powder that will pass through a sieve having the required number of meshes; or, if this produces a powder too fine for successful percolation, a coarser sieve should be used; for it is better to use a coarser powder than to remove any portion of the drug which would be represented by the finer powder.

For the reasons stated the powders directed in the formulæ of the U. S. P., are, as a rule, too fine for successful percolation by the majority of druggists, and better results will be secured by using about one grade coarser powder than is designated.

Drugs are usually reduced to the required degree of fineness for percolation by grinding in a drug mill, but when finer powders are required the old, time-honored mortar and pestle comes into play. But few druggists, however, attempt to make what are known in the market as "powdered drugs." They are usually bought of reliable houses who make a business of putting them up.

Drugs "ground for percolation" may also be bought in the market, but as they always come in bulk without the guarantee of a reliable house, they are liable to adulteration, or to be ground from old or worthless drugs, and it is much better for the druggist to grind them himself, as needed, from reliable crude drugs.

INFUSION AND DECOCTION.

The process of INFUSION consists in steeping drugs at a temperature below the boiling point of water, in an aqueous or other menstruum, for the purpose of extracting their soluble medicinal constituents. For this purpose, "infusion pots," which contain a perforated cup or receptacle for the drug, which is surrounded by hot water during the operation, are furnished by manufacturers of chemical ware. A covered granite-ware, or earthen-ware, vessel will answer the same purpose; the water-bath percolator is however the best adapted of any apparatus for the purpose of infusion, as the heat can be maintained and the liquid drawn off by the stop-cock whenever it is desired. For making infusions, boiling water is usually poured upon the drug and the heat continued to nearly the boiling point for from one to two hours.

The process of DECOCTION consists in boiling the drugs in an aqueous menstruum for fifteen minutes or longer to obtain their soluble properties. This may be done in an open or covered vessel, but the process is now but little employed. The water-bath percolator is a very convenient apparatus for decoctions, as the heat may be maintained to boiling for any length of time, and the liquid then drawn off by the stop-cock.

MACERATION.

When percolation came to be the officinal process for exhausting drugs, maceration, the process of our forefathers, was mostly abandoned, but we are glad to see that in the present pharmacopœia its value is again recognized, and that many preparations, which have of late been made by percolation, are now again made by maceration. In addition to this, the new pharmacopœia, in making most of the tinctures and some extracts, gives the very much needed direction to macerate twenty-four hours with a portion of the menstruum before packing in the percolator. Maceration is the necessary primary step to successful percolation. It softens the drug,

dissolves its soluble properties and loads the menstruum with them, ready to be carried away by the subsequent process of percolation.

The new British Pharmacopœia (1885) directs maceration for from twenty-four to forty-eight hours as a preliminary step to percolation in making tinctures, etc. The German, French, and other continental European authorities direct maceration mainly for obtaining the strength of drugs; and although percolation, when properly conducted, has great advantages over any other process for obtaining the strength of drugs, without maceration it fails to accomplish its full purpose.

Whenever percolation is employed, sufficient time should be given for maceration to loosen and dissolve the soluble properties of the drug. If alcohol is the menstruum employed, the maceration may be conducted after packing the percolator; but if water forms a portion of the menstruum, the drug should first be macerated with a portion of the menstruum sufficiently long to allow it to swell before it is packed in the percolator.

Any convenient covered vessel may be used for macerating drugs designed to be percolated. For small quantities, glass, specie or salt mouth jars, earthen-ware fruit jars, or covered granite-ware stew-pans, are very convenient, even tin cans will not be injurious for most drugs. Drugs to be thus macerated should be thoroughly moistened with a portion of the menstruum and covered to prevent exposure and evaporation. When preparations are prepared entirely by maceration, the drugs should be put in a suitable glass jar or vessel, the menstruum added, and be frequently agitated for several days.

PERCOLATION.

The directions for percolation are very complete and minute in the present pharmacopœia; they are therefore repeated here in full;

“ The process of percolation or displacement directed in this (1880) Pharmacopœia consists in subjecting a substance or substances in powder contained in a vessel called a percolator, to the solvent action of successive

portions of menstruum, in such a manner that the liquid as it traverses the powder in its descent to the recipient, shall be charged with the soluble portion of it, and pass from the percolator free from insoluble matter.

“When the process is successfully conducted, the first portion of the liquid or percolate, passing through the percolator will be nearly saturated with the soluble constituents of the substance treated; and if the quantity of menstruum be sufficient for its exhaustion, the last portion of the percolate will be destitute of color, odor and taste, other than that possessed by the menstruum itself.

“The percolator most suitable for the quantities contemplated by this Pharmacopœia should be nearly cylindrical, or slightly conical, with a funnel-shaped termination at the smaller end. The neck of this funnel-end should be rather short, and should gradually and regularly become narrower toward the orifice, so that a perforated cork, bearing a short glass tube, may be tightly wedged into it from within until the end of the cork is flush with its outer edge. The glass tube, which must not protrude above the inner surface of the cork, should extend from one and one-eighth to one and one-half inch (three or four centimetres), beyond the outer surface of the cork, and should be provided with a closely fitting rubber tube, at least one-fourth longer than the percolator itself, and ending in another short glass tube, whereby the rubber tube may be so suspended that its orifice shall be above the surface of the menstruum in the percolator, a rubber band holding it in position.

“The dimensions of such a percolator, conveniently holding 500 grammes of powdered material, are preferably the following: Length of body, fourteen inches (36 centimetres); length of neck, two inches (5 centimetres); internal diameter at top, four inches (10 centimetres); internal diameter at beginning of funnel-shaped end, two and one-half inches (6.5 centimetres); internal diameter of the neck, one-half inch (12 millimetres), gradually reduced at the end to two-fifths of an inch (10 millimetres). It is best constructed of glass, but, unless so directed, may be constructed of a different material.

“The percolator is prepared for percolation by gently pressing a small tuft of cotton into the space of the neck above the cork, and a small layer of clean and dry sand is then poured upon the surface of the cotton to hold it in place.

“The powdered substance to be percolated (which must be uniformly of the fineness directed in the formula, and should be perfectly air-dry before it is weighed) is put into a basin, the specified quantity of menstruum is poured on and it is thoroughly stirred with a spatula, or other suitable instrument, until it appears uniformly moistened. The moist powder is then passed through a coarse sieve—No. 40 powders, and those which are finer, requiring No. 20 sieve, whilst No. 30 powders require a No. 15 sieve for this purpose. Powders of a less degree of fineness usually do not require this additional treatment after the moistening. The moist powder is now transferred to a sheet of thick paper and the whole quantity poured from it into the percolator. It is then shaken down lightly and allowed to remain in that position for a period varying from fifteen minutes to several hours, unless otherwise directed; after which the powder is pressed, by the aid of a plunger of suitable dimensions,

more or less firmly, in proportion to the character of the powdered substance and the alcoholic strength of the menstruum; strongly alcoholic menstrea, as a rule, permitting firmer packing of the powder than the weaker. The percolator is now placed in a position for percolation, and, the rubber tube having been fastened at a suitable height, the surface of the powder is covered by an accurately fitting disk of filtering paper, or other suitable material, and a sufficient quantity of the menstruum poured on through a funnel reaching nearly to the surface of the paper. If these conditions are accurately observed, the menstruum will penetrate the powder equally until it has passed into the rubber tube and has reached, in this, the height corresponding to its level in the percolator, which is now closely covered to prevent evaporation, and the apparatus allowed to stand at rest for the time specified in the formula.

"To begin percolation, the rubber tube is lowered and its glass end introduced into the neck of a bottle previously marked for the quantity of liquid to be percolated, if the percolate is to be measured, or of a tared bottle, if the percolate is to be weighed; and by raising or lowering this recipient, the rapidity of percolation may be increased or lessened as may be desirable, observing, however, that the rate of percolation, unless the quantity of material taken in operation is largely in excess of the pharmacopœial quantities, shall not exceed the limit of ten to thirty drops in a minute. A layer of menstruum must constantly be maintained above the powder, so as to prevent the access of air to its interstices, until all has been added, or the requisite quantity of percolate has been obtained. This is conveniently accomplished, if the space above the powder will admit of it, by inverting a bottle containing the entire quantity of menstruum over the percolator in such a manner that its mouth may dip beneath the surface of the liquid, the bottle being of such shape that its shoulder will serve as a cover for the percolator.

"When the dregs of a tincture, or similar preparation, are to be subjected to percolation, after maceration with all or with the greater portion of the menstruum, the liquid portion should be drained off as completely as possible, the solid portion packed in a percolator, as before described, and the liquid poured on, until all has passed from the surface, when, immediately, a sufficient quantity of the original menstruum should be poured on to displace the absorbed liquid, until the prescribed quantity has been obtained."

The foregoing officinal directions cover the whole *general* subject of percolation, and the remarks which follow are intended as *special* consideration of improved methods, and the difficulties which may arise in applying a general rule to the treatment of a variety of substances.

The fineness of powder—to be used for percolation has been discussed under the article on fineness of powders, but it may be here repeated that the powders directed in the formulæ of the pharmacopœia are, as a rule, too fine for successful percolation, and that the mass of druggists will have "better luck" to

choose a grade coarser powder than is specified in the officinal formulæ.

Moistening the drug is discussed in the officinal process, and in the article on maceration, and it need only be remarked that it is of great importance to have the drug thoroughly and evenly moistened. Many druggists are in the habit of putting the drug in the percolator and pouring the menstruum upon it to moisten it, without even stirring it up; this should never be done, for, frequently, a portion of the drug will “cake” so that it will not become moistened during the entire process of percolation. The drug should *always* be moistened in a basin or other vessel, before putting into the percolator.

Macerating before percolating is discussed in the article on maceration. It may be here repeated, however, that when water is used as a portion of the menstruum for percolation, the drug should be moistened with the menstruum and allowed to macerate for twenty-four hours, in order that it may swell before, instead of after, packing in the percolator.

Packing the percolator. In packing the percolator much depends upon the nature of the drug, the fineness of the powder, etc. Loose, fibrous, or bulky drugs, such as arnica, stillingia, buchu, etc., cannot be packed very firmly, but should be made as compact as possible; heavy drugs, such as aconite root, valerian, golden seal, etc., do not require so much pressure, but will pack much firmer; soft, spongy, or gummy drugs, such as rhubarb, colocynth or squill, should not be packed very firmly; coarse powders, as a rule, should be packed more firmly than fine. The percolator should be packed from the outside towards the centre and as evenly as possible. A disc of paper and then a cover of perforated tin should be placed upon the surface of the powder after it is packed to secure the even distribution of the menstruum as it is poured upon the drug. A glass or earthenware weight may be used with advantage to hold the drug in its place. It should generally be allowed to macerate for some time after the menstruum is poured on before beginning to percolate.

The *flow of percolate* may be regulated by the rubber tube, as directed in the officinal process; by a loose cork in the bottom of the percolator; or, if the water-bath percolator is

used, by the stop-cock. The rapidity with which the percolate should flow, depends very much upon the nature of the drug, and the quantity required to be obtained as compared with the quantity of drug being percolated; for example, fluid extracts should not be percolated so rapidly as tinctures, nor aconite as rapidly as buchu.

With a certain class of drugs, the alcoholic or hydro-alcoholic menstruum, with which the percolation is conducted, may be forced out by adding water after the menstruum has disappeared from the surface of the drug, and thereby make a saving of alcohol; but with others, which soften or make precipitates with an aqueous menstruum, the percolation must be conducted to the end with the same menstruum. The menstruum remaining in the drug after percolation, may be pressed out with a tincture press and the alcohol recovered from it by distillation.

Drugs Difficult to Percolate.

Many drugs present difficulties to the ordinary methods of percolation and require special treatment; this is generally given in the formulæ in which they are found; but they may be classed in a general way as follows:

1. Drugs that soften or make a pulpy mass upon the addition of the menstruum, such as orange, gentian, rhubarb, squill, colocynth, etc. Such drugs should be well moistened and macerated before packing; they should be rather coarsely powdered and rather loosely packed, and the percolation, when begun, should be conducted rapidly, and continued to the end with the same menstruum.

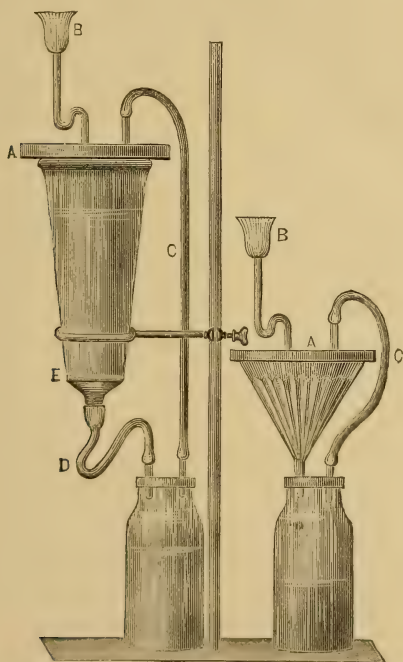
2. Gums and gum-resins which agglutinate or mass together when the menstruum is added. These should be mixed with an equal bulk of sand, sawdust, or rice chaff, and not packed, but placed loosely, in the percolator, and the percolation conducted in the usual manner.

3. Bulky drugs, like arnica, buchu, chamomile, etc. Although these drugs are not difficult to percolate, they absorb so much menstruum that the expense of making their preparations is considerably increased. These should be

packed as firmly as possible, and held down in the percolator with a weight during the process of percolation.

Economy in Percolating and Filtering.

Much loss of Alcohol occurs by evaporation when the ordinary percolator or filtering funnel are left uncovered during percolation or filtration. To remedy this difficulty a simple apparatus may be constructed by any druggist who will take the trouble. It is shown in use in the following cut :



A, is the wooden cover, large enough to fit the top of a percolator or funnel; it is bound with a wooden hoop, whose lower edge projects about half an inch below the under surface

of the cover; to the wooden hoop is tacked a piece of moderately thin-sheet rubber, so that the cover when completed, is like a drum-head, and, when it is used to cover a percolator or funnel, will make, by its elasticity, an air-tight covering.

B, is a funnel tube, so bent as to prevent evaporation or access of air. Through it, fresh menstruum or other liquid may be introduced into the percolator or funnel. A glass or metal tube answers the same purpose, and may be stopped with a cork. This tube may be adjusted by boring a hole in the wooden cover and punching a smaller hole in the rubber, so that it will fit snug around the tube.

C, is a rubber tube attached at one end to a glass tube in the cover (which passes through the rubber as heretofore described), and at the other end to a tube in the stopper of the receiving bottle. This tube allows the air to pass from the receiving bottle into the percolator, and as the liquid fills the bottle the air is forced from it into the percolator or funnel.

D, is a rubber tube attached to the percolator that connects with a tube in the stopper of the receiving bottle, through which the percolate passes; if the lower end of the percolator is too large for the rubber tube, a perforated cork, into which a glass tube is inserted, may be placed in the neck of the percolator for this purpose, as is directed in the pharmacopœia process. By raising or lowering the percolator or the receiving bottle the flow of the percolate can be made more or less rapid, as it works on the principle of the syphon. The receiving bottle may be made of any wide-mouth bottle, holes being bored in the cork for the insertion of the tubes to which the rubber tubing is attached.

E, shows the perforated diaphragm of the percolator.

With this simple arrangement percolation or filtration can be carried on for any length of time without exposure or loss by evaporation.

WATER-BATH PERCOLATION.

The process of water-bath percolation consists in subjecting the powder contained in a percolator, surrounded by water,

to the action of a warm menstruum during the entire process of maceration and percolation. By the means of the water-bath the menstruum and powder are kept at any desired degree of heat for any length of time.*

It is claimed for this process, that the heat employed is of great aid in effecting the solution of the soluble constituents of the substance or substances which are being exhausted, and therefore, that it is much more rapid, efficient and economical than the ordinary method of percolation.

By consulting the solubility tables, which may be found in the pharmacopœia and other standard works, it will be seen that the medicinal principles of vegetable drugs (especially the

* The process of water-bath percolation as applied to pharmaceutical preparations and the apparatus,

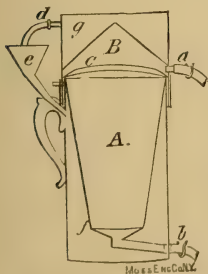
FENNER'S WATER-BATH PERCOLATOR AND STILL,

were patented February 7, 1882.

The process is an application of the well-known fact that a heated menstruum dissolves the soluble portions of drugs much more readily and to a much greater extent than the same menstruum when cold.

The apparatus is constructed with the view of serving its purpose in the best possible manner, and since its introduction it is coming rapidly into use in all parts of the country.

The following is a description and sectional view of the apparatus :



It consists of a Percolator, *A*, suspended in a water-bath and connected externally by a stop-cock through which the percolate is received, and a Still, *B*, which may be adjusted whenever it is needed.

The percolator, *A*, is also the vessel into which liquids are put for evaporation and distillation.

The percolator may be removed by unscrewing the stop-cock at *b*, and lifting it out of the water-bath. It should be removed after using in order to dry the apparatus.

The perforated diaphragm at *f* prevents the drug packing in the neck of the percolator and thereby hindering percolation.

The flow of the percolate can be regulated by the stop-cock ; it also serves to draw off the residue after distillation or evaporation.

The vessel surrounding the Percolator is designed for water which is to be heated when desired, forming a water-bath for the Percolator and its contents.

The Still *B*, can be adjusted when desired, by setting it into the percolator or water-bath. The vapor rises to the inner surface of the cone of the Still,

alkaloids and other substances in which their value chiefly consists), are from several to several hundred times more soluble in boiling water or alcohol than in cold. Although the heat employed in water-bath percolation is seldom so high as boiling alcohol or water, yet the solubility of the medicinal principles is relatively increased according to the heat employed; and, as the object of percolation is to exhaust the drug of its soluble medicinal agents no other argument than this for the application of heat during percolation seems necessary, for it is evident that the value of the drug is much more faithfully represented in preparations made in this manner, and, that in making fluid or solid extracts, or other concentrated preparations, a much less quantity of menstruum is required to exhaust the drug, than when cold percolation is employed.

As the question may be asked by many if heat does not injure the preparations, it may be here stated that the degree of heat directed cannot be injurious, as it is insufficient to volatilize any of the medicinal principles of the drugs.

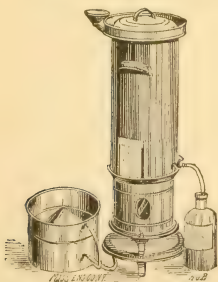
is condensed by the cold water on the outer surface of the cone, and the distillate is discharged in the form of a liquid at *a*, being conducted through a rubber tube to any convenient receptacle.

The following cut represents the Water-bath Percolator and Still detached and in use as a percolator. When used for distilling, the cover of the percolator is to be removed and the still top adjusted as heretofore described. When used for evaporating, the cover of the percolator is to be removed, and the evaporation conducted in the ordinary way.

The water-bath percolator can be used as readily for cold percolation as for warm, and, in short, when all things are considered it is the most serviceable, economical and convenient percolator in use.

These Water-bath Percolators and Stills are now being used to a large extent in all parts of the country, and the reports received from parties who have thoroughly tested them are very flattering.

At no distant day the process of water-bath percolation is bound to supersede the ordinary method of percolating as completely as percolation, when it was introduced, superseded the process of maceration.



The method of conducting water-bath percolation is as follows:

The powdered drug is to be moistened with a portion of the menstruum and either packed in the percolator at once, or after macerating twenty-four hours, as the formula may direct. A certain quantity of menstruum (as directed in the formula) is then to be poured upon the drug and it is allowed to macerate for a specified time in a warm place. It is then to be heated (as directed in the formula) for a certain length of time and the percolation then begun and continued until the drug is exhausted, or until the required amount of percolate is obtained.

The same general directions for packing the percolator, keeping the drug covered with the menstruum, regulating the flow of the percolate, etc., as are specified in the officinal process, should be observed.

In the formulæ contained in this book for making preparations by water-bath percolation, it is directed after packing in the percolator and adding menstruum to the drug, to "set in a warm place" for a certain length of time to macerate; by this it is meant that the percolator and its contents should be heated from 30° to 35° C. (86° to 95° F.) by any convenient means. In summer a warm place in the store will suffice; in winter a shelf by the stove or other heating apparatus will do; or a box, with a hinged door and holes in the bottom about the size of the bottom of the percolators, may be fastened to the side of the wall and the heat may be maintained by a coal oil lamp placed beneath the percolator.

In large establishments warming closets heated by steam pipes or other means may be arranged. It is not absolutely necessary that heat should be maintained during maceration, but better results will follow if it is.

The direction in the formulæ "heat very moderately" means that the temperature should not be higher than from 40° to 45° C. (104° to 113° F.); "heat moderately" means that the temperature should not exceed 60° to 65° C. (140° to 149° F.) — a higher temperature than this is seldom necessary.

After the percolation is concluded, if sufficient Alcohol is

retained in the drug to be of value, it may be recovered by distillation. The amount of alcohol or other menstruum retained varies with the nature of the drug — from one-fourth to more than its entire original weight. In making any considerable quantity of a preparation, it is important to save this menstruum, which would otherwise be wasted, by distillation, as stated in the article on distillation.

SOLUTION.

Solution is the process of dissolving solids or fluids by means of other solids or fluids which combine with them and hold them in a liquid state. The most common forms of solutions are those in which a liquid is dissolved in another liquid, as, for example, an essential oil in alcohol, or a solid in a liquid, as sugar in water; but some solutions are made by the action of solid substances upon each other, as when camphor and hydrate of chloral are combined.

No special apparatus is required for making solutions. Many are made cold, while some are aided by heat with such appliances as druggists usually possess. The solution of some substances is facilitated by reducing them to a fine powder, while others, as scale salts, etc., are best dissolved without being made fine. In dissolving by the aid of heat the water-bath is much employed.

WASHING PRECIPITATES.

The object of washing fresh precipitates is to free them from soluble salts, or other substances with which they are associated, which are soluble in water.

The usual manner of washing fresh precipitates, in a small way, is to pour them upon a wet muslin strainer and filter water through them until the soluble matter has all been washed out.

This method is open to several objections: 1st, exposure to the atmosphere, which rapidly oxidizes many salts, especially

the iron salts, rendering them insoluble; 2d, waste, as considerable of the precipitate is washed away by this method; 3d, inconvenience, as it requires the continued attention of the operator.

Another method is to wash the precipitate in a large jar or earthenware crock, by pouring upon it a quantity of water and stirring thoroughly, then allowing the precipitate to settle, drawing off the supernatant fluid with a syphon, pouring on more fresh water, and thus continuing until the soluble matter is washed out; and then draining the precipitate upon a muslin strainer.

The best method, however, is to make the precipitate in a tall jar or crock, filled full of water; then, having fastened a piece of rubber tubing to each end of a stick, insert it in the jar in such a manner that a stream of water passing through one rubber tube will reach to the bottom of the vessel, while the water at the top of the jar will be carried off by means of the other tube, which acts as a syphon. The water to wash the precipitate can be supplied from a water-pipe, or from a bucket set above the washing apparatus, into which the tube is inserted as a syphon. The same result will be accomplished by running the tube, through which the water is supplied, to the bottom of the jar and allowing the water to overflow at the top.

It will be seen that by this means the precipitate is continually washed, and that it is not exposed, nor wasted, as only clear water is drawn off at the top of the jar, because the precipitate has time to settle away from the surface of the water where the waste tube is attached. Precipitates are rapidly and thoroughly washed by this method. When the soluble substances have all been washed out, the precipitate should be poured upon a muslin strainer to drain, the water may then be pressed out and the precipitate dissolved or dried as required.

PART III.

WORKING FORMULÆ.

In the formulæ which follow we have endeavored to include all preparations generally used or called for that can readily be prepared by druggists. We have made no distinction between officinal and unofficinal formulæ, except to note the former when the original text is followed.

For more convenient reference and comparison we have attempted to classify the preparations as nearly as possible under appropriate headings. We have endeavored to make the formulæ as plain, explicit and comprehensive as possible, and have avoided as much as possible the use of technical terms and tedious processes. The formulæ are made from actual work in the shop or laboratory, and are therefore WORKING FORMULÆ, which cannot fail to give good results, provided they are carefully followed and good material is used. In submitting them to our friends, it is with the earnest hope that they may contribute something to that store of knowledge which raises the pharmacist above the mere tradesman, and that their use may put many a dollar in the pocket of the druggist, which otherwise would be paid as profit to manufacturers.

ABSTRACTA—ABSTRACTS.

These preparations are properly extracts of vegetable drugs so diluted with Sugar of Milk that they represent the soluble medicinal value of two parts of the drug in one part of the abstract. They were introduced in the 6th Revision of the U.

S. Pharmacopœia, to supply a popular demand for "Powdered Extracts"; but as they are only double the strength of the drug their value for such a purpose is questionable. They have not as yet become popular, and it is doubtful if they are retained in a subsequent revision of the Pharmacopœia.

The U. S. Pharmacopœia process for abstracts is in substance as follows:

Exhaust 200 parts of the drug, by percolating with sufficient menstruum, reserving the first 170 parts that pass; evaporate the remaining percolate to 30 parts, adding it to the portion reserved; then add 50 parts Sugar of Milk; allow to evaporate slowly to dryness; powder, and add enough Sugar of Milk to make 100 parts.

The quantitative formulæ for the officinal abstracts are as follows:

1. Abstractum Aconiti.

Abstract of Aconite.

Aconite (root),	200 parts.
Tartaric Acid,	2 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

2. Abstractum Belladonnæ.

Abstract of Belladonna.

Belladonna (root),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

3. Abstractum Conii.

Abstract of Conium.

Conium (fruit),	200 parts.
Diluted Hydrochloric Acid,	6 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

4. Abstractum Digitalis.

Abstract of Digitalis.

Digitalis (leaves),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

5. **Abstractum Hyoscyami.***Abstract of Hyoscyamus.*

Hyoscyamus (leaves),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

6. **Abstractum Ignatiæ.***Abstract of Ignatia.*

Ignatia (seed or bean),	200 parts.
Alcohol 8, to Water 1 part,	
Sugar of Milk, each sufficient to make	100 parts.

7. **Abstractum Jalapæ.***Abstract of Jalap.*

Jalap (root or tuber),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

8. **Abstractum Nucis Vomicaæ.***Abstract of Nux Vomica.*

Nux Vomica (seed),	200 parts.
Alcohol 8, to Water 1 part,	
Sugar of Milk, each sufficient to make	100 parts.

9. **Abstractum Podophylli.***Abstract of Podophyllum.*

Podophyllum (root),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

10. **Abstractum Senegæ.***Abstract of Senega.*

Senega (root),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

11. Abstractum Valerianæ.*Abstract of Valerian.*

Valerian (root),	200 parts.
Alcohol,	
Sugar of Milk, each sufficient to make	100 parts.

12. Abstracts, by Water-Bath Percolation.

It is obvious that drugs from which abstracts are to be made may be much more readily and economically exhausted by water-bath percolation than by the cold process—much less menstruum being required to exhaust the drug, and the result much more perfectly representing the active medicinal agents. The following sample formula, which corresponds with the official strength, but differs in manner of making, will serve as a general formula for making abstracts by water-bath percolation.

Abstracts of other drugs may be made in the same general manner, by using the menstruum which is best suited to obtain the medicinal value of the drug without obtaining an unnecessary quantity of worthless extractive matter. The menstruum which is employed for making the Fluid Extract of the drug (see Fluid Extracts) will generally be proper to use for making the abstract.

13. Abstract of Aconite.

Aconite (root), No. 60 powder,	16 ounces.
Tartaric Acid,	75 grains.
Alcohol,	
Sugar of Milk, in fine powder, each sufficient to make,	8 ounces.

Moisten the drug with 6 ounces of Alcohol, and pack very firmly in the water-bath percolator. Pour upon it 10 ounces of Alcohol and set in a warm place for three days; then heat moderately [to about 60° C. (140° F.)], and after one hour begin to percolate, adding Alcohol to the drug, and continuing the heat until 12 ounces have passed, which reserve. Continue the percolation until the drug is exhausted (or until

about 12 ounces more have passed). Evaporate this last percolate by distillation to about 3 ounces, and add to the portion previously reserved. Dissolve the acid in the liquid, add 4 ounces of powdered Sugar of Milk, and set aside in a moderately warm place [not over 50° C. (122° F.)], in an evaporating dish covered with gauze. Let remain until evaporated to dryness, then powder, weigh, and add enough powdered Sugar of Milk to make 8 ounces.

The Alcohol remaining in the drug after percolation may be recovered by distillation.

ACETA—ACETATES—VINEGARS.

Acetates.—Acetates are chemical or pharmaceutical products in which acetic acid is used as a combining factor, or a solvent for medicinal principles. The Acetates may be conveniently classed as follows:

Chemicals, in which Acetic Acid unites with Alkalies, Alkaloids, or metallic bases to form chemical salts; as Acetate of Potassium, Acetate of Morphine, Acetate of Lead, etc.

Solutions, in which Acetic Acid is combined with some base but not sufficiently concentrated to crystallize, as solution or liquor Acetate of Ammonium, solution Acetate of Iron; or simple solutions of Acetic salts in water or other liquid, as solution Acetate of Morphine, etc.

Tinctures, in which an Acetic solution is diluted with an alcoholic liquid, as tincture Acetate of Iron.

Vinegars, in which the medicinal value of the drug is obtained by Acetic or diluted Acetic Acid as a menstruum. In this class is included the Acetic fluid extracts, and the proper *aceta* or *vinegars* which have long been known as pharmacopœial preparations, and which will now be considered.

The Vinegars which were once quite popular galenicals are now but little used; they still hold their place, however, in the pharmacopœias. In the formulæ for Vinegars which follow we have found it impracticable to exactly follow the pharmacopœias, because of the difference in name and acid strength of Dilute Acetic Acid directed by different authorities, and

some other peculiarities. We have therefore adopted a general 10 per cent. Standard of the active ingredient, and generally the Diluted Acetic Acid of the U. S. Pharmacopœia which contains 6 per cent. of real Acetic Acid. We have also added a small percentage of Alcohol in most of them, as is customary in Continental Europe, because we are satisfied that it is an advantage to the preparations. If fluid extracts are used instead of crude drugs this addition will be unnecessary.

14. Acetum—Vinegar.

Vinegar was formerly officinal in the U. S. Pharmacopœia, but is now deleted. It is still retained in the British, German and many other Pharmacopœias.

It should contain from $5\frac{1}{2}$ to 6 per cent. of absolute Acetic Acid. When directed to be used, the ordinary commercial Vinegar may generally be employed or Diluted Acetic Acid of the U. S. Pharmacopœia, which contains about the same percentage of Acid, may be used instead of it.

Acetification.—Acetification is the process by which Saccharine or hydro-alcoholic liquids are converted into vinegar. It consists in the partial dehydration and subsequent oxidation of the liquids by contact with the atmosphere. Domestic vinegar-making is carried on in nearly every household by exposing cider, saccharine or vinous liquids to heat and air. In a large way vinegar is manufactured by running the liquids many times through generators filled with beech-shavings or corn-cobs, and perforated with numerous holes to admit free circulation of air by which the oxidation is rapidly accomplished.

15. Acetum Aromaticum.

Aromatic Vinegar.

(Adapted from the German and French Pharmacopœias.)

Oil of Lavender,	1 part or	5 minims.
Oil of Peppermint,	1 part or	5 minims.
Oil of Rosemary,	1 part or	5 minims.
Oil of Juniper,	1 part or	5 minims.

Oil of Cinnamon,	1 part or 5	minims.
Oil of Lemon,	2 parts or 10	minims.
Oil of Cloves,	2 parts or 10	minims.
Alcohol,	300 parts or $3\frac{1}{3}$	fl.ounces.
Diluted Acetic Acid,	450 parts or 5	fl.ounces.
Water,	1,200 parts or $13\frac{1}{4}$	fl.ounces.

Dissolve the oils in the Alcohol, add the Acid and Water, and, after standing a few days, with frequent agitation filter through paper.

This is used as an Aromatic toilet preparation and sometimes internally as a mild Aromatic Acid.

Several proprietary articles similar to this, as Bully's Aromatic Vinegar, etc., etc., have a popular sale as toilet requisites.

16. Acetum Cantharidis.

Vinegar of Cantharides.

(ADAPTED FROM THE BRITISH PHARMACOPŒIA, 1885.)

Cantharides, bruised,	1 part	or 455 grains.
Glacial Acetic Acid,	1 fl. part	or 1 fl.ounce.
Acetic Acid, sufficient to make, 10 fl. parts or 10 fl.ounces.		

Mix $6\frac{1}{2}$ fl.ounces of the Acetic Acid with the Glacial Acetic Acid, and the Cantharides in a strong well-stopped quart bottle. Digest the mixture in a water-bath by boiling gently for two hours, then transfer to a glass percolator and percolate, adding enough Acetic Acid through the drug in the percolator to make 10 fl.ounces. It will be observed that this is made with strong Acetic Acid instead of dilute as is usual with the Vinegars. This is a strong vesicant used for blistering. It may be applied with a camel-hair pencil.

17. Acetum Colchici.

Vinegar of Colchicum Seed or Tuber (Root).

Colchicum Seed or Tuber in coarse powder,	729 grains.
Alcohol,	1½ fl.ounces.
Diluted Acetic Acid, sufficient to make	16 fl.ounces.

Mix the alcohol with three ounces of the Diluted Acetic Acid, and macerate the powder in the mixture for 24 hours;

then transfer to a glass percolator, and percolate, adding, when the liquid has disappeared from the top, diluted Acetic Acid, and continuing the percolation until 16 fl.ounces are obtained.

This preparation is officinal in several of the European Pharmacopœias. It is preferably made from the tuber (root), and is a very good preparation of Colchicum, but is not much used in this country. It is given for rheumatism and gout, the dose being from 5 to 30 minims.

18. Acetum Digitalis.

Vinegar of Digitalis.

Digitalis Leaves, in coarse powder, . . . 729 grains.
 Alcohol, 2 fl.ounces.
 Diluted Acetic Acid, sufficient to make 16 fl.ounces.

Make in the same manner as Acetum Colchici. A heart stimulant, diuretic and nervine. Dose $\frac{1}{2}$ to 1 fl.drachm, not exceeding 3 fl.drachms per day. This corresponds very nearly to the formula of the German Pharmacopœia.

19. Acetum Lobeliæ.

Vinegar of Lobelia.

Lobeliæ Herb in coarse powder, . . . 729 grains.
 Alcohol, 2 fl.ounces.
 Diluted Acetic Acid sufficient to make 2 fl.ounces.

Make in the same manner as Acetum Colchici. An emetic, expectorant, antispasmodic, etc. Dose 5 to 30 minims. This corresponds with the United States Pharmacopœia, 1880 formula, except in the addition of the alcohol.

20. Acetum Opii, U. S., 1880.

Vinegar of Opium.

Opium in powder, 729 grains.
 Nutmeg in powder, 218 grains.
 Sugar, 1458 grains.
 Diluted Acetic Acid, sufficient to make 16 fl.ounces.

Mix the Opium and Nutmeg and macerate them with 12 fl.ounces of Diluted Acetic Acid for 24 hours, then drain off

the liquid, put the drugs in a percolator and percolate with the liquid; dissolve the sugar in the percolate by agitation, and add enough Diluted Acetic Acid through the percolator to make 16 fl.ounces of the mixture.

The addition of $1\frac{1}{2}$ fl.ounces of Alcohol would, in our opinion, be an advantage in this preparation. Used for the same purposes as other preparations of Opium. Dose 5 to 15 minims.

The U. S., 1870, Vinegar of Opium contained 1200 grains of Opium in a pint, and care must be used in dispensing not to mistake one for the other.

The following formula, which is similar to several which are officinal in Europe, is preferable to our own :

21. Acetum Opii Compositum.

Aromatic Vinegar of Opium. British Black Drop.

Opium in powder,	729 grains.
Nutmeg in powder,	218 grains.
Saffron in powder,	73 grains.
Sugar in powder,	1458 fl.ounces.
Alcohol,	2 fl.ounces.
Diluted Acetic Acid, sufficient to make	16 fl.ounces.

Make in the same manner as Acetum Opii. Dose 5 to 15 minims.

22. Acetum Sanguinariæ.

Vinegar of Blood Root.

Sanguinaria in powder,	729 grains.
Alcohol,	$1\frac{1}{2}$ fl.ounces.
Diluted Acetic Acid sufficient to make	16 fl.ounces.

Make in the same manner as Acetum Colchici. A stimulant to the mucous membrane. Used mainly as an expectorant. Dose 10 to 30 minims.

This corresponds with the 1880 United States Pharmacopœia, except in the addition of the alcohol. It is officinal only in the United States.

23.

Acetum Scillæ.*Vinegar of Squill.*

Squill, in coarse powder, 729 grains.

Alcohol, 1½ fl.ounces.

Diluted Acetic Acid sufficient to make 16 fl.ounces.

Make in the same manner as Acetum Colchici.

Expectorant and Diuretic. Dose 10 to 60 minims.

This corresponds with the 1880 United States Pharmacopœia, except in the addition of Alcohol.

The British Pharmacopœia, 1885, formula nearly corresponds with the U. S. 1870—directing 1 part of squill in 8, instead of 1 in 10 as above.

ACIDA—ACIDS.

A great variety of widely different chemical substances are classed and included under the general name *Acids*.

In a popular sense acids are substances having a sour taste and capable of turning vegetable blues red; but in chemistry, acids are compound substances having one common and essential property, viz., that of combining with metallic bases, alkalies or alkaloids to form new compounds which are called *salts*. As Hydrogen is a constant element in all acids it is called the *Acid former*, and an acid must be considered a salt whose metal is *hydrogen*, which is displaced in part or wholly when salts are formed with other bases.

Several substances are classed among the acids which are not properly acids but anhydrides; for example, Carbonic Acid Gas CO_2 , Arsenious Acid As_2O_3 , Chromic Acid CrO_3 , etc. These are not true acids, because they do not contain hydrogen.

Acids are gaseous, liquid or solid, and are classed as *inorganic* and *organic*, the inorganic being mostly derived from mineral, and the organic from vegetable and animal substances. The mineral acids are but little used in medicine except when compounded with other drugs, but the salts formed by their union with bases comprise a large share of the chemicals employed by pharmacists. The organic acids are very numerous and form an important class of pharmaceutical products, com-

prising the valuable medicinal properties of many vegetable and animal substances.

In pharmacy the Latin name of the acid follows *Acidum*, as *Acidum Nitricum*, but when rendered in English the name precedes the generic term, as *Nitric Acid*. In chemistry the names and their terminations generally indicate the composition of the acid, as hydrogen *nitrite* HNO_2 (*Nitrous Acid*); hydrogen *nitrate*, HNO_3 (*Nitric Acid*).

Acidification is the chemical process by which substances combine to form acids, or the state in which they exist in nature as acids.

The following tables of acids most frequently used in pharmacy will be convenient for reference. The strength and nomenclature of acids officinal in the United States correspond with the present U. S. P. The solid acids are more properly classed with chemicals, and are so numerous that only those most frequently used in pharmacy can be mentioned:

LIQUID ACIDS FREQUENTLY USED.

NAME OF ACID.	Chemical Symbol.	Specific Gravity.	Real Acid per cent.	SOURCE.
Acetic	$\text{HC}_2\text{H}_3\text{O}_2$	1.048	36.	{ From Wood, etc., by distillation.
Acetic, Diluted		1.008	6.	
Acetic, Glacial		1.057	99.	
*Carbolic, or Phenic	$\text{C}_6\text{H}_5\text{HO}$	1.060	100.	{ From Coal Tar by distillation
Carbolic, Liquified (Br. 1885)		1.065	90.	
Formic	$\text{HC H}_2\text{O}$	1.063	25.	{ From Ants, etc.
Hydriodic, Diluted	HI	1.077	10.	From Iodine.
Hydrobromic, Diluted	HBr	1.077	10.	From Bromine.
Hydrochloric (Muriatic)	HCl	1.160	31.9	{ From Chlorides
Hydrochloric, Diluted		1.049	10.	{ and H_2SO_4
Hydrocyanic, Diluted	HCN	0.997	2.	{ From Cyanides and H_2SO_4
Hypophosphorous, Diluted...	H_3PO_2	1.060	10.	{ From Phosphorus.
Lactic	$\text{HC}_3\text{H}_5\text{O}_3$	1.212	75.	{ From Sour
Lactic, Diluted, (Br. 1885)...		1.040	11.2	{ Milk, etc.
Nitric	HNO_3	1.042	69.4	{ From Nitrates and H_2SO_4 .
Nitric, Diluted		1.059	10.	
Nitro-hydrochloric	$4\text{HNO}_3 \cdot 15\text{HCl}$	1.215	39.8	{ Mixed Acids.
Nitro-hydrochloric, Diluted ..		1.043	12.1	
Oleic	$\text{HC}_{17}\text{H}_{33}\text{O}_2$	0.875	95.	From Fats.
Phosphoric (Orthophosphoric)	H_3PO_4	1.347	50.	{ From Phosphorus and HNO_3
Phosphoric, Diluted		1.057	10.	
Sulphuric	H_2SO_4	1.840	100.	
Sulphuric, Diluted		1.082	10.	{ From SO_2 and HNO_3 .
Sulphurous	SO_2	1.022	3.5	{ From Valerian.
Valerianic	$\text{HC}_5\text{H}_9\text{O}_2$	0.935	100.	

* Carbolic Acid liquifies at about 95°F . The Sp. gr. mentioned is taken at its melting point.

SOLID ACIDS FREQUENTLY USED.

NAME OF ACID.	Chemical Symbol.	Molecular Weight.	SOURCE.
Arsenious (Anhydride)	As_2O_3	197.8	{ Arsenic by Sublimation.
Benzoic	$\text{HC}_7\text{H}_5\text{O}_2$	122.	{ Benzoin by Sublimation.
Boric or Boracic	H_3BO_2	62.	Soda Borax.
Chromic (Anhydride)	CrO_3	100.4	{ Bichrom. Potass. and H_2SO_4 .
Citric	$\text{H}_3\text{C}_6\text{H}_5\text{O}_7\text{H}_2\text{O}$	210.	{ Lime or Lemon Juice.
Gallic	$\text{HC}_7\text{H}_5\text{O}_3\text{H}_2\text{O}$	188.	From Nutgalls, etc.
Oxalic	$\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$	126.	{ Sugar or Starch, and HNO_3 .
Phenic or Carbolic	$\text{C}_6\text{H}_5\text{HO}$	94.	{ Coal Tar or Petroleum.
Phosphoric, Glacial	HPO_3	80.	Phosphoric Acid.
Picric or Carbazotic	$\text{C}_6\text{H}_3(\text{NO}_2)_3\text{O}$	227.	{ Carbolic and Nitric Acids.
Pyrogallic	$\text{C}_6\text{H}_6\text{O}_3$	126.	{ Gallic, by Sublimation.
Salicylic	$\text{HC}_7\text{H}_5\text{O}_3$	138.	{ Carbolic and Carbolic.
Tannic	$\text{C}_{14}\text{H}_{10}\text{O}_9$	322.	From Nutgalls, etc.
Tartaric	$\text{H}_2\text{C}_4\text{H}_4\text{O}_6$	150.	{ From Cream of Tartar.

24.

Acidum Aceticum.

Acetic Acid.

The U. S. official Acetic Acid contains 36 per cent. of real Acetic Acid. The new Br. Ph. (1885) directs an acid containing 33 per cent., while the German Standard directs only 30 per cent. for a corresponding preparation.

Glacial Acetic Acid is practically a pure or 100 per cent. acid, therefore the U. S. official Acid may be prepared from it, if desired, by taking

Glacial Acetic Acid, . . . 36 parts, or $4\frac{1}{2}$ ounces av.
 Distilled Water, . . . 64 parts, or 8 ounces av.

The official Acetic Acids of other pharmacopœias may be made in the same manner relatively.

25. Acidum Aceticum Dilutum.

Diluted Acetic Acid.

Acetic Acid (36 per cent.), 1250 grains or $25\frac{1}{8}$ fl.ounces.

Distilled water sufficient to make a pint.

Mix.

This is the base of the U. S. official Aceta, and is about the same acid strength as good vinegar.

26. Acidum Aceticum Glaciale.

Glacial Acetic Acid.

This is prepared by adding concentrated Sulphuric Acid to freshly fused Acetate of Sodium in a retort and distilling. It contains from 90 to 99 per cent. of absolute Acetic Acid. The German Pharmacopœia very properly calls this Acetic Acid, Essigsäure, while it calls the 30 per cent. preparation Diluted Acetic Acid, Verdünnte Essigsäure. In making up German formulas or prescriptions this should be remembered, as they have no preparation that corresponds to our Dilute Acetic Acid.

27. Acidum Aceticum Aromaticum.

Aromatic Acetic Acid.

Oil of Cloves,	3 fl.drachms.
Oil of Lavender,	2 fl.drachms.
Oil of Lemon,	2 fl.drachms.
Oil of Bergamot,	1 fl.drachm.
Oil of Thyme,	1 fl.drachm.
Oil of Cassia,	20 minims.
Glacial Acetic Acid,	1 fl.ounce.

Mix, and shake frequently until dissolved.

This is used as an odorateur for smelling bottles or vinegar-ettes, and a refreshing scent for the sick room.

28. Acidum Carbolicum.

Crystallized Carbolic Acid—Phenic Acid or Phenol.

This is prepared from coal tar and the refuse of petroleum, by treating with caustic alkalies, subsequent neutralization and distillation. *Crude Carbolic Acid* is an oily liquid largely used for disinfecting. The *Crystallized Acid* is used in medicine, and is furnished by manufacturers, of different degrees of purity; it becomes liquid at from 95° to 100° F.

29. Acidum Carbolicum Liquidum.

Liquefied Carbolic Acid.

Crystallized Carbolic Acid, 100 parts or 10 ounces av.

Distilled Water, 10 parts or 1 ounce av.

Melt the acid and add the water while melted, it will then remain liquid. As carbolic acid is solid at ordinary temperatures, this makes a convenient preparation to use in place of the crystals, and as it is 90 per cent. strong it may generally be used when carbolic acid is designated or prescribed unless crystallized carbolic acid is specially mentioned. This is official in the new British and German Pharmacopœias. The dose when given internally is from 1 to 3 minims, largely diluted.

Solutions of carbolic acid in water are made varying from 1:1000 to 1:20 (5 per cent.), the latter being a saturated solution. (See "Solutions.")

30. Acidum Hydrobromicum Dilutum.

Diluted Hydrobromic Acid.

This contains 10 per cent. by weight of hydrobromic acid gas, HBr. It is best made by passing a current of sulphuretted hydrogen through a solution of bromine 1 part in water 15 parts, distilling and diluting to a 10 per cent. solution. As this process cannot be conveniently used by druggists the following formula is given, which (although it does not make

a perfectly pure acid) is sufficiently pure for general use, and is about the officinal strength.

Bromide of Potassium,	3	ounces av.
Tartaric Acid,	$3\frac{5}{8}$	ounces av.
Distilled Water,	16	fl.ounces.

Dissolve the salts separately each in 8 ounces of water and mix the solutions, agitate thoroughly and set aside in a cold place (preferably on ice) for 12 hours, then decant the clear liquid and filter. It is advantageous to let this solution remain for some time in a cool place to crystallize the acid tartrate of potassium.

This is used for the same purposes as bromide of potassium, and is an excellent solvent for quinine.

The dose is from 30 to 60 minims, in water.

31. **Acidum Hydrochloricum.**

Hydrochloric Acid—Muriatic Acid.

The United States officinal hydrochloric acid contains 31.9 per cent. of real acid, and is what is supplied by manufacturing chemists as C. P. hydrochloric or muriatic acid. The new British Pharmacopœia directs about the same strength, while the German Pharmacopœia directs an acid containing only 25 per cent. of real acid. This acid is frequently called for as oil of salt or spirit of salt. It is sometimes given as a tonic and stomachic, largely diluted with water, or used in stimulating baths.

32. **Acidum Hydrochloricum Dilutum, U. S.**

Diluted Hydrochloric Acid—Diluted Muriatic Acid.

Hydrochloric Acid, . . . 6 parts or 2415 grains.

Distilled Water, . . . 13 parts or q. s. to make a pint.

Mix, and preserve in glass stoppered bottles.

This contains 10 per cent. by weight of real acid, and very nearly corresponds with the British, which contains 10.58 per cent. The German officinal preparation contains 12.5 per cent. of real acid.

The dose is from 10 to 30 minims.

33. Acidum Hydrocyanicum Dilutum.

Diluted Hydrocyanic Acid—Prussic Acid.

This is prepared by distilling hydrocyanic acid gas HCN from a solution of ferrocyanide of potassium and sulphuric acid, into water or water containing a small percentage of alcohol, until the solution contains 2 per cent. of the gas. It is generally prepared by manufacturing chemists in this manner, but may be prepared by druggists as follows:

Cyanide of Silver,	6 parts or 60 grains.
Hydrochloric Acid,	5 parts or 50 grains.
Distilled Water,	45 parts or 1 fl.ounce.
Alcohol,	10 parts or 2 fl.drachms.

Mix the hydrochloric acid with the distilled water, add the cyanide of silver, and shake the whole together in a glass-stoppered bottle. When the precipitate has subsided, pour off the clear liquid and add to it the alcohol.

This acid should be kept from the light in a cool place, in small glass-stoppered bottles.

It is chiefly used as a sedative for nervous disorders and in cough mixtures.

The dose is from 1 to 3 minims.

34. Acidum Hypophosphorosum Dilutum.

Diluted Hypophosphorous Acid.

This is a 10 per cent. solution of hypophosphorous acid gas H_3PO_2 , commonly called hypophosphorous acid, prepared in a large way by boiling milk of lime with phosphorus, and by other methods.

It may readily be prepared by decomposing hypophosphite of calcium with oxalic acid and is generally so prepared by druggists, after the formula proposed by Procter (1858).

Hypophosphite of Calcium (Lime), . .	480 grains.
Oxalic Acid,	350 grains.
Distilled Water, a sufficient quantity.	

Dissolve the hypophosphite in 6 ounces, and the oxalic acid in 4 ounces of water, separately, and mix the solutions. When the precipitate (oxalate of lime) has subsided, pour off

the liquid, and reserve; transfer the moist precipitate to a filter, pour upon it 3 ounces of water, and when it has ceased to drop, add the liquid to that previously reserved, filter, and evaporate the filtrate to $8\frac{1}{2}$ fl.ounces. This contains about 10 per cent. of real acid, and is used mainly in combination with syrups or solutions of hypophosphites. It may, however, be prescribed in doses of $\frac{1}{2}$ to 1 fl.drachm.

35. **Acidum Lacticum.**

Lactic Acid.

This acid is found in sour milk and is generally called "concentrated lactic acid." It contains about 75 per cent. of real acid. It is produced by the fermentation of the milk sugar in the presence of casein, and is seldom prepared except by manufacturing chemists. It is used as a solvent for phosphate salts, the products being termed, *lacto-phosphates*. In medicine it is used for diabetes, liver complaints, stomach troubles, etc.

Dose, $\frac{1}{4}$ to 1 fl.drachms or more, diluted.

36. **Acidum Lacticum Dilutum.**

Diluted Lactic Acid.

The new British Pharmacopœia directs this to be prepared as follows:

Lactic Acid, 3 fl.ounces.

Distilled Water, sufficient to make . . 20 fl.ounces.

Mix.

This contains about 11.25 per cent. of real acid.

The dose is $\frac{1}{2}$ to 2 fl.drachms.

37. **Acidum Nitricum.**

Nitric Acid.

This is prepared by manufacturing chemists from nitrates and sulphuric acid.

The acid directed in the United States Pharmacopœia is what is commercially termed "C. P." nitric acid.

The United States, British and French Pharmacopœias direct a preparation containing about 70 per cent., while the German official acid contains only 30 per cent. of real acid.

38. Acidum Nitricum Dilutum, U. S.*Diluted Nitric Acid.*

Nitric Acid, 1 part or 1103 grains.

Distilled Water, 6 parts or q. s. to make a pint.

Mix, and preserve in glass-stoppered bottles.

This contains 10 per cent. of real acid. The new British Pharmacopœia directs a preparation containing 17.44 per cent. of real nitric acid.

This is sometimes given as an acid tonic in doses of 20 to 40 minims.

39. Acidum Nitro-Hydrochloricum, U. S.*Nitro-Hydrochloric Acid, 1880—Nitro-Muriatic Acid, 1870.*

As the 1870 and 1880 United States preparations are so different, they are both presented.

	1870.	1880.
Nitric Acid, by weight, . . .	3 ounces,	1 $\frac{1}{3}$ ounces.
Hydrochloric Acid, by weight, . . .	5 ounces,	5 ounces.

Mix in a graduate of at least double the capacity of the preparation. This should be made several days before using to give the acids time to combine thoroughly.

This is used as a solvent for gold, and medicinally as a tonic, in baths, the proportion for baths being from 1 to 4 fl.ounces to a gallon of water.

40. Acidum Nitro-Hydrochloricum Dilutum.*Diluted Nitro-Hydrochloric Acid, 1880—Diluted Nitro-Muriatic Acid, 1870.*

As the proportions of the 1870 and 1880 Pharmacopœias are so different, we give them both.

	1870.	1880.
Nitric Acid,	720 grains.	320 grains.
Hydrochloric Acid,	1200 grains.	1200 grains.
Distilled Water, sufficient to make	a pint.	a pint.

Mix the acids in a large graduate, and when effervescence has ceased add the water.

The 1885 British Pharmacopœia directs this acid to be made as follows:

Nitric Acid,	3 fl.ounces.
Hydrochloric Acid,	4 fl.ounces.
Distilled Water,	25 fl.ounces.

Add the acids to the water and keep the mixture in a glass-stoppered bottle for 14 days before it is used. This very nearly corresponds with the U. S. 1870 formula.

The dose of this acid is from 5 to 20 minims largely diluted.

41. **Acidum Oleicum.**

Oleic Acid.

This is the fatty acid with which alkalies and bases unite to form soaps or oleates. It is prepared by manufacturing chemists, by treating fats with superheated steam or by the saponification of olein. It is used chiefly for making the class of galenicals called "Oleates," which see.

42. **Acidum Phosphoricum.**

Phosphoric Acid.

The present United States officinal phosphoric acid is a liquid of the consistence of thin syrup (sp. gr., 1.347), containing 50 per cent. of orthophosphoric acid.

The 1885 British Pharmacopœia has a similar, but more concentrated, preparation, which is called "concentrated phosphoric acid." It contains 66.3 per cent. of real acid and has sp. gr. 1.500. The German officinal phosphoric acid contains only 20 per cent. of real acid, and has sp. gr. 1.120. The United States officinal preparation is very convenient, as it can be diluted with four times its weight of distilled water for the officinal diluted phosphoric acid. This acid is seldom prepared by retail druggists, but may be readily made by those who wish, but as it is supplied at a fair price by manufacturing chemists it is hardly profitable to make it in a small way. It should be kept on hand for making dilute phosphoric acid extemporaneously in small quantities, as that spoils if long prepared.

Phosphoric acid is used mainly as a solvent for mineral phosphates, and for making diluted phosphoric acid. It is a nerve tonic and vitalizer. The dilute acid is usually prescribed.

Glacial phosphoric acid is a solid, impure metaphosphoric acid, now but little used.

A late process of making phosphoric acid by slow atmospheric oxidation has been proposed by Adolph Sommer, of California, and as it is of general interest to pharmacists, and may readily be employed by them, we repeat a portion of it here. The entire article was published in THE FORMULARY, January, 1886:

NEW PROCESS FOR MAKING PHOSPHORIC ACID.

Several forms of apparatus may be employed for making phosphoric acid from phosphorus by atmospheric oxidation. Three of these forms are herewith described:

I.

A common tin can, with removable cover, is made perfectly watertight by resoldering the seams. Through the center of the cover a hole is punched just large enough for the stem of a long thermometer to pass through, and three or four more holes, if not more than $\frac{1}{8}$ inch in diameter are made near the circumference of the cover. All around the inside of the can there is suspended by little hooks, which are formed by making incisions into the upper edge of the can, a piece of cloth reaching from the top to the bottom of the can. In the can is placed a glass jar which must be able to hold at least $3\frac{1}{2}$ times as much water by weight as there is P. to be oxidized. A funnel, amply large enough to hold the P., and wider than the jar, is placed upon the latter, and the funnel tube loosely closed by a piece of glass. [Instead of a glass jar and funnel a bottle may be used which has been cut in two at about three-fourths of its height. The upper and smaller portion of the bottle is inverted and placed into the lower portion, and answers the purpose of holding the P. quite well.] Four or five times as much water as the weight of the P. is then poured into the space between the tin can and the glass jar, and the whole apparatus filled with carbonic acid gas. When by the extinction of a burning taper, which is introduced into the upper portion of the can, it becomes evident that the atmospheric air has been entirely displaced, the sticks of P. are laid in the funnel, the thermometer bulb buried between the sticks of P., the cover put on the can, and all openings, save one, closed by plugs. Through the open hole carbonic acid is passed into the apparatus for a short time, in order to remove the air which has entered the apparatus during the introduction of the P. When

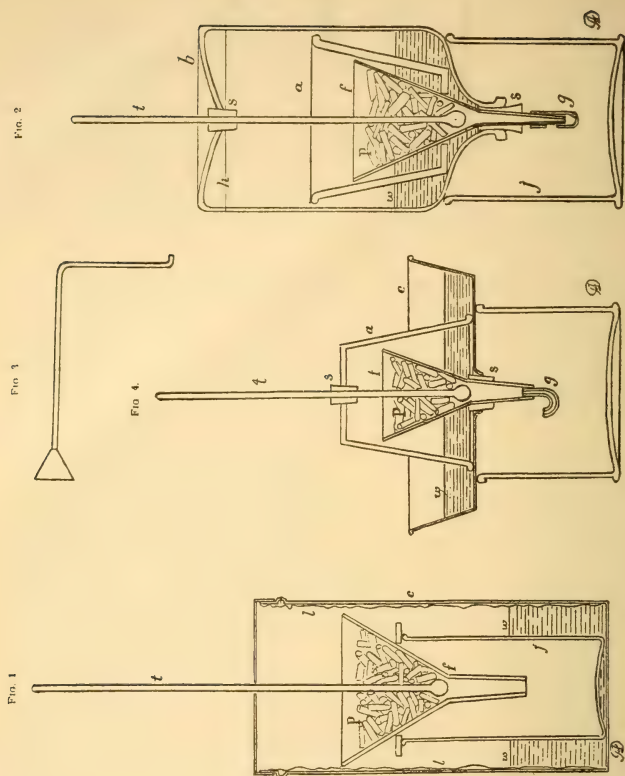


FIG. 1.—*f*, funnel filled with P ; *t*, thermometer ; *j*, glass jar ; *w*, water ; *L*, cloth lining ; *c*, tin can.

FIG. 2.—*f*, funnel filled with P ; *t*, thermometer ; *j*, glass jar ; *w*, water ; *b*, bottle (inverted) ; *s*, perforated stopper ; *a*, flower pot ; *g*, glass tube with opening on its side ; *h*, line of the cut.

FIG. 4.—*f*, funnel filled with P ; *t*, thermometer ; *j*, glass jar ; *w*, water ; *s*, perforated stopper ; *a*, flower pot ; *g*, bent glass tube ; *c*, tin pan.

this is considered accomplished, the last hole is closed, the apparatus put in a cool place, which is not exposed to draught, and allowed to stand at rest for some time. When it is observed that the temperature within remains constant, one hole is opened and the apparatus left undisturbed for at least 24 hours. If the temperature within this time has not approached 35° C., another hole may be opened, and the same precautions observed as before. The number of holes that can thus be opened, before the critical temperature (above 35° C.) is reached, depends of course upon the temperature of the atmosphere surrounding the apparatus. If, at any time, from an excessive supply of air, or from an unusually high temperature of the atmosphere, the temperature of the P. should rise above 35° C. there is great danger that it will, as the writer has found to his sorrow in several instances, rapidly reach the melting point of P., which is 45° C. When this occurs and the P. melts it will naturally run into the receiver (the glass jar), and there, being screened from the action of the air by a covering of acid liquid, congeal into a solid cake. It then becomes necessary to take the apparatus apart, to remove the P. from the receiver, and to recommence the whole operation. After, however, the apparatus has once been regulated, it requires no further attention until the P. is entirely oxidized, which can be known by the thermometer indicating the same temperature within the apparatus as prevails without.

It may seem desirable to have an explanation of some of the features adopted in this apparatus. The water in the apparatus was found necessary, because the ordinary atmospheric air does not contain sufficient moisture to dissolve the coating of oxides formed on the sticks of P. as rapidly as it is formed; but it was also found, that, unless by some means, the water was brought to the space above the P., the air entering the apparatus would not become moist sufficiently fast to produce the effect desired. A piece of cloth, lining the inside, and capable of drawing the water from the bottom to the top of the apparatus, suggested itself as the simplest means of effecting this purpose, and it does fulfill this function very satisfactorily. The reason for the adoption of several small holes instead of a single large opening, as a means of regulating the supply of air, is so evident that it needs no explanation. This style of apparatus is, however, not very durable, because of the slight, though perceptible, evaporation of the P., which causes a deposit of phosphoric acid to form on the inside of the tin can. This acid deposit slowly corrodes the tinned iron, and causes, after about three months of continuous operation, the formation of holes in the sides of the can. Through these holes an excessive amount of air is liable to enter the apparatus and cause the melting of the P.

II.

For the construction of a continuous and transparent oxidizing chamber a thick bottle, preferably one of white and very clear glass,

is selected, and the bottom very carefully cut off. (This cutting or cracking is best done by means of specially prepared carbon pencils made of powdered charcoal, saltpeter and tragacanth.) A common unglazed flower-pot, the largest that will go into the bottle, is inserted into the open bottle, so that the bottom of the flower-pot is directly over and in contact with the neck of the bottle. A funnel, the conical part of which is at least one inch shorter than the flower-pot, is then inserted in such a way that the funnel-tube passes through the bottom of the flower-pot and the neck of the bottle. Into the neck of the bottle the funnel-tube is securely fastened by means of a perforated rubber stopper or paraffined cork, which must be water-tight. Over the protruding end of the funnel-tube is fastened, by means of a bit of rubber tubing, a piece of glass tube, closed at one end and having a hole on one side. This closed tube is pushed so far over the funnel-tube that the opening in its side is a little above the end of the funnel-tube.

This portion of the apparatus is then placed, neck downwards, over a large glass jar.

Through the centre of the bottom, which was cut off the bottle, a hole of at least five-eighths of an inch in diameter is drilled. The bottom is then put into its original position on the bottle and fastened by glueing strips of paper over the joint. The hole which was drilled through the bottom is loosely closed by a paraffined cork, through which passes a thermometer.

When the oxidizing chamber is thus completed, the cork is removed, and by means of a funnel, having a long bent tube, water poured into the space between the walls of the bottle and the flower-pot, until its level is within a short distance from the upper edge of the funnel within the flower-pot. A few Cubic-centimeters of water are also poured into the funnel until the water in the closed glass-tube, which is attached to the end of the funnel-tube, reaches a little over the end of the funnel-tube.

Then a tube connected with a carbonic acid generator is inserted into the hole and carbonic acid gas passed into the oxidizing chamber. When the air within has been entirely displaced by the gas, sticks of P. are dropped through the hole into the funnel, until the latter is nearly filled. The thermometer and cork are then placed into position and the apparatus allowed to stand for a few hours. Then some notches are cut lengthwise into the cork and the apparatus again left undisturbed for about 24 hours. If at the end of this time the temperature of the P. is below 35°C. , a little more ventilation may be given by enlarging the notches in the cork. Whenever it is seen that the P. is nearly consumed or the water evaporated, a fresh supply is added through the hole without taking the apparatus apart.

The flower-pot in this apparatus performs the same function as it fulfilled in the former (1), by the cloth lining, namely, that of absorbing the water and moistening the air. The closed glass tube which is attached to the funnel prevents the access of air from below to the P. in the oxidizing chamber.

The acid that is formed runs down the funnel into the closed glass tube, and thence through the lateral opening into the glass jar, which serves as receiver.

III.

A still simpler form of a continuous oxidizing chamber I have constructed in the following manner: Through the bottom of a tin pan a hole of about one inch in diameter is cut, and a tube of tinned iron about half-inch long soldered into it. By means of a perforated cork a funnel is fastened into this hole so that the funnel-tube passes through the bottom, while the body of the funnel is inside of the tin pan. Into the end of the funnel-tube is inserted and fastened by a bit of rubber tubing a glass tube bent in a half circle. A common unglazed flower-pot is inverted over the body of the funnel and a paraffined cork with a thermometer inserted into the hole, which is in the bottom of the flower-pot. The whole apparatus is then placed over a glass jar and some water poured into the tin pan.

The tin pan may advantageously be displaced by a wooden water bucket, whereby the apparatus becomes almost indestructible.

After the pouring of a few drops of water into the funnel, whereby the bend of the glass tube is closed against a downward escape of gas, the apparatus is either filled with carbonic acid gas in the manner described under (2), or the oxygen is simply removed therefrom by burning P. in the interior. For this latter purpose a small iron deflagrating spoon, which will pass through the hole in the flower-pot, is employed. A bit of P. is laid into the spoon, ignited and quickly inserted into the flower-pot immediately closed by means of a cork. The apparatus is left undisturbed for a short time, until the air within has cooled to the normal temperature. The introduction of burning P. is then once more repeated, and after cooling the apparatus charged with P. through the hole in the flower-pot.

The further manipulations and precautions are the same as have been given in the description of style (II).

The rate at which the P. is oxidized by my method is a comparatively slow one. In an apparatus of style I., in which the temperature was kept on an average eleven degrees higher than that of the surrounding air, and the P., which was in the form of a solid cake of nearly five inches in diameter, exposed a surface of about 18 square inches, the P. was oxidized at the rate of about 10 Grams a day. The difference between the inner and outer temperature does not seem to be affected to any extent by an increase or decrease of the prevailing temperature; for nearly 200 observations which were taken at temperatures of the atmosphere ranging from 10 to 22° C., gave, while all other conditions remained equal, an almost constant difference.

The acid which collects in the receivers has a specific gravity of 1.48 to 1.5, and is composed mainly of phosphorus and phosphoric acids in the proportion of 1 to 4, besides water. The exact

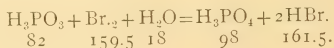
composition differs with circumstances, and the determination of those circumstances may be the subject of some future paper.

The further treatment of this acid is in every respect the same as has already been described under Prof. Wenzell's process; but an acid prepared by my method has this great advantage over the one prepared by the former process, that it is already highly concentrated, and requires very little evaporation before the arsenious acid is reduced.

The oxidation of phosphorus acid to phosphoric acid by means of Bromine. Bromhydric acid by product.

The product of the slow aerial oxidation of Phosphorus contains about 1 molecule of phosphorous acid to 4 molecules of phosphoric acid, and besides these some impurities, such as arsenious acid and others, mostly derived from the phosphorus. Of these impurities the arsenious acid is particularly objectionable and must be removed before the process of oxidizing is entered upon. The removal of the Arsenic, as has been described in my article on "The manufacture of phosphoric acid from Phosphorus," is best effected by heating this acid to 190° C., subsequent diluting and filtering, after which the acid is ready to be oxidized. Heretofore nitric acid has been the only substance employed for this purpose, but since the price of Br. has become so low (about 35c. per lb. in 5lb. bottles) that it cost no longer is prohibitory to its employment in the industries, and furthermore since the value of hydrobromic acid has been recognized both in analytical chemistry as well as in therapeutics,—it may prove advantageous to substitute Br. for nitric acid in the oxidation of phosphorus to phosphoric acid.

From the equation



it will be seen that it requires nearly 2 parts of Br. to every 1 part of phosphorous acid. But the total acidity of the mixture of phosphorous and phosphoric acids, when of a sp. gr. of 1.48 is about 66 per cent., the composition of which approximates the proportion of 1 molecule (or 12%) of H_3PO_3 to 4 molecules (or 54%) H_3PO_4 . To convert the 12 per cent. of phosphorous acid into phosphoric acid would require theoretically $2 \times 12 = 24$ per cent. of Br. This result agrees very closely with that obtained in practice where it was found that with an acid of a sp. gr. of about 1.48 there was needed a little over one-fourth of its weight of Br. to complete its oxidation. This operation may be performed, after the Arsenic has been removed, either in a bottle containing the acid and Br. by shaking this mixture from time to time (it must however not be shaken too often nor too much at one time, since a considerable amount of heat is liberated by the reaction, which may easily reach the boiling point of Br.—65° C.), or it may be accomplished more rapidly by pouring the two substances into a retort and keeping the mixture agitated by slowly passing air through.

In order to prevent any Br. vapor, which is carried off by the air, from contaminating the atmosphere of the laboratory, I caused the air, which escaped from the retort, to pass through two bottles containing a solution of caustic potash. When the mixture is no longer decolorized on standing for about 24 hours, but retains a permanent orange color, which is due to an access of Br., the oxidation may be considered completed. The excess of Br., is best removed by the addition of a small portion of the unoxidized mixture of acids, which has been reserved for this purpose.

A still better plan by which the liability of introducing a large excess of Br. into the acid is avoided, but which requires a little longer time than the one related last, consists in pouring the acid to be oxidized into a large wide-mouth glass-stoppered bottle and the Br. into another but smaller glass-stoppered bottle, which will go into the larger one. After the open bottle with Br. has been inserted into the bottle with acids and the latter closed, the Br. gradually evaporates and oxidizes through its vapor, which is absorbed by the acids, the phosphorous to phosphoric acid. When the interior temperature of the apparatus is kept below 25°C. the acids do not consume the Br. as rapidly as it evaporates and therefore are under these conditions always: dark-orange colored, unless the supply of Br. vapor is shut off by closing the Br. bottle, whereupon the color of the acids disappears within 24 hours.

But when the apparatus is kept in a moderately warm place, where the temperature is 25° C. or over, the reducing power of the phosphorous acid is so much increased that the mixture of acids remains colorless, or acquires only a light orange color so long as any phosphorous acid is left unoxidized. But as soon as this acid has disappeared, the liquid assumes a dark orange color, when the bottle with Br. is to be lifted out, closed and kept for the next operation.

There remains then only the separation of the bromhydric acid from the phosphoric acid, which is accomplished by distillation in a retort from an oil bath. The precautions which have been pointed out in a previous article on the manufacture of bromhydric acid in regard to its liability to decomposition by organic substances, have to be observed here. The mere insertion of the neck of the retort into a well-cooled receiver is sufficient. Neither luting nor rubber connections are necessary. The first portion which comes over consists principally of water (and Br., if this has not been removed in the manner stated above), and should be withdrawn, before the bromhydric acid, which does not evaporate to any great extent until a temperature of about 125° C. has been reached, begins to distill. The distillation is continued until a temperature of about 180° C. is reached, when the fire is extinguished and the receiver with bromhydric acid detached. The retort and its contents are allowed to stand till cold, when a quantity of water equal to about one-third of the bulk of the contents is poured into the retort. Heat is then again applied and the distillation continued until the temperature within the retort has reached the same height as before. This second

distillation serves to remove a portion of bromhydric acid, which cannot be removed in the first distillation.

The phosphoric acid, which forms the residue in the retort, is a black syrupy liquid, which, however, after dilution with water, digestion with about one-half per cent. of purified animal charcoal and subsequent filtration through white filtering paper (best, the brand known as "Chlorine paper") becomes perfectly colorless.

The black color of the phosphoric acid is due to an organic impurity of the commercial Br., which, it is said, is derived from the luting of the stills, in the composition of which tar is used.

The bromhydric acid which has distilled over, requires to be redistilled before it can be considered sufficiently pure for pharmaceutical purposes.

If the addition of Br. is made to an acid, from which the arsenic has not been removed, the entire amount of arsenic will distill over with the bromhydric acid, while the phosphoric acid will be found free from arsenic.

43. Acidum Phosphoricum Dilutum.

Diluted Phosphoric Acid.

The United States 1880 formula is as follows:

Phosphoric Acid (50 per cent.), 2 parts or 1541 grains.

Distilled Water, . . . 8 parts or q. s. to make a pint.

Mix, and keep in a cool place.

This contains 10 per cent. of real acid.

The 1885 British Pharmacopœia directs

Concentrated Phosphoric Acid, Br. P., . . . 3 fl.ounces.

Distilled Water, sufficient to make, . . . 20 fl.ounces.

Mix.

This contains 13.8 per cent. of real acid H_3PO_4 , or 10 per cent. of phosphoric anhydride P_2O_5 .

Diluted phosphoric acid is much used as an invigorator and vitalizer for nervous debility, sexual weakness, etc.

The dose is from 10 to 30 minims or more.

"*Acid phosphate*" is a solution of mineral phosphates in phosphoric or diluted phosphoric acid. See Solutions and Standard Remedies.

44. **Acidum Sulphuricum.***Sulphuric Acid.*

The C. P. sulphuric acid of commerce corresponds to the requirements of the Pharmacopœias which direct it to contain 96 to 98 per cent. of real acid H_2SO_4 . It is prepared by manufacturing chemists.

Haller's Acid Drops (*Acidus Liquor Halleri*) is a mixture of equal weights of sulphuric acid and alcohol. They should be mixed by adding the acid slowly and gradually to the alcohol.

45. **Acidum Sulphuricum Aromaticum.***Aromatic Sulphuric Acid. (Elixir of Vitriol.)*

Although this preparation more properly belongs among the tinctures it is classed by the pharmacopœias with the acids, and, is, therefore, given here.

The United States 1870 formula contained about 14 per cent. of acid (1305 grains), and was made aromatic by ginger (203 grains), and cinnamon (327 grains) in powder, with alcohol enough to make a pint.

The 1880 formula directs about 20 per cent. of acid, and substitutes tincture of ginger and oil of cinnamon for the powders.

Here is the formula :

Sulphuric Acid, by weight,	1392 grains.
Tincture of Ginger,	378 minims.
Oil of Cinnamon,	7 minims.
Alcohol, sufficient to make	a pint.

Add the acid slowly to 8 ounces of alcohol, then add the tincture and oil and enough alcohol to make the measure a pint.

The 1885 British formula contains only 12.5 per cent. of real acid. It is composed of 1 fl.ounce each, strong tincture of ginger and spirit of cinnamon, $1\frac{1}{2}$ fl.ounce sulphuric acid, and 18 fl.ounces of rectified spirit.

Aromatic sulphuric acid is an acid tonic and astringent used for hemorrhage, night sweats, etc.

The dose of the United States preparation is from 5 to 20 minims diluted with water.

46. Acidum Sulphuricum Dilutum.

Diluted Sulphuric Acid.

The United States official preparation is as follows:

Sulphuric Acid, . . . 1 part or 779 grains.

Distilled Water, . . . 9 parts or q. s. to make a pint.

Mix, by adding the acid gradually to the water. This contains 10 per cent. of real acid.

The British 1885 official formula directs

Sulphuric Acid, 1350 grains.

Distilled Water, sufficient to

make 20 fl.ounces, Imperial.

Mix, by adding the acid gradually to the water. This contains 13.65 per cent. of real acid, being about a third stronger than the United States preparation.

The German official is 1 part acid to 5 of water.

Diluted sulphuric acid is the most used of any of the dilute acids. It is employed as an acid tonic and a solvent for quinine and other salts.

The dose is from 5 to 40 minims, in water.

47. Acidum Sulphurosum.

Sulphurous Acid.

The United States preparation is made by adding

Sulphuric Acid, 7 parts.

To Charcoal, 1 part.

And distilling into Distilled Water, . . . 50 parts.

Until the water has absorbed $3\frac{1}{2}$ per cent. of sulphurous acid gas.

The 1885 British formula directs the preparation to contain 6.4 per cent. of real sulphurous acid H_2SO_3 .

It is used externally in some forms of skin diseases, and internally as a germicide in zymotic diseases, etc.

The dose is from $\frac{1}{2}$ to 1 fl.drachm.

48. **Acidum Valerianicum.**

Valerianic Acid.

This is prepared from valerian, or artificially from fousel oil and chromic acid, and is chiefly used for making valerianates.

ADEPS — LARD.

The name *lard* is applied commercially to the rendered fat of the hog, *Sus scrofa*. In pharmacy the term is intended to apply only to lard *purified* by washing with water, melting and straining. The U. S. Pharmacopœia designates this simply by the name *adeps*, or lard, but the Br. Ph. more properly terms it *adeps præparatus*, or prepared lard.

Since the introduction of Petrolatum and Lanolin the use of lard as an ointment base has very much decreased, and much controversy has arisen as to which is the most valuable for this purpose. It has been shown that, although petrolatum ointments do not become rancid, they are not so readily absorbed as those made with lard, and that the reactions which are desired in some of them do not take place when petrolatum is substituted for lard. Lard is still retained as the ointment-base of the pharmacopœias, but will no doubt be gradually replaced by some more suitable vehicle.

The medicinal preparations in which lard is used will be found under the headings Cerata, Unguenta, etc.

49. **Adeps Præparatus.**

Prepared Lard — Washed Lard.

The usual method of washing lard is to spread it on a stone or earthenware slab, and allow a small stream of water to trickle over it, at the same time working it well with a spatula or other convenient mixer. After a thorough washing in this way it is melted and strained.

We suggest the following method, which will be found more convenient and will secure better results:

Melt the lard and pour it into any convenient bottle that will hold three times the quantity desired to be washed. Fill the bottle nearly full of hot water, and while the mixture is cooling agitate it frequently; by this means the lard is granulated or reduced to small fragments. When cool, pour off the water and add fresh cold water to the granulated lard; agitate, pour off the water, add fresh cold water again, and so continue until the lard is thoroughly washed, when it may be melted by water-bath and strained into earthen pots. By adding a fl.drachm of Tincture of Benzoin to each pound of the lard when melted previous to straining it will keep unchanged.

Prepared lard is used for making benzoinated lard, simple cerate, simple ointment and some other cerates and ointments, therefore it may be said to be the base of the officinal ointments and cerates. It is to be regretted, however, that it is so seldom used when directed, the majority of druggists, either through ignorance or neglect, using unwashed lard instead and then wondering why their ointments so soon become rancid. Besides its use in medicinal preparations, washed lard is extensively employed in Continental Europe, for absorbing the odors of flowers. Flower "pomades" are made by spreading layers of flowers on a thin stratum of washed lard, and renewing them as often as the odor of the flowers is well absorbed. From 24 to 30 layers of flowers are thus used before the washed lard is thoroughly saturated with the perfume. The process is called *enfleurage*, and the pomades made by the process are known as No. 24 or No. 30 pomades—the numbers indicating the number of times fresh flowers have been supplied to the lard during the process.

50. Adeps Benzoinatus.

Benzoinated Lard—Benzoinated Ointment.

Benzoin, in coarse powder, . 2 parts or 140 grains.

Prepared Lard, 100 parts or 1 pound.

Melt the lard by heat not exceeding 140° F., add the benzoin and macerate with frequent stirring for two hours,

then strain to remove the particles of benzoin. This will keep unchanged for any length of time, and is therefore mainly used as an ointment base, and for general pharmaceutical purposes when lard is desired. The odorous balsam of the benzoin is dissolved by the lard, and acts as a preservative.

The 1870 U. S. P. directed tincture of benzoin to be used instead of the powder, but it has been found objectionable because of the irritation which is produced when the lard thus prepared is applied.

ÆTHERA — ETHERS.

Ethers are volatile liquids, which, from their property of rapid evaporation have derived their name Ether (air). They are chemically oxides of alcohol radicals, made by mixing acids with alcohols, etc., and distilling over the lighter portions. They are mostly inflammable, and of low specific gravity.

The name *Ether* is applied in pharmacy only to the variety known commercially as sulphuric ether, and chemically as ethyl oxide; other ethers are known commercially by the names of the acids with which the alcohol radical is combined, as acetic ether, nitrous ether, or chemically by the names of the acid and alcohol radical, as amyl acetate, ethyl nitrite, etc. Some substances are termed ethers which are not properly so classed, as petroleum ethers, while others which are properly ethers do not bear the name, as nitrite of amyl, etc.

Ethers require conveniences for making not generally at hand except in chemical laboratories, and are therefore usually supplied by manufacturing chemists.

The ethers chiefly used in pharmacy are derived from the amyl and ethyl radicals. The amyl ethers are mainly used for making artificial fruit and liquor flavors; and the ethyl ethers are chiefly used in medicine. Besides these, ethers are made from Methyl, Propyl, Butyl, Caproyl, and some other alcohol radicals. They are chiefly used in making artificial fruit flavors. Nearly all acids may be combined with these radicals to form ethers, the combination being the same chemically as when acids unite with other bases to form salts,

except that the ethers are always gaseous or liquid, and are separated by distillation.

Under this heading will be considered the preparations which are official or well known commercially as ethers, and a few ethereal preparations not otherwise classified; other ethereal preparations will be mentioned under the headings in which they properly belong.

Ethyl Ethers.—Various acids combine with ordinary (Ethyl) Alcohol (C_2H_5HO) to form a variety of Ethers. Several of these are used in medicine and in making medicinal preparations; while some of them are used to prepare artificial fruit and liquor flavors.

The following list includes most of the Ethyl Ethers that are used. They are known commercially as Ethers:

Ethyl Acetate.....	$C_2H_5C_2H_3O_2$	Acetic Ether.
Ethyl Benzoate.....	$C_2H_5C_7H_5O$	Benzoic Ether.
Ethyl Bromide.....	C_2H_5Br .	Hydrobromic Ether.
Ethyl Butyrate.....	$C_2H_5C_4H_7O_2$	Butyric Ether.
Ethyl Chloride.....	C_2H_5Cl .	Hydrochloric Ether.
Ethyl Formiate.....	$C_2H_5CHO_2$	Formic Ether.
Ethyl Iodide.....	C_2H_5I	Hydriodic Ether.
Ethyl Nitrite.....	$C_2H_5NO_2$	Nitrous Ether.
Ethyl Oxide.....	$(C_2H_5)_2O$	Sulphuric Ether.
Ethyl Pelargonate.....	$C_2H_5C_9H_{17}O_2$	Pelargonic Ether.
Ethyl (Enanthylate).....	$C_2H_5C_7H_{13}O_2$	(Enanthic Ether.
Ethyl Sebacate.....	$C_2H_5C_{10}H_{18}O_2$	Sebacic Ether.

Of the foregoing Butyric Ether resembles pineapple in flavor, and is often called Pineapple Oil. (Enanthic Ether resembles the greengage or plum in flavor, Pelargonic Ether the quince, and Sebacic Ether the melon.

51.

Æther.

Æther—Sulphuric Ether—Ethyl Oxide.



This is prepared by mixing sulphuric acid and alcohol gradually in a retort, distilling over the lighter portions, and purifying the distillate by shaking with a solution of chloride of calcium and slacked lime.

The U. S. P. describes under the name of *Æther* a liquid composed of 74 per cent. of ethyl oxide and 26 per cent. of alcohol, containing a little water, sp. gr. 0.750, and under the

name of *Stronger Ether*, a liquid containing 94 per cent. of ethyl oxide and 6 per cent. of alcohol, sp. gr. 0.725. The former is known commercially as sulphuric ether or common ether, while the latter is known as concentrated ether. The 1885 Br. P. ether contains 92 per cent. of ethyl oxide, which nearly corresponds with the U. S. stronger ether.

Æther Fortier.—*Stronger Ether* is used in medicine as an anæsthetic, by inhalation, and locally in the form of spray for the same purpose; and is given internally, much diluted or combined with other medicines, as an anodyne. It is used in pharmacy for making collodion, oleo-resins, tinctures and other galenicals. Common ether is generally used externally. The dose of stronger ether when administered internally is from 20 to 60 minims, largely diluted.

Purified Ether.—Manufacturing chemists furnish under this name a pure ether for anæsthetic use. The 1885 Br. P. directs such a preparation, calling it *Æther Purus*. It is simply pure oxide of ethyl ($C_2H_5)_2O$, free from alcohol and water.

Washed Ether is a commercial term for Ether of about 0.735 specific gravity, used in the arts. It is also called Letheon.

52.

Æther Aceticus.

Acetic Ether—*Acetate of Ethyl*—*Ethyl Acetate*.



This is prepared by mixing sulphuric acid and alcohol gradually, adding acetate of sodium and distilling, then shaking the distillate with carbonate of potassium and redistilling. Its specific gravity is from 0.889 to 0.897. It is used as a flavoring ingredient in medicinal preparations, and is considerably employed in making artificial fruit flavors.

53.

Æther Hydrobromicus.

Hydrobromic Ether—*Ethyl Bromide*.



This ether is made from bromine and alcohol by the aid of phosphorus, distillation and purification.

It has been somewhat used as an anæsthetic in place of chloroform, but its use has not yet become general. Its action is said to be more rapid and less disagreeable than chloroform.

54. **Æther Hydrochloricus.**

Chloric Ether—Spirit of Chloroform.

Chloride of Ethyl was formerly prescribed under the name of Chloric or Hydrochloric Ether, but has now been supplanted in practice by Spirit of Chloroform, which is made by dissolving one part of Chloroform in nine parts of Alcohol. A similar preparation was formerly sold under the name of Dutch Liquid. It consisted of *Bichloride of Ethylene*, which is isomeric with Chloride of Ethyl.

55. **Æther Nitrosus.**

Nitrous Ether—Nitrite of Ethyl—Ethyl Nitrite.



Preparations bearing the name of *Concentrated Nitrous Ether* and other similar titles, have of late been extensively advertised and sold for the purpose of making Spirit of Nitrous Ether. This ether is the same that is formed in the official process of making Spirit of Nitrous Ether (which see) before the alcohol is added. In this form it has only recently become an article of commerce. It is extremely volatile, and requires to be carefully handled to prevent accident. To make Spirit of Nitrous Ether it has only to be mixed with 19 times its weight of alcohol.

ÆTHEROLÉS OR ETHERATES.

These are simply solutions of various medicinal substances in Ether, the same as Alcoholés or Spirits are solutions of medicinal substances in Alcohol. They are officinal in the French text-books, and are not infrequently prescribed or called for in this country. For other ethereal preparations see Collodion, Oleo-resin, Etherial Tinctures, etc.

56. Etherate of Ammonia.

Water of Ammonia, 22°, by weight, 1 part.

Stronger Ether, by weight, 1 part.

Mix.

This is used as an application for rheumatism, neuralgia, headache, etc.

57. Etherate of Camphor.

Camphor, by weight, 1 part.

Ether (76 per cent.), by weight, 9 parts.

Dissolve the Camphor in the Ether.

This is used as an application for toothache, headache, pain, swelling, etc., and as an anti-spasmodic for convulsions, croup, etc. A saturated solution of Camphor in Ether is also used.

58. Etherate of Cantharides.

Cantharides, in fine powder, 1 part.

Ether, 2 parts.

Mix together and set in a warm place, in a closely-stopped bottle, for 7 days, agitating daily; then pour off the liquid and press the drugs as rapidly as possible to avoid evaporation.

This is used as a vesicant, but has been mostly superseded by Cantharidal Collodion, which see.

59. Etherate of Chloride of Zinc.

Chloride of Zinc, by weight, 15 parts.

Stronger Ether, by weight, 60 parts.

Absolute Alcohol, by weight, 30 parts.

Mix and decant after standing a few hours.

This is given as an anti-spasmodic, in doses of 2 to 4 drops, administered in syrup.

60. Etherate of Phosphorus.

Phosphorus,	1 part.
Spirit or Essence of Peppermint,	12 parts.
Stronger Ether,	150 parts.

Put the Phosphorus with the Essence in a small bottle tightly stopped and warm by water-bath until the phosphorus is melted, agitate constantly while cooling, to divide the phosphorus, then add the Ether and allow to macerate for several days with frequent agitation. This is similar to several tinctures and solutions of Phosphorus, and may be used whenever Phosphorus in a free state is indicated. Dose, 2 minims, on sugar. Two minims represent about $\frac{1}{80}$ grain of Phosphorus. The above is the formula of Lœbelius. Another Ether of Phosphorus is sometimes used, but is an unsafe remedy on account of its strength. It is as follows:

Phosphorus,	1 part.
Stronger Ether,	50 parts.

Macerate with frequent agitation in a small well-stopped bottle for 30 days.

61. Etherate of Sulphur.

Washed Sulphur,	1 part.
Stronger Ether,	10 parts.

Mix, and macerate with frequent agitation for 30 days.

This is given in doses of 2 to 5 minims as a preventive and cure for cholera and other zymotic and septic diseases.

62. Ætherum Oleum, U. S.

Etherial Oil—Heavy Oil of Wine.

“A volatile liquid consisting of equal volumes of Heavy Oil of Wine and Stronger Ether.”

Alcohol, by weight,	24 parts.
Sulphuric Acid, by weight,	54 parts.
Distilled Water, by weight,	1 part.
Stronger Ether, by weight, a sufficient quantity.	

As this is seldom made by druggists we do not repeat the directions for making here, but refer to the U. S. P., page 232. It is generally made and supplied by manufacturing chemists, and is used in medicine only in the preparation of Spiritus *Ætheris Compositus*, or Hoffman's Anodyne.

63. *Æthyleni Bichloridum*—Bichloride of Ethylene—(Dutch Liquid).

This liquid was discovered by Holland chemists in 1795, and was used for a long time as an anodyne and anæsthetic until superseded by ether and chloroform. It is still much called for among the Holland Dutch. Its chemical formula is $C_2H_4Cl_2$. It is used by inhalation, the same as ether, or mixed with twice its weight of alcohol, making a preparation similar to Hoffman's Anodyne, and given in doses of from 10 to 30 minims.

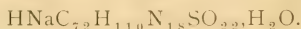
ALBUMEN.

The most common and familiar form of Albumen is the white of egg (*Albumen Ovi*), which is freshly obtained from hen's eggs, or may be had in the market dried in scales or granulated. Another variety is obtained from blood and other animal fluids, and still another is found in the juices and seeds of plants.

White of Egg is the only form of Albumen used in pharmacy. It is also considerably used in the arts for various purposes, as calico printing, making photographic paper, etc. In pharmaceutical preparations the natural white of egg, which contains about $12\frac{1}{2}$ per cent. of Albumen, is generally used, but dried-egg albumen is sometimes employed.

The chemical composition of Albumen has not yet been definitely ascertained. It is the Sphynx of the chemist, and its formula is still written with an interrogation point (?). It has been found, however, to contain Sodium, Sulphur, Nitro-

gen, Hydrogen and (white of egg) about 85 per cent. of water. Gerhardt has given its approximate formula as



Albumen is but little used in medicinal preparations, but might be more frequently employed with advantage. It forms insoluble compounds with salts of mercury, lead and copper, and some other poisonous substances, and is therefore given in large doses in cases of poisoning by these substances. It forms insoluble compounds with tannin and other vegetable astringents, and may be employed with advantage to detannate preparations which it is desirable to combine with iron, etc., as Elixir of Calisaya, etc. It is a valuable nutritive, and is given combined with iron, soda and glycerin in the form of a syrup. (See Syrup Albuminate of Iron.) Its property of coagulating by heat makes it useful for clarifying liquids, syrups, etc. It is used externally in some toilet preparations and liniments, and in many forms combined with wines, etc., as a nutritive drink for invalids.

The combinations of Albumen with medicines are frequently called *nitrogenized* medicines or *protein* compounds.

Albumenoids are substances resembling Albumen in their general character and composition. *Fibrin* is the chief constituent of muscular tissue and is found in solution in the blood. *Casein* is a constituent of milk, and *Legumin* (called vegetable Casein) of leguminous seeds, beans, peas, almonds, etc.

Albuminates are chemical compounds, either soluble or insoluble, of Albumen with other substances. The compounds and mixtures generally used will be found under the headings Glycerites, Syrups, Solutions, etc.

ALCOHOLES—ALCOHOLS.

The general name *Alcohol* is applied to a class of substances which are, chemically, hydrates of a series of Alcohol radicals. In pharmacy, *Alcohol* is the hydrate of Ethyl, and is obtained

by distillation from fermented grains or other substances which contain starch or sugar.

Alcohol Radicals and Primary Alcohols.—In chemistry, the Alcohol radicals constitute a homologous series which increases by CH_2 (one atom of carbon to two of hydrogen). This is known as the $\text{C}_n\text{H}_{2n+1}$ series (n equaling any number). Starting with hydrogen as a base, the radicals are built up by the successive additions of CH_2 .

ALCOHOL RADICALS.

[Hydrogen.....	...H]
Methyl.....	CH_3
Ethyl.....	C_2H_5
Propyl (or Trityl).....	C_3H_7
Butyl (or Tetryl).....	C_4H_9
Amyl.....	C_5H_{11}
Caproyl (or Hexyl).....	C_6H_{13}
Enanthyl (or Heptyl).....	C_7H_{15}
Capryl (or Octyl).....	C_8H_{17}
Nonyl.....	C_9H_{19}

PRIMARY ALCOHOLS.

Methyl (or Wood Alcohol).....	CH_3HO
Ethyl (or common Alcohol).....	$\text{C}_2\text{H}_5\text{HO}$
Propyl Alcohol.....	$\text{C}_3\text{H}_7\text{HO}$
Butyl Alcohol.....	$\text{C}_4\text{H}_9\text{HO}$
Amyl Alcohol.....	$\text{C}_5\text{H}_{11}\text{HO}$
Hexyl Alcohol.....	$\text{C}_6\text{H}_{13}\text{HO}$
Heptyl Alcohol.....	$\text{C}_7\text{H}_{15}\text{HO}$
Octyl Alcohol.....	$\text{C}_8\text{H}_{17}\text{HO}$
Nonyl Alcohol.....	$\text{C}_9\text{H}_{19}\text{HO}$

The foregoing Alcohols are all liquids, their specific gravity increasing with their molecular weight. To these may be added Cetyl Alcohol ($\text{C}_{16}\text{H}_{33}\text{HO}$), Ceryl Alcohol ($\text{C}_{27}\text{H}_{55}\text{HO}$) and Melissyl Alcohol ($\text{C}_{30}\text{H}_{61}\text{HO}$), which are white crystalline solids.

Alcohol radicals are gaseous in their free state. They form hydrides (which are mostly gaseous) with hydrogen; oxides or ethers (mostly liquid) with oxygen; hydrates with hydrogen and oxygen; aldehyds by the loss of hydrogen; and acids by combining one equivalent of oxygen with the aldehyds. The following table shows the changes that occur:

RADICALS (FREE).	Hydrides.	Oxides (Ethers).	Hydrates (Alcohols).	Aldehyds	Acids.
Methyl (CH_3) ₂	CH_3H	$(\text{CH}_3)_2\text{O}$	CH_3HO	CH_2O	CH_2O_2
Ethyl (C_2H_5) ₂	$\text{C}_2\text{H}_5\text{H}$	$(\text{C}_2\text{H}_5)_2\text{O}$	$\text{C}_2\text{H}_5\text{HO}$	$\text{C}_2\text{H}_4\text{O}$	$\text{C}_2\text{H}_4\text{O}_2$
Propyl (C_3H_7) ₂	$\text{C}_3\text{H}_7\text{H}$	$(\text{C}_3\text{H}_7)_2\text{O}$	$\text{C}_3\text{H}_7\text{HO}$	$\text{C}_3\text{H}_6\text{O}$	$\text{C}_3\text{H}_6\text{O}_2$
Butyl (C_4H_9) ₂	$\text{C}_4\text{H}_9\text{H}$	$(\text{C}_4\text{H}_9)_2\text{O}$	$\text{C}_4\text{H}_9\text{HO}$	$\text{C}_4\text{H}_8\text{O}$	$\text{C}_4\text{H}_8\text{O}_2$
Amyl (C_5H_{11}) ₂	$\text{C}_5\text{H}_{11}\text{H}$	$(\text{C}_5\text{H}_{11})_2\text{O}$	$\text{C}_5\text{H}_{11}\text{HO}$	$\text{C}_5\text{H}_{10}\text{O}$	$\text{C}_5\text{H}_{10}\text{O}_2$
Caproyl (C_6H_{13}) ₂	$\text{C}_6\text{H}_{13}\text{H}$	$(\text{C}_6\text{H}_{13})_2\text{O}$	$\text{C}_6\text{H}_{13}\text{HO}$	$\text{C}_6\text{H}_{12}\text{O}$	$\text{C}_6\text{H}_{12}\text{O}_2$
Etc.	Etc.	Etc.	Etc.	Etc.	Etc.

Besides the above-mentioned primary Alcohols, many other substances, which have the same elements in different combinations, are grouped with Alcohols, as Glycerin or Glyceric

Alcohol ($C_3H_5(HO)_3$), the Alcohols of the phenol series of which carbolic acid is a well-known member, and many other less familiar substances.

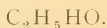
Commercially, only two kinds of Alcohol are known in this country, namely, grain Alcohol (Ethyl Alcohol), which is known simply by the name "Alcohol," and wood Alcohol (Methyl Alcohol), which is usually known by that name, but is also sold under the proprietary title *Alcoline*. Methylated Spirit is sold in Great Britain for manufacturing purposes, without tax. It is composed of 9 parts of alcohol and 1 part of wood alcohol, making it unfit for use as a beverage.

In the U. S. and German Pharmacopœias Alcohol (Ethyl Alcohol) only is mentioned. The 1885 Br. P. recognizes Amyl Alcohol and Ethyl Alcohol; but, commercially, Amyl Alcohol is known as *fusel* or *fousel* oil.

64.

Alcohol.

Ethyl Alcohol—Ethyl Hydrate.



The present U. S. P. describes Alcohol as "a liquid composed of 91 per cent. by weight (94 per cent. by volume) of Ethyl Alcohol, and 9 per cent. by weight (6 per cent. by volume) of water, sp. gr. 0.820 at 15.6° C. (60° F.)" It boils at 78° C. (172.4° F.).

The commercial Alcohol (188° proof), which is furnished by the distillers in this country, corresponds very closely with this description.

The U. S. P. designates it simply by the name "ALCOHOL," while the Br. P. terms it ALCOHOL ETHYLICUM—*Ethyl Alcohol*, which seems the more proper name, as it distinguishes it from other Alcohols. Alcohol is chemically *Hydrate of Ethyl*. It is composed of

Carbon,	52.67 parts, by weight.
Hydrogen,	12.90 parts, by weight.
Oxygen,	34.43 parts, by weight.

100.

It is obtained by distillation from fermented grain, fruit or other substances composed largely of starch or sugar. In this

country Alcohol is principally made from common whisky, by redistillation. When grain is used for making Alcohol or spirits a portion of it is malted for the purpose of developing the *diastase*. The coarsely-ground unmalted grain is then scalded to soften the starchy matter, the malt is added, which converts the starch, first, into dextrin, and then into saccharine matter. It is then cooled, yeast is added, and the vinous fermentation begins, converting the saccharine matter into Alcohol and liberating carbonic acid gas. When fermentation has proceeded long enough the mash is put into stills, and the Alcohol in a weak form (whisky) is obtained. It is then redistilled to obtain the Alcohol of commerce.

When Alcohol is made from fruit or saccharine matter the process begins with the vinous fermentation. Alcohol is the spirit or "spirits" present in wines, beer, cider and all still malt and distilled liquors; its varying proportion determines the strength of the liquors.

Absolute Alcohol is Alcohol containing not more than one or two per cent. of water. It is made from ordinary Alcohol by agitating with carbonate of potassium and fused chloride of calcium, or with slacked lime (which absorbs the water) and redistilling. Its sp. gr. is 0.794 to 0.800. It is sometimes called Attwood's Patent Alcohol.

Stronger Alcohol.—This was directed in the U. S., 1870, Pharmacopœia, but was not retained in the later revision. Its sp. gr. was 0.817, and it was stronger than the commercial Alcohol, so it was very properly deleted.

Rectified Spirit—*Spiritus Rectificatus*—Br. P.—"Alcohol, with sixteen per cent. of water, obtained by the distillation of fermented saccharine fluids."

This is the Alcohol chiefly directed to be used in the preparations of the Br. P. It corresponds very nearly with the 1870 U. S. official Alcohol — its sp. gr. is 0.838, while the sp. gr. of the 1870 U. S. Alcohol was 0.835 and contained 15 per cent. of water.

To convert the U. S. 1880 or commercial Alcohol into rectified spirit of the British standard, add 1 fluidounce of water to 16 fl.ounces of Alcohol. This should be observed when working formulæ of the Br. P.

The abbreviation S. V. R., *Spiritus Vini Rectificatus*, so frequently met with in English formulas, refers to rectified spirit, which was formerly called *Rectified Spirit of Wine*.

Spiritus—*Weingist*, P. G.—The Alcohol of the German Pharmacopœia contains 85.6 to 87.2 per cent. of absolute Alcohol and has sp. gr. 0.830 to 0.834. It is, therefore, a trifle stronger than rectified spirit.

Cologne Spirit.—In this country this is *deodorized Alcohol*, of the same proof as official Alcohol. In France, Cologne spirit is distilled from grapes, and is of about the same proof as Alcohol. When this is desired it is usually called French Cologne spirit. The high duty prevents its use to any extent in this country.

Pure Spirit is a commercial name for deodorized spirit of about 100° proof, which corresponds very nearly with diluted Alcohol. It is similar to but only about half the alcoholic strength of Cologne spirit, and is largely used by rectifiers of liquors and manufacturers of wines for mixing. It is also called *neutral spirit*.

Spirit of Wine is a commercial name for Alcohol, although it properly applies to the French Cologne spirit. It is frequently called for in old recipes, and Alcohol should be dispensed.

High Wine is a name used by distillers for low-proof Alcohol. When called for, ordinary Alcohol may be used.

Proof of Alcohol.—In this country liquors which contain one half, or 50 per cent., by measure of absolute Alcohol are called PROOF, or 100°. If they contain more than that they are called above or over proof, and, if less, below proof, the proof being shown by adding to or subtracting from 100; thus, whisky, gin, rum and brandy are generally proof, or 100°. If five over proof, they would be called five above or over proof, or 105°, and, if ten less than proof, ten below proof, or 90°. Commercial Alcohol is 188°, or 88° over proof, or 94 per cent. (the percentage of Alcohol by measure always being one half the proof degrees).

To reduce official or commercial Alcohol to any desired percentage of Alcohol, divide its per cent. (91) by the percentage

required, and subtract 1 from the quotient. This gives the number of parts, by weight, of water to be added to one part, by weight, of Alcohol. If volume per cent. is required, divide the volume per cent. of official Alcohol (94) by the required percentage by volume and subtract 1 from the quotient.

For example, supposing 75 per cent. Alcohol, by weight, is required :

$$\begin{array}{r} 75)91(1.21 \\ \underline{75} \\ 160 \\ \underline{150} \\ 100 \\ \underline{75} \end{array}$$

Subtract 1 from the quotient.

1.21

1

.21

about $\frac{1}{5}$ of water, or 1 ounce to 5, by weight, to be added.

Relation of Weight to Volume.—The change in the U. S. P. of 1880 to parts by weight, instead of fluid measure, makes it necessary to thoroughly understand the relation between the weight and measure of Alcohol. It is clearly shown in the following tables :

TABLE OF MEASURE, WITH WEIGHT EQUIVALENTS OF ALCOHOL, SP. GR. 0.820 AT 15.6° C. (60° F.).*

FLUID MEASURE.	In Troy Grains.	In Troy Ounces.	In Avoir. Ounces.	In Metric Grammes.
AMERICAN (APOTHECARY).				
<i>Fluid Measure.</i>				
1 Minim weighs.....	0.78	0.0016	0.0018	0.0505
1 Fluidrachm weighs.....	46.7	0.097	0.107	3.029
1 Fluidounce weighs.....	373.7	0.779	0.854	24.230
1 Pint (16 fl.ounces) weighs.....	5978.8	12.462	13.674	387.680
BRITISH (IMPERIAL).				
<i>Fluid Measure.</i>				
1 Minim weighs.....	0.75	0.0015	0.0017	0.0484
1 Fluidrachm weighs.....	44.8	0.093	0.102	2.908
1 Fluidounce weighs.....	358.	0.748	0.820	23.246
1 Pint (20 fl.ounces) weighs.....	7175.0	14.948	16.400	464.937
METRIC FLUID MEASURE.				
1 Cubic centimetre weighs.....	12.4	0.026	0.028	0.807
1 Litre weighs.....	12455.0	25.949	28.554	807.126

*Alcohol increases or decreases in volume, about $\frac{1}{1850}$ for each Fahrenheit degree of temperature between 50° and 75°.

TABLE OF WEIGHT, WITH MEASURE EQUIVALENTS OF
ALCOHOL, SP. GR. 0.820 AT 15.6° C. (60 F.).

WEIGHT.	In Ameri- can Minims.	American (Apotheca- ry) Fluid- Ounces.	British (Imperial) Fl.ounces.	Metric Cubic Centim'es.
APOTHECARY WEIGHT.				
1 Grain measures.....	1.28	0.0027	0.0028	0.0812
1 Drachm measures.....	77.1	0.160	0.167	4.899
1 Ounce (troy) measures.....	616.6	1.284	1.340	39.194
AVOIRDUPOIS WEIGHT.				
1 Ounce measures.....	562.0	1.171	1.219	35.112
1 Pound (16 ozs.) measures.....	8992.0	15.732	19.512	561.792
METRIC WEIGHT.				
1 Gramme measures.....	19.8	0.0421	0.0428	1.242

Alcohol is used in pharmacy as a solvent and preservative for the medicinal properties of drugs. It is used in the preparation of medicines more frequently than any other substance. It is much employed in the arts for various purposes. It is largely used in medicine as a stimulant, and in fact seems to be essential, in some form, to all people, in all countries, and in every avenue of life.

65. Alcohol Dilutum.

*Diluted Alcohol, U. S., Spiritus Tenuior or Proof Spirit Br.
Spiritus Dilutus, P. G.*

The present U. S. P. directs diluted Alcohol to be made by mixing equal weight of official Alcohol and water. It is described as "a liquid composed of 45.5 per cent. by weight (53 per cent. by volume) of Ethyl Alcohol, and 54.5 per cent. by weight (47 per cent. by volume) of water. Sp. gr. 0.928, at 15.6° C. (60° F.)." It is made as follows:

DILUTED ALCOHOL, U. S. 1880.

	BY WEIGHT.	BY MEASURE.
Alcohol, sp. gr. .820,	50 parts or 16 ozs. av.,	17 fl.ozs.
Distilled Water,	50 parts or 16 ozs. av.,	14 fl.ozs.

Mix. Sp. gr. 0.928, percentage of Ethyl Alcohol, by weight 45.5, by volume 53.

The 1870 U. S. diluted Alcohol was made as follows:

DILUTED ALCOHOL, U. S. 1870.

Alcohol, sp. gr. 0.835,	{ equal parts }	a pint.
Distilled Water, . . .	{ by measure, }	a pint.

Mix. Sp. gr. 0.941, percentage of Ethyl Alcohol, by weight 39.3, by volume 46.6.

It will be observed that the present U. S. diluted Alcohol is considerably stronger than the 1870. While it is desirable to have a preparation of sufficient alcoholic strength for the purpose, yet the 1880 diluted Alcohol seems unnecessarily strong for making most of the preparations in which it is employed, in fact, a much weaker menstruum could be as well used in most of them. Druggists, by the usage of a century, have made diluted Alcohol, by mixing equal measures of commercial Alcohol and water. While this may not be strictly scientific, it is the custom that has prevailed, and we find now, in spite of the directions of the 1880 Pharmacopœia, that the practice is still continued, and that ninety-nine out of one hundred druggists now mix equal volumes of commercial Alcohol and water to make diluted Alcohol. This seems strong enough for all purposes for which diluted Alcohol is used, and we advise its adoption in all the formulas in this work in which diluted Alcohol is directed, except when specially marked U. S. 1880, or U. S. 1870, etc.

DILUTED ALCOHOL, TO BE USED IN THESE FORMULAS.

Commercial Alcohol, .	{ equal parts }	a pint.
Water,	{ by measure, }	a pint.

Mix. It contains about 43 per cent. by weight, or 50 per cent. by volume, of commercial Ethyl Alcohol. Sp. gr. at 72° F., 0.933.

In working the formulæ of the British or German authorities it is sometimes necessary to use the standard for diluted Alcohol adopted by them. We therefore give the formulas:

PROOF SPIRIT (SPIRITUS TENUIOR), BR. 1885.

Rectified Spirit, sp. gr. 0.838,	. . . . .	5 pints.
Distilled Water,	. . . . .	3 pints.

Mix. Sp. gr. 0.920. " It contains by weight about 49

per cent., and by volume about 57 per cent. of absolute Alcohol."

This, it will be seen, is considerably stronger than the U. S. diluted Alcohol.

SPIRITUS DILUTUS (VERDÜNNTER WEINGEIST), P. G.

Alcohol, sp. gr. 0.830, by weight, 7 parts or ozs. av.

Water, by weight, 3 parts or ozs. av.

Mix. Sp. gr. 0.892. It contains by weight about 60 per cent., and by volume about 69 per cent. of absolute Alcohol, making it a fourth stronger than the U. S. official diluted Alcohol.

Relation of Weight to Volume.—The change in the U. S. P. to parts by weight instead of fluid measure makes it necessary to thoroughly understand the relation between the weight and measure of diluted Alcohol. It is clearly shown in the following tables, which are calculated for U. S. 1880 official diluted Alcohol (equal parts *by weight* of Alcohol and water):

TABLE OF MEASURE, WITH WEIGHT EQUIVALENTS OF
DILUTED ALCOHOL, SP. GR. 0.928 AT 15.6 C. (60 F.).*

FLUID MEASURE.	In Troy Grains.	In Troy Ounces.	In Avoir. Ounces.	In Metric Grammes
AMERICAN (APOTHECARY)				
<i>Fluid Measure.</i>				
℥ Minim weighs.	0.88	0.0018	0.0020	0.0571
℥ Fluidrachm weighs.	52.8	0.110	0.121	3.428
℥ Fluidounce weighs.	422.8	0.881	0.966	27.406
℥ Pint (16 fl. ounces) weighs.	6766.2	14.146	15.456	438.496
BRITISH (IMPERIAL)				
<i>Fluid Measure.</i>				
℥ Minim weighs.	0.84	0.0018	0.019	0.0548
℥ Fluidrachm weighs.	50.8	0.108	0.116	3.289
℥ Fluidounce weighs.	406.1	0.846	0.928	26.315
℥ Pint (20 fl. ounces) weighs.	8122.0	16.920	18.562	526.308
METRIC FLUID MEASURE.				
℥ Cubic centimetre weighs.	15.3	0.032	0.035	0.925
℥ Litre weighs.	15347.2	31.973	35.102	925.792

* Diluted Alcohol increases or decreases in volume about $\frac{1}{3710}$ for each Fahrenheit degree of temperature between 50° and 75°.

TABLE OF WEIGHT, WITH MEASURE EQUIVALENTS OF
DILUTED ALCOHOL, SP. GR. 0.928 AT 15.6° C. (60° F.).

WEIGHT.	In Amer- ican Minims.	American (Apotheca- ry) Fluid- ounces.	British (Imperial) Fluid Ounces.	Metric Cubic Centime'rs.
APOTHECARY WEIGHT.				
1 Grain measures.....	1.13	0.0023	0.0024	0.0702
1 Drachm measures.....	68.1	0.142	0.148	4.213
1 Ounce (troy) measures.....	544.8	1.135	1.182	33.702
AVOIRDUPOIS WEIGHT.				
1 Ounce measures.....	495.4	1.046	1.075	30.583
1 Pound (16 oz.) measures.....	7626.8	16.736	17.201	489.328
METRIC WEIGHT.				
1 Gramme measures.....	16.6	0.036	0.038	1.135

When alcohol and water are mixed, a slight contraction of volume occurs with a rise in temperature. The greatest contraction occurs when 52.6 volumes of alcohol are mixed with 47.4 volumes of water, it being 3.4 per cent. This should be taken into account when making specified quantities of diluted alcohol.

Alcohol in Pharmacy.—Alcohol is used in pharmacy to extract or dissolve the properties of drugs and to preserve their solution. No other solvent of medicinal substances has been found of such universal value and application. A large share of the liquid preparations that are used in pharmacy contain Alcohol and depend upon its solvent power and preservative virtue for their value. Besides this, it is used in making most of the solid extracts, abstracts, alkaloids, resins, and many other solid preparations.

The liquid preparations in which Alcohol is used as the solvent of medicinal principles, or for their preservation, may be classified as follows:

Cordials and Elixirs, which contain aromatic substances, and mild medicines, sweetened and combined with sufficient Alcohol to keep them and hold their properties in solution.

Essences and Flavoring Extracts, which are mostly made from essential oils, or aromatic substances dissolved in Alcohol.

Fluid and Liquid Extracts, which contain a large quantity of medicinal value held in solution by Alcohol or diluted Alcohol.

Liquors of all kinds, which are mainly Alcohol in some form, diluted and flavored with the substances peculiar to the kind.

Spirits, which are solutions of essential oils, aromatic substances, etc., in Alcohol, and among which may be included perfumes.

Solutions, which contain Alcohol, either as a solvent or preservative, as solutions of gums, resins, acids, alkaloids, etc.

Tinctures, which are mainly solutions of the medicinal principles of drugs in Alcohol or diluted Alcohol.

To these may be added the abstracts, solid extracts, alkaloids, and medicinal principles of drugs generally, which are obtained by the aid of Alcohol, and it will be seen that in pharmacy it is the most important of any substance, in fact, entirely indispensable in its practice.

In French pharmacy Alcohol is called *Alcool*, and alcoholic preparations are classified according to the manner of preparing them and the substances used in them.

Alcoolats or Alcoholates are medicated distilled spirits, made by macerating aromatic and other substances with Alcohol, and distilling. We have no official preparations that correspond with them. They will be noticed under the headings DISTILLATES, ESSENCES, SPIRITS, TINCTURES, ETC.

Alcoolateures.—These are tinctures prepared by macerating fresh plants (roots, barks, seeds, leaves, flowers, etc.) in Alcohol. They correspond very nearly to what are known in this country as green plant fluid extracts. They are made by macerating equal parts by weight of the fresh substance, properly cut, bruised or divided, in ninety per cent. Alcohol, for ten days, then pouring off the liquid, pressing the drugs, and filtering the extract thus obtained. As our green plant fluid extracts are so similar, these preparations will not be further noticed.

Alcooles.—These are simple solutions of medicinal substances in Alcohol. Among them are the mixtures of acids,

ammonia, etc., with Alcohol and the solutions of alkaloids and their salts, phosphorus, carbonate of potassium, soap, etc., which are not properly classified under the head of "Tinctures Alcoholicques." We have included these under the general heading "Tinctures." Besides the above-mentioned preparations containing Alcohol, are those which are classified the same as in our own works, which will be noticed under their proper headings, as Elixirs, Essences, Extracts, Spirits, Tinctures, etc.

66. Alcohol Amylicum, Br.

Amylic Alcohol—Fousel Oil—Hydrate of Amyl.



This is a "liquid of oily consistence contained in the crude spirit produced by the fermentation of saccharine solutions with yeast, and separated in the rectification or distillation of such crude spirit." It is a hydrate of the radical amyl (C_5H_{11}), and is commercially known as Fusel or Fousel Oil. When pure its sp. gr. is 0.818. It boils at 132°C . (269.6°F .). It is the base of many of the so-called fruit ethers or artificial fruit flavors and of most of the artificial liquor flavors, and is used in medicine for making nitrate of Amyl and valerianate of sodium.

67. Alcohol Methylicum.

Methylic Alcohol—Wood Alcohol—Wood Naphtha—Hydrate of Methyl—Carbinol.



This Alcohol is produced by the destructive distillation of wood, hence it is called Wood Alcohol, pyroxylic spirit or wood naphtha. It is chemically a hydrate of the radical methyl (CH_3); its specific gravity is 0.798; it boils at about 65°C . (149°F .). It is used considerably in making varnishes and many other preparations as a substitute for Alcohol, but on account of its peculiar odor cannot replace Ethyl Alcohol in medicinal preparations, but is considerably used in making some kinds of chemicals, as salicylic acid, etc. It was formerly used for consumption and chronic catarrh; but its internal administration is nearly abandoned.

ALDEHYDES — ALDEHYDS.

Aldehyds are derived from Alcohols by the elimination of H_2 from the hydrates of the Alcohol radicals. Aldehyds corresponding to eleven of the primary Alcohols have been discovered. Although but one is known in pharmacy, namely, *Acetic Aldehyd*, C_2H_4O (from Ethyl Alcohol), and that is seldom used. The chemical composition of several of the aldehyds will be found on page 85.

The aldehyds are intermediate in position between alcohols and acids — the first step in the oxidation (or dehydration) of alcohols, which, when continued, converts them into acids. They unite with ammonia, forming *aldehyd-ammonias*, which by losing H_2O condense into the basic substances *aldines* and *oxaldines*. The aromatic aldehyds, as benzoic, cumic, salicylic, cinnamic, etc., are obtained from essential oils or plants, and when acted upon by ammonia produce *hydramides*.

68.

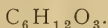
Aldehyd.

Acetic Aldehyd.



Aldehyd is made by mixing three parts of eighty per cent. Alcohol with two parts of nitric acid, distilling, purifying, separating and redistilling. The nitric acid combines with the Alcohol and unites with a portion of its hydrogen to form nitrous ether and aldehyd, which are distilled and treated with ammonia gas. The nitrous ether separates as a layer floating on the solution of ammonia aldehyd, the latter is then mixed with diluted sulphuric acid, and redistilled over chloride of calcium. The sp. gr. of aldehyd is 0.805 at $0^\circ C.$ ($32^\circ F.$). It is antiputrescent, and has properties somewhat similar to ether, but is not used in medicine. Several of its derivatives, however, as chloroform and chloral, are much employed. *Acetals* are compounds made by combining aldehyds and alcohols with elimination of water. *Bromal*, *Iodal*, *Chloral*, and *Butyl Chloral* are derivatives of aldehyd.

69.

Paraldehyd.

This has recently come into use as a hypnotic and anodyne. It contains the same elements in the same proportions as aldehyd, but in triple combination: $\text{C}_6\text{H}_{12}\text{O}_3 = 3\text{C}_2\text{H}_4\text{O}$. It is made by acting upon aldehyd with small quantities of mineral acids or zinc chloride, or by adding a few drops of concentrated sulphuric acid to aldehyd, and subsequent distillation. It is a colorless liquid at ordinary temperature, solid at 50° F., soluble in cold water or elixir. The adult dose is from half to one and one half fluidrachm. It has not yet come into general use, but is thus far very favorably received.

ALKALIES.

Commercially, the hydrate of sodium (caustic soda) and the hydrate of potassium (caustic potassa) only, are known as Alkalies, but in pharmacy the carbonates of these metals and of ammonia, the solution of gaseous ammonia in water (water of ammonia) and, indirectly, the hydrates and carbonates of lithium, barium, calcium, strontium, and magnesium are classed with the Alkalies. In a general way, Alkalies are known as bases, which combine with fatty acids to form soaps or oleates; which combine with acids to form neutral salts; which turn red litmus blue or yellow turmeric brown, and which are in every way the reverse of acids. The manufacture of soda and potassa Alkalies constitutes a great commercial industry. These manufactures are known as alkali-works, and are mostly devoted to the manufacture of Soda Alkali.

The *Soda Ash* of commerce is the impure carbonate of sodium, which is the basis of the Soda Alkali.

Potash or *Pearlash* is impure carbonate of potash, the base of the Potassa Alkali. The Alkalies form the bases of a great variety of chemicals which are used in medicine, and are extensively employed in many important manufacturing industries and in the arts. They are sometimes named from their source

of supply, as ammonia is called *animal alkali*; potassa, *vegetable alkali*; soda, *mineral alkali*; barium, calcium, strontium, and magnesia, *alkaline earths*, etc. The Alkalies and their uses will be further noticed under the headings of the substances which compose them.

ALKALOIDES — ALKALOIDS.

The name Alkaloids is given to a class of organic bases which (like alkalies) combine with acids to form salts. The Alkaloids and their salts represent the active medicinal properties of most vegetable drugs and form a very important class of chemicals. The manufacture of Alkaloids and their salts is chiefly carried on by manufacturing chemists, and a large amount of capital is thus employed.

Alkaloids may be classed as *natural* and *artificial*. The natural Alkaloids are obtained from organic substances (animal or vegetable) in which they exist combined with other substances, and the artificial are produced by the skill of the chemist. The natural Alkaloids all contain nitrogen, with hydrogen as a base, and are probably derivatives of the ammonia type (NH_3). Carbon is present in all, and oxygen in most of them. Alkaloids which contain the four elements C, H, N, O, are called AMIDES. They are generally non-volatile crystallizable solids, representing the active principles of vegetable and animal substances from which they are obtained. Alkaloids which contain only the three elements C, H, N, are called AMINES. They are generally volatile liquids, artificially made by substituting hydrocarbon radicals wholly or partly for the hydrogen of the typical ammonia base.

Considerable confusion formerly existed because of the lack of uniformity of the termination of the names of Alkaloids—some ending with *ia* and some with *ine*, as morphia, quinine, etc., but in the late revisions of the American and British Pharmacopœias the terminal letters of the names of the Alkaloids are uniformly *ine*. It should, therefore, be remembered that in older works of pharmacy the names of Alkaloids that terminated in *ia* would now be written *ine*.

As Alkaloids are, so to speak, the concentrated principles of the substances from which they are derived they are very powerful, compared with the crude substances, the dose of many of them being very minute. Their salts, being more soluble, are mainly used in medicine. Several Alkaloids varying in composition and characteristics are sometimes obtained from one plant, but in the main they are true representatives of the drug in properties and actions.

Alkaloids are generally insoluble or but sparingly soluble in water, but are readily dissolved in alcohol, chloroform, and the liquid hydrocarbons. They form salts with acids, generally soluble in water. From aqueous solutions of these salts the Alkaloids are precipitated by alkalies, because of the stronger attraction of their acids for the alkali than the alkaloidal base.

The Alkaloids are mainly used in pharmacy as bases for preparing their salts, and are but little employed in medicine, their soluble salts being used instead. It is therefore unnecessary to give explicit formulæ for all of them, but only such as are more frequently employed and general processes which may apply to the remainder.

The following general directions for preparing Alkaloids from crude drugs are therefore given, but it may be stated that they can only be considered general directions, and that some special treatment, requiring experience and chemical knowledge is necessary to successfully obtain and separate the Alkaloids of most substances. They are, therefore, generally supplied by competent manufacturing chemists.

70. General Directions for Preparing Alkaloids.

I. FOR ALKALOIDS SLIGHTLY SOLUBLE IN WATER, OR WHICH EXIST IN THE PLANTS, ETC., IN THE FORM OF ACIDS, OR SOLUBLE SALTS OF ALKALOIDS.

Macerate the drug, in coarse powder, twenty-four hours, in water sufficient to cover it, then pack it moderately in the water-bath percolator, adding water freely, and heat to boiling; then begin to percolate, adding water through the percolator, and continuing the heat and percolation until the drug is

exhausted; strain the percolate while hot and slowly add to the liquid water of ammonia or liquor of potassa as long as it continues to precipitate, allow to settle, pour off the liquid, pour the precipitate upon a filter, wash with a little water, press, dissolve in very dilute acetic or hydrochloric acid, precipitate again with ammonia or potassa, pour off, drain, and repeat the operation as many times as may be necessary to purify the Alkaloids. The product is the Alkaloids of the drug, which are partially soluble in water. If necessary, they must be separated by various means, recrystallized and dried. The liquors which are poured off contain a small percentage of the Alkaloids, which may be recovered by evaporating them and treating in the same manner as directed.

II. FOR ALKALOIDS INSOLUBLE IN WATER.

Macerate the drug, in moderately fine powder, for twenty-four hours, with sufficient alcohol to cover it, pack firmly in the water-bath percolator, pour alcohol upon it, heat moderately for an hour and begin to percolate, adding alcohol to the drug and continuing the heat and percolation until its strength is exhausted; distil off most of the alcohol and to the residue add sufficient very dilute acetic or muriatic acid to dissolve the Alkaloids that are in the soft extract; this is best accomplished by washing it with several portions of the dilute acid; filter the acid solution and add to it sufficient water of ammonia or liquor potassa to precipitate the Alkaloids, wash the precipitate on a filter with water, and redissolve and reprecipitate if necessary. The product is the Alkaloids soluble in alcohol that were contained in the drug, and they must be separated if necessary.

Many other processes are employed for obtaining Alkaloids, as boiling the drug with dilute acid, precipitating with an alkali, etc., but the foregoing are sufficient to show the general methods. It may be explained in regard to the foregoing processes that the heat employed serves to dissolve the alkaloids, the same as the acids which are used in other processes, and the subsequent treatment is less troublesome; for example: Strychnine dissolves in 12 parts of boiling or 110 parts of cold alcohol; quinine in 2 parts boiling or 6 parts of cold

alcohol; caffeine in 10 parts of boiling or 75 parts of cold water; therefore, when drugs are percolated with a boiling or heated menstruum, their alkaloids are as readily dissolved as when acids are used, and their subsequent separation is much more simple.

The following are the more important Alkaloids which have been sufficiently investigated to receive reliable recognition and formulas. Many others, of course, exist, for it may be assumed that every genus of plants has its characteristic basic principle or principles which may be isolated, but only the more important ones have thus far received attention.

Important Alkaloids and their Salts.

Of the Alkaloids known and named by chemists, but few are used in medicine, and most of them are unimportant except as chemical products and curiosities. Of the small number which are used in medicine but few are employed as Alkaloids, but mainly as salts formed by the union of these organic bases with acids.

The Alkaloids are generally used for making the oleates, because they will combine with oleic acid, while their salts will not. Some of them are also employed in delicate preparations, where the acids with which they are combined as salts would be inadmissible.

The following important Alkaloids and their salts are those which are frequently used in medicine:

71.

Aconitina.

Aconitine—(Formerly called *Aconitia*).



This Alkaloid was formerly official, but has now been dropped from the U. S. P. It is still retained in the Br. P., and is much more used than formerly. It is present in Aconite, associated with several other Alkaloids, as *pseud-aconitine*, $\text{C}_{30}\text{H}_{39}\text{NO}_{11}$; *picraconitine*, $\text{C}_{31}\text{H}_{45}\text{NO}_{10}$; *aconine*, $\text{C}_{26}\text{H}_{39}\text{NO}_{11}$; *pseud-aconine*, $\text{C}_{27}\text{H}_{41}\text{NO}_8$; *aconitic acid*, $\text{H}_3\text{C}_6\text{H}_3\text{O}_6$, etc.

Owing to the many varieties of Aconite Root of commerce which yield different Alkaloids, any general formula which would apply to all would be uncertain in its results, as different varieties of Aconite yield different Alkaloids. This Alkaloid is, therefore, chiefly manufactured by a few manufacturing chemists who have made a reputation for their particular make. The crystallized Aconitine, made by the French chemist Duquesnal, stands the highest; but the most that is found in the market is amorphous, and is supplied by other chemical establishments of good repute. The following general process, which very much resembles that of the Br. P., except in the manner of extracting the drug, may be employed:

Aconite Root, in coarse powder,	{	any convenient
		quantity.
Alcohol,	{	of each a sufficient quantity.
Diluted Sulphuric Acid, . . .		
Stronger Ether,		
Water of Ammonia,		

Moisten the Aconite Root with one-half its weight of Alcohol, and pack it firmly in the water-bath percolator; pour upon it sufficient alcohol to cover it, and set it in a warm place for four days, then heat very moderately, and after one hour begin to percolate, adding alcohol to the drug and continuing the heat and percolation until it is exhausted. Distil off nearly all the alcohol by means of the water-bath and still, and add to the soft extract which remains, for each pound of the drug which was taken, half a pint of water, acidulated with half an ounce of diluted sulphuric acid. Heat this gently by water-bath until all the spirit has been evaporated, and filter through paper to remove resinous and oily substances. To this liquid add water of ammonia to slight excess and heat gently by water-bath until no odor of ammonia remains; separate the precipitate by filtration and carefully dry it, reduce it to a coarse powder and shake it with successive portions of ether, which dissolves the Aconitine; mix the several ethereal washings and distil off the ether, or allow it to evaporate spontaneously, then dissolve the residual extract thus obtained in water acidulated with sufficient diluted sulphuric acid; repre-

precipitate by carefully adding water of ammonia, collect the precipitate upon a filter and wash with a little water, then dry. The product is Amorphous Aconitine.

The following process for making crystallized Aconitine was proposed by John Williams, F. C. S., at the August, 1886, meeting of the Br. Pharmaceutical Council. The root of *Aconitum Napellus* only should be used :

The root should be brought to the state of a coarse powder only; if made very fine it is difficult to work. It should be exhausted with spirit of full strength (rectified spirit), say 62 to 64 per cent., about four ounces of tartaric acid to each cwt. of the root should be dissolved in the spirit; cold maceration for about four days, followed by percolation, returning the percolate to the root for the second maceration of a day, then percolating until the drug is exhausted and a very concentrated tincture is obtained. The spirit must now be distilled off at the lowest possible temperature, but the distillation should be stopped and a little hot water added before all the spirit has passed over. The evaporation by water-bath is then to be continued by gentle heat until all traces of spirit have been driven off. The thin aqueous extract is then to be filtered through coarse wetted filter paper, which separates the resinous and a portion of the oily matter; the remainder of the oily matter is then removed by shaking with ether, the ether is separated and to the remaining purified aqueous extract a slight excess of concentrated solution of carbonate of sodium (sal soda) is added, which precipitates the Alkaloid; this is heated and the Alkaloid separates into a mass, which is to be washed on a filter with hot water, then dried and macerated in several portions of pure ether. The ether washings are then to be mixed, filtered and allowed to evaporate spontaneously. Crystals of Aconitine may then be collected, drained and dried.

Aconitine has been used externally in the form of an ointment and oleate; the former is official in the Br. P. (see Ointments), and the latter is supplied by manufacturing pharmacists. (See Oleates.) On account of its great power and the uncertainty of the preparations on the market, it has been but

little used internally; but as more reliable and uniform Aconitine is now being produced, it is beginning to be more employed. It is generally used as a *trituration*: one part Aconitine with 500 parts sugar of milk. The dose of Aconitine is from $\frac{1}{500}$ to $\frac{1}{250}$ of a grain, hence the dose of a trituration 1:500 would be from 1 to 2 grains. It is used for the same purposes as Aconite in fevers, neuralgia, etc.

The following salts of Aconitine are sometimes used:

Nitrate of Aconitine.—This is prepared by exhausting Aconite root with alcohol, as directed for making Aconitine, distilling off the alcohol, adding boiling water and a slight excess of water of ammonia, filtering, dissolving the filtrate in water acidulated with nitric acid, evaporating and crystallizing. The crystals are then dissolved and purified by recrystallization.

Sulphate of Aconitine.—This is prepared in the same manner as the nitrate, except that sulphuric acid is used instead of nitric.

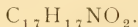
These Alkaloids are readily soluble and possess the same properties as Aconitine.

The dose, when administered internally, is from $\frac{1}{300}$ to $\frac{1}{200}$ grain.

72.

Apomorphina.

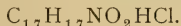
Apomorphine — (*Apomorphia*.)



The Alkaloid is seldom used, and when wanted may be most conveniently prepared from its hydrochlorate, which is the official salt employed in medicine. It may be made by dissolving the hydrochlorate of Apomorphine in water, precipitating it with bicarbonate of sodium, washing the precipitate with a little cold water and drying quickly by gentle heat.

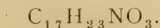
Apomorphine is morphine deprived of one molecule of water, as shown in the following formula:



73. **Apomorphinæ Hydrochloras.***Hydrochlorate of Apomorphine.*

This salt, which was made official in the last U. S. P., may be prepared by heating one part of morphine with twenty parts of pure hydrochloric acid in a strong glass or metal tube of at least fifteen times the capacity of the substances introduced. The tube must be securely sealed and the heat is best regulated by means of an oil-bath, by which it can be maintained for three hours at a temperature of 140° to 150° C. (284° to 302° F.). After heating in this manner the tube is cooled and its contents dissolved in water; bicarbonate of sodium in excess is then added, and, when the precipitate has subsided, the liquid is poured off and the precipitate shaken with successive portions of ether, which dissolves the apomorphine; a few drops of hydrochloric acid are then added to the ethereal washings and, after standing, crystals of hydrochlorate of morphine are found (the acid uniting with the apomorphine and separating from the ether because the salt is insoluble in ether). The crystals are then dissolved in boiling water, and recrystallized, making the pure hydrochlorate of apomorphine, which is employed in medicine.

Uses.—This salt is powerfully emetic and sedative, but does not possess narcotic principles. It has recently gained favor with physicians and is being considerably prescribed. The usual adult dose is from $\frac{1}{6}$ to $\frac{1}{4}$ grain, or, when injected hypodermically $\frac{1}{20}$ to $\frac{1}{10}$ grain.

74. **Atropina.***Atropine — (Atropia.)*

This is the principle Alkaloid of belladonna, official in the U. S., Br. and German pharmacopœias. It may be prepared

by the following process, which is in part adopted from the 1885 Br. P.:

Belladonna Root, in coarse powder, . . . 2 pounds.
 Alcohol, a sufficient quantity.
 Slacked Lime, 1 ounce.
 Diluted Sulphuric Acid, }
 Carbonate of Potassium, } of each a sufficient quantity.
 Chloroform, 3 fl.ounces.
 Purified Animal Charcoal, sufficient.
 Distilled Water, 10 fl.ounces.

Moisten the powder with a pint of alcohol, pack firmly in the water-bath percolator, and pour alcohol upon it until the drug is covered; set in a warm place to macerate for two days, then heat very moderately and, after one hour, begin to percolate, adding alcohol, and continuing the heat and percolation until the drug is exhausted; add the lime to the tincture thus obtained and agitate thoroughly, then filter; add sufficient diluted sulphuric acid to the filtrate to acidulate it slightly; filter again, distil off most of the alcohol, add the distilled water and evaporate until no odor of alcohol remains; then cool and carefully add carbonate of potassium dissolved in water to nearly neutralize the acid, taking care not to add an excess, and set aside for several hours; then filter, and add an excess of carbonate of potassium, then the chloroform, and agitate thoroughly for some time, allow to separate, pour off the upper liquid, distil the chloroform from the remainder, dissolve the residue in a little warm alcohol, digest the solution with a little animal charcoal, filter, evaporate and cool, until colorless crystals of atropine are obtained.

Uses.—On account of its insolubility Atropine is but little used except in oleates and ointments. It has the same properties as belladonna, and is a narcotic. Dose, $\frac{1}{120}$ to $\frac{1}{60}$ grain in trituration.

75. Atropinæ Sulphas.

Sulphate of Atropine—(*Sulphate of Atropia*.)

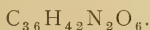
Atropine, 120 grains.
 Distilled Water, 4 fl.drachms.
 Diluted Sulphuric Acid, sufficient.

Rub the Atropine first to a fine powder and then to a smooth mixture with the water, and add diluted sulphuric acid, drop by drop, until the Alkaloid is dissolved and the solution is neutral. Evaporate the solution to dryness at a temperature not exceeding 37.70° C. (100° F.).

Uses.—This salt is quite soluble in water, and its solution (1 to 100) is employed as a mydriatic (to dilate the pupil of the eye) and for other purposes in which the action of belladonna is desired. The adult dose, internally, is $\frac{1}{120}$ to $\frac{1}{60}$ grain or less in trituration.

76. Beberina.

Beberine—(*Beberia*—*Bibiria*.)



This Alkaloid is obtained from nectandra or bebeeru bark, in which it exists combined with nectandrine ($\text{C}_{40}\text{H}_{46}\text{N}_2\text{O}_8$) and other Alkaloids. It is identical with *buxine*, from box, and *pelosine* or *cissampeline*, from pareira.

The Alkaloid is not used in medicine but its sulphate is official in the Br. P., and the Alkaloid may be prepared from it if desired by decomposing its solution in hot water with water of ammonia, and washing and drying the precipitate. From the similarity of names care must be taken not to dispense *beberine* or its salts when *berberine* is ordered, and *vice versa*.

77. Beberinæ Sulphas, Br.

Sulphate of Beberine—(*Sulphate of Beberia*.)

The following is the formula official in the Br. P.:

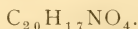
Bebeeru Bark, in coarse powder,	1	pound av.
Sulphuric Acid,	$\frac{1}{2}$	fl.ounce.
Slacked Lime, q. s., or	$\frac{3}{4}$	ounce av.
Solution of Ammonia, a sufficiency.		
Rectified Spirit,	16	fl.ounces.
Diluted Sulphuric Acid, a sufficiency.		
Water,	154	fl.ounces.
Distilled Water, a sufficiency.		

Add the sulphuric acid to the water, pour upon the bebeeru bark enough of the mixture to moisten it thoroughly; let it macerate for twenty-four hours, place it in a percolator and pass through it the remainder of the acidulated water; concentrate the acid percolate to 20 fl.ounces, cool and add gradually the lime in the form of milk of lime, agitating well, and taking care that the fluid still retains a distinct acid reaction; let it rest for two hours, filter through calico, wash the precipitate with a little cold distilled water, and to the filtrate add solution of ammonia until the fluid has a faint ammoniacal odor; collect the precipitate on a cloth, wash it twice with 10 ounces of cold water, squeeze it gently with the hand and dry it by the heat of a water-bath; pulverize the precipitate and wash with separate portions of the spirit, mix the washings, add 4 ounces of distilled water and distil the greater part of the spirit; to the residue add with agitation diluted sulphuric acid until the fluid has a slight acid reaction; evaporate to dryness, dissolve in distilled water, filter, evaporate to a syrupy consistence, spread on glass plates, and dry by a temperature not exceeding 140° F. (60° C.).

This is used as a substitute for quinine, or, rather, its action is similar to it, but it cannot be considered its equal. The dose is from 1 to 10 grains.

78. Berberina.

Berberine — (*Berberia*.)



The Alkaloid Berberine is found in a large number of plants, but is most abundant in hydrastis, columbo, gold-thread and several species of barberry. It may be obtained by several methods; but, perhaps, the simplest and the best is by boiling the coarsely-powdered barks or roots, or, preferably, percolating them in the water-bath percolator with boiling water until they are exhausted. The decoction is then to be evaporated to a soft extract and washed with successive portions of alcohol to dissolve out the Berberine; to the alcoholic washings, mixed and filtered, a little water is then to be added and the alcohol distilled off by means of a water-bath; the remaining

liquid is then condensed, allowed to cool, and crystals of Berberine will form; these may be purified by dissolving in hot water and recrystallizing.

Uses.—The Alkaloid is but little used, but its salts are extensively employed in medicine. It is a tonic to the mucous membrane, a bitter stomachic and general alterative, and has properties similar to quinine. The dose is from 1 to 8 grains.

79. Berberinæ Hydrochloras.

Hydrochlorate of Berberine.

This salt, which was formerly known as *hydrastin*, is generally prepared from golden seal. A decoction may be made, evaporated and treated with alcohol in the same manner as is directed for making Berberine. A little water, acidulated with hydrochloric acid, is then to be added to the alcoholic solution, the alcohol distilled, and the remaining liquid set aside, in which crystals of Hydrochlorate of Berberine will form; these are to be drained from the mother liquor, dissolved in hot water and purified by recrystallization.

It can also be prepared from the Alkaloid *berberine* by dissolving it in hot water, acidulated with hydrochloric acid, allowing to crystallize, and purifying by recrystallizing from hot water.

This salt gained considerable notoriety as an eclectic remedy under the name of *hydrastin*, and was afterwards known as *muriate of hydrastin*; but this salt, which is of a bright yellow color, has been shown to be the Hydrochlorate of Berberine, the salts of *hydrastine* being white instead.

Uses.—Its uses are similar to the Alkaloid—a tonic to the mucous surfaces, etc. It is much used in atonic dyspepsia and weakness of the digestive tract. Dose, 1 to 4 grains.

80. Berberinæ Sulphas.

Sulphate of Berberine.

This is prepared by dissolving Berberine in hot water, acidulated with sulphuric acid, crystallizing, redissolving the crystals in hot water and recrystallizing; or may be made directly

from the barks or roots containing Berberine in the same manner as is directed for making Berberine, except that water, acidulated with sulphuric acid, instead of water, must be added to the alcoholic solution before distillation.

Uses.—The uses of this salt are similar to the Alkaloid. It is also used in making elixirs, etc. The dose is from 1 to 4 grains.

81. Caffeina.

Caffeine — Theine — Guaranine.

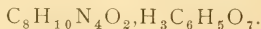


Coffee, tea, some other plants, and guarana contain an identical Alkaloid called *Caffeine*. Coffee contains about 1 per cent., tea $1\frac{1}{2}$ to 4 per cent., and guarana 4 to 5 per cent. of this Alkaloid. It is prepared from these substances by boiling them in water to make a strong decoction, precipitating the decoction with acetate of lead to remove astringent and other matter, filtering, passing sulphuretted hydrogen gas through the filtrate to remove excess of lead, filtering again, adding water of ammonia, evaporating and recrystallizing. It is seldom made except by manufacturing chemists.

Uses.—Caffeine is used as a nerve stimulant in sick and nervous headache and periodic nervous derangements. The dose is from 1 to 5 grains.

82. Caffeinæ Citras, Br.

Citrate of Caffeine.



Caffeine,	1 ounce.
Citric Acid,	1 ounce.
Distilled Water,	2 ounces.

Dissolve the citric acid in the water and stir the Caffeine into the heated solution; evaporate to dryness on a water-bath, constantly stirring towards the end of the operation.

The properties and uses of this preparation are the same as Caffeine. The dose is from 2 to 10 grains. It may be conveniently given in the form of an elixir.

83.

Chinoidium.*Chinoidin—Chinoidine. (Quinoidin.)*

In the manufacture of Quinine, after all the crystallizable salts have been obtained from the mother liquors, there remains a black amorphous mass, consisting of the mixed uncrystallizable Alkaloids of chinchona bark, mainly *quinicine* and *cinchonine*, which are isomeric with Quinine and Cinchonine, and have been produced by the action of heat upon them. To this mass is given the name *Chinoidin* or *Quinoidin*.

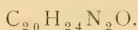
It has properties similar to other Alkaloids from cinchona bark and is considerably used as an anti-periodic, forming the base of most of the "ague pills" that are made. Dose from 3 to 30 grains.

84.

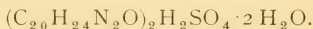
Cinchonidinæ Sulphas.*Sulphate of Cinchonidine—(Sulphate of Cinchonidia.)*

This salt remains dissolved in the mother liquors after the crystallization of sulphate of quinine, and is obtained from them by concentrating the liquors and crystallizing. As Sulphate of Cinchonidine is less soluble than sulphate of cinchonine, its crystals may be separated before the liquors are treated to obtain cinchonine. The barks from India contain a greater proportion of the Alkaloid *Cinchonidine* than those from South America. It resembles sulphate of quinine more than any other salt of cinchona, both in its appearance and action, and is much used as a substitute for it, the dose being about a third greater. It is tonic, febrifuge and anti-periodic.

Cinchonidine.—The Alkaloid from which the Sulphate of Cinchonidine is derived is not used in medicine or pharmacy. Its chemical composition is the same as cinchonine, but the arrangement of its molecules admits of its combining with one more molecule of water, when it forms salts with acids.

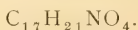
85. **Cinchonina.***Cinchonine* — (*Cinchonia*.)

In the manufacture of sulphate of quinine, after it has crystallized from its solution, sulphate of Cinchonine, which is more soluble, remains dissolved in the mother waters. By adding ammonia or solution of soda to the mother waters Cinchonine is precipitated and may be collected on a filter, washed with water, dried and dissolved in boiling alcohol, from which it is crystallized on cooling. It is but little used in medicine or pharmacy, on account of the greater value and solubility of other salts of Cinchona.

86. **Cinchoninæ Sulphas.***Sulphate of Cinchonine* — (*Sulphate of Cinchonia*.)

This salt is readily made by dissolving Cinchonine in dilute sulphuric acid and crystallizing. It is contained also in the mother liquor after the crystallization of sulphate of quinine, and may be obtained as Cinchonine and converted into the sulphate as above.

Uses.—Sulphate of Cinchonine has properties similar to sulphate of quinine, but may be given in much larger doses. It is more frequently used as a tonic than as an anti-periodic. The usual dose is from 2 to 5 grains; but from 20 to 40 grains are often given as an anti-periodic.

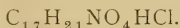
87. **Cocaina.***Cocaine* — *Erythroxyline*.

This Alkaloid and its salts, which have created such a *furor* in the medical world, are made from the leaves of *erythroxy-lon coca*. It may be prepared from its hydrochlorate, which is chiefly used, by precipitating an aqueous solution of hydro-

chlorate of cocaine with carbonate of sodium and washing and drying the precipitate.

88. Cocainæ Hydrochloras, Br.

Hydrochlorate of Cocaine.



Many processes for making Hydrochlorate of Cocaine have been proposed since it has been introduced; but they are all similar to the process employed for making other Alkaloids of the same class. The following is selected as the best for the general convenience of druggists:

Coca Leaves, in coarse powder, . . . 2 pounds.
 Alcohol, a sufficient quantity.
 Diluted Hydrochloric Acid, a sufficient quantity.
 Carbonate of Sodium, a sufficient quantity.
 Ether, 4 fl.ounces.
 Distilled Water, 2 pints.
 Animal Charcoal, 1 ounce.

Moisten the powder with a pint of alcohol, pack firmly in the water-bath percolator, cover the drug with alcohol and let stand in a warm place for two days; then heat moderately and begin to percolate, adding alcohol to the drug and continuing the heat and percolation until the drug is exhausted; distil off most of the alcohol, add the water and evaporate until all traces of alcohol have disappeared; add sufficient diluted hydrochloric acid to slightly acidulate the liquid, filter; add sufficient solution of carbonate of sodium to precipitate the Alkaloid; dissolve the Alkaloid from the solution by shaking with ether; separate and evaporate the etherial solution; dissolve the residue in alcohol, mix with the purified animal charcoal, filter; add diluted hydrochloric acid and water to the filtrate; distil off the alcohol; evaporate and collect the crystals of Hydrochlorate of Cocaine from the liquid and dry them on bibulous paper.

Uses.—Hydrochlorate of Cocaine is used in solution as a local anæsthetic in ophthalmic and other delicate surgical practice. The solutions employed are generally from two to four

per cent. of the salt in distilled water. They are applied by brushing over the parts. It is also somewhat employed internally as an anodyne and intoxicant, in doses of $\frac{1}{5}$ to 1 grain.

89. Codeina, U. S., Br.

Codeine — (*Codeia*.)



This Alkaloid, obtained from opium, stands next in importance to morphine, and is now being extensively used by physicians. It is obtained from the ammoniacal liquor left after the crystallization of morphine (see Morphine), by evaporating and crystallizing. As thus obtained it contains impurities which may be removed by dissolving in hot ether and allowing to evaporate spontaneously and crystallize.

Codeine is one of the most soluble Alkaloids known and is generally used in preference to any of its salts. It has lately come into notice and favor, and in England, especially, is being much used.

Codeinæ Sulphas.—Sulphate of Codeine is made by dissolving Codeine in a very small quantity of dilute sulphuric acid, evaporating and crystallizing. It possesses no advantages over the Alkaloid except that it is more soluble, and is seldom used. Its uses and dose are the same as Codeine.

Uses.—Codeine is a sedative, but possesses only slight narcotic properties. The dose is $\frac{1}{4}$ to 1 grain.

90. Colchicina.

Colchicine.



This Alkaloid is the active principle of *Colchicum Autumnale*, and is obtained from the seeds, flowers, or corm of the plant, in the same manner as is employed for aconitine. Its uses are the same as Colchicum, and the dose is from $\frac{1}{100}$ to $\frac{1}{80}$ grain.

91.

Conina.*Conine* — (*Conia*.)

The valuable medicinal principle of Conium is a volatile liquid Alkaloid called *Conine* or *Coniine*. It is obtained by exhausting Conium with boiling water in the water-bath percolator, and distilling the percolate until about one third passes over. This portion contains the volatile Alkaloid, which is separated from its solution by first filtering through animal charcoal to remove traces of oil and resin, then shaking the filtrate with ether, pouring off the ethereal solution which contains the Alkaloid, and allowing the ether to evaporate spontaneously; the liquid remaining after the evaporation of ether is *Conine*. It contains no oxygen, is soluble in water, alcohol or ether, and has a peculiar odor resembling the urine of mice.

Conium also contains *conhydrine* $\text{C}_8\text{H}_{17}\text{NO}$, and *Methylconine* $\text{C}_8\text{H}_{16}\text{CH}_3\text{N}$, which remain after the separation of Conine, and have properties similar to it.

Conine unites with acids to form salts; the *hydrochlorate of Conine* is the salt usually prescribed. It is narcotic and sedative, the dose being from $\frac{1}{20}$ to $\frac{1}{5}$ grain.

92.

Daturina.*Daturine* — (*Daturia*.)

This is obtained from the seeds or leaves of *Datura Stramonium*, but has proven to be a mixture of hyoscyamine and atropine instead of a distinctive Alkaloid.

It is a narcotic poison, having the same properties and uses as Stramonium. It is generally prescribed in the form of *Sulphate of Daturine*, the dose being $\frac{1}{100}$ to $\frac{1}{40}$ grain.

93.

Duboisina.*Duboisine* — (*Duboisia*.)

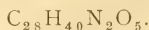
This Alkaloid is obtained from the leaves of several species of *Duboisia* found in Australia. It is a very poisonous Alka-

loid, similar in characteristics and action to atropine, for which it is used as a substitute. It may be prepared in the same manner as atropine (which see).

Sulphate of Duboisine is the soluble salt generally employed. It is given internally in doses of $\frac{1}{100}$ to $\frac{1}{60}$ grain, and its solution is employed as a mydriatic in the same manner as sulphate of atropine.

94. Emetina.

Emetine — (*Emetia* or *Emetina*.)



The active principle of ipecac is the Alkaloid *Emetine*. It also exists in some other plants. It is prepared from ipecac, which yields about 1 per cent. of the Alkaloid, by exhausting the drug with alcohol, by means of the water-bath percolator, distilling the percolate to recover the greater part of the alcohol, adding water in which a small quantity of carbonate of sodium is dissolved, which precipitates the Emetine together with the insoluble resins, etc. The precipitate is then washed with water acidulated with a little hydrochloric acid, which dissolves the Emetine; the solution is then filtered through animal charcoal to remove all traces of resin, etc.; solution of soda is added to the filtrate, which precipitates the Emetine, which is then collected, washed with chloroform, and the solution evaporated without heat to obtain the pure Emetine.

Uses.—Emetine is emetic, expectorant, and diaphoretic. The expectorant dose is from $\frac{1}{20}$ to $\frac{1}{10}$ grain. As an emetic it may be given in from $\frac{1}{4}$ to 1 grain doses every twenty minutes until emesis is produced.

95. Gelsemina.

Gelsemine — (*Gelseminia*.)



This Alkaloid is the chief medicinal agent of *Gelsemium Sem-pervirens* (yellow jasmine), and may be obtained by exhausting the powdered root with alcohol, by means of a water-bath percolator, distilling off most of the alcohol, adding acidulated

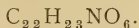
water to the residue which precipitates the resinous matter and holds the Gelsemine in solution. The solution is then filtered, solution of soda added to precipitate the Alkaloid; the precipitate is then washed with successive portions of ether; and the ethereal solution evaporated without heat to obtain the Gelsemine.

Hydrochlorate of Gelsemine is the salt generally prescribed. It is prepared by dissolving the Alkaloid in water acidulated with hydrochloric acid, concentrating by evaporation and crystallizing.

Uses.—Gelsemine is an anti-spasmodic, sedative, and somewhat anodyne, and must be given cautiously because of its cumulative action. The dose is $\frac{1}{60}$ to $\frac{1}{30}$ grain.

96. Hydrastina.

Hydrastine — (*Hydrastia*.)



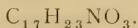
The white Alkaloid *Hydrastine* is recovered from the mother liquor left after the crystallization of salts of *berberine*, when prepared from hydrastis.

It is obtained by diluting the mother liquor with water, evaporating the alcohol, filtering to remove resinous matter, etc., adding ammonia to the filtrate, which precipitates the Alkaloid; dissolving the precipitate in hot alcohol; filtering again through animal charcoal to render colorless; evaporating the alcoholic solution and crystallizing.

Uses.—Hydrastine was formerly a waste product of the manufacture of berberine and its salts (hydrastin), but by the advertising of manufacturers, and being colorless, has come to be used in solution for injections, washes, etc. It is also given internally in doses of $\frac{1}{16}$ to 1 grain as a tonic and alterative.

97. Hyoscyamina.

Hyoscyamine — (*Hyoscyamia*.)

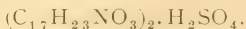


This Alkaloid is obtained chiefly from hyoscyamus, but is found also in belladonna and other species of *solanaceæ*. As

the *Sulphate of Hyoscyamine* is official, the Alkaloid may be prepared from it by precipitating a solution of the salt with soda or potassa alkali, collecting the precipitate, washing with cold water and drying on bibulous paper. For dose, etc., see *Hyoscyamine Sulphas*.

98. Hyoscyaminæ Sulphas, U. S.

Sulphate of Hyoscyamine.



Hyoscyamus seeds are macerated with gasoline to deprive them of their fixed oil. They are then dried and exhausted with alcohol, by water-bath percolation. The greater part of the alcohol is distilled off and the remainder mixed with water containing tannin in solution. The moist precipitate is then mixed with recently slacked lime, and washed with successive portions of alcohol to dissolve the Alkaloid. The alcoholic washings are then acidulated with dilute sulphuric acid, and agitated with ether to remove coloring matter and oil. The solution is then filtered through animal charcoal, concentrated by evaporation and crystals of Sulphate of Hyoscyamine are produced.

Uses.—This salt has the narcotic and sedative properties of the plant, and is used for sleeplessness, mania, delirium, etc. The dose is $\frac{1}{60}$ to $\frac{1}{40}$ grain.

99. Hyoscina.

Hyoscine — (*Hyoscia*.)



This Alkaloid is also obtained from *hyoscyamus* and has the same chemical composition as hyoscyamine. It is separated from the mother liquor after the removal of the hyoscyamine, and is similar to it in medicinal use. It has recently come into favor as a hypnotic, anodyne, and sedative.

100.

Kairina.*Kairine.*

This is not properly an Alkaloid as its termination would indicate, but the hydrochlorate of an artificial Alkaloid prepared from quinoline. It is advertised as a "new quinine," a "substitute for quinine," etc., and is used for the same purposes and in about the same doses as quinine.

101.

Morphina.*Morphine* — (*Morphia.*)

Morphine and its salts are among the most important and most frequently used remedies. Morphine has the distinction of being the first Alkaloid discovered. It was isolated in 1817 by a German apothecary named Sertürer, who named it *Morphium*. The process for making it was formerly official, but is not repeated in the present pharmacopœia. We repeat the process with some slight alterations.

Opium, sliced, 12 tr.ounces (13 $\frac{1}{8}$ av.oz.)

Water of Ammonia, 6 fl.ounces.

Animal Charcoal, in fine powder.

Alcohol,

Distilled Water, each a sufficient quantity.

Pour upon the sliced opium 4 pints of boiling water and work with a pestle in a mortar to a smooth paste. After standing a few hours, strain through a coarse sieve, and work what remains in the sieve again with boiling water until it all passes through the meshes; transfer the whole to a water-bath percolator, having first covered the diaphragm with burlap or other coarse cloth, and heat for one hour; then begin to percolate, adding water and continuing the heat and percolation until the drug is exhausted. Allow the liquid to settle, strain through muslin, evaporate to 6 pints, and filter. To the filtrate add 5 pints of alcohol and afterward 3 fl.ounces of the water of ammonia, mixed with 8 fl.ounces of alcohol.

After twenty-four hours pour in the remaining 3 fl.ounces of water of ammonia mixed with 8 fl.ounces of alcohol, and set the liquid aside to crystallize. The alcohol retains the coloring matters, resins, caoutchouc, etc., in solution. The ammonia combines with the natural acids containing morphine, and the Alkaloid morphine is precipitated and may be collected and purified by dissolving the precipitate in two pints of boiling alcohol, filtering while hot through animal charcoal and recrystallizing.

Morphine is quite insoluble, requiring 500 parts of boiling water, 100 parts of cold alcohol or 36 parts of boiling alcohol to dissolve it; it is therefore but little used in medicine, its soluble salts being employed instead. In pharmacy it is used as the basis of the morphine salts, and for making oleate of morphine.

Many salts of Morphine are known, but only the three official salts, the acetate, hydrochlorate and sulphate are much used. They are narcotic and sedative, the usual adult dose being $\frac{1}{8}$ grain.

102. Morphinæ Acetas, U. S.

Acetate of Morphine—(*Acetate of Morphia*.)

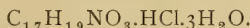


This is prepared according to the process formerly official, as follows :

Morphine, in fine powder,	480 grains.
Distilled Water,	8 fl.ounces.
Acetic Acid, a sufficient quantity.	

Mix the Morphine with the distilled water and carefully add acetic acid drop by drop to the mixture, stirring constantly, until the morphine is neutralized and dissolved. Evaporate the solution by means of a water-bath to the consistence of syrup, and set aside until it concretes. Lastly, dry the salt with a very gentle heat and rub it to a powder.

The Br. P. directs the salt to be made by decomposing the hydrochlorate with ammonia, dissolving the precipitate in acetic acid, etc.

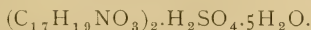
103. Morphinæ Hydrochloras, U. S.*Hydrochlorate of Morphine—(Muriate of Morphia.)*

The process formerly official in the U. S. P. is as follows:

Morphine, in fine powder, 480 grains.
 Distilled Water, 4 fl.ounces.
 Hydrochloric Acid, a sufficient quantity.

Mix the Morphine with the distilled water and carefully add hydrochloric acid to the mixture, drop by drop, constantly stirring it until the Morphine is neutralized and dissolved. Evaporate the solution by means of a water-bath, so that on cooling it may crystallize. Lastly, drain the crystals and dry them on bibulous paper.

The Br. P. directs this salt to be prepared from opium in a similar manner, as is employed for making Morphine, subsequently adding the hydrochloric acid. This is the salt chiefly used in Great Britain.

104. Morphinæ Sulphas.*Sulphate of Morphine—(Sulphate of Morphia.)*

The process formerly official in the U. S. P. is as follows:

Morphine, in fine powder, 480 grains.
 Distilled Water, 8 fl.ounces.
 Diluted Sulphuric Acid, a sufficient quantity.

Mix the Morphine with the distilled water, then carefully add diluted sulphuric acid, drop by drop, constantly stirring until the Morphine is neutralized and dissolved. Evaporate the solution by means of a water-bath, so that on cooling it may crystallize. Lastly, drain the crystals and dry them on bibulous paper.

The Br. P. directs the Morphine to be diffused in about twice its weight of boiling alcohol, and dilute sulphuric acid added to dissolve it, etc.

Sulphate of Morphine is employed in the U. S. much more than any other salt of Morphine, in fact, the other salts are but little used.

Fatal mistakes sometimes occur by dispensing it for quinine, as it so much resembles it in general appearance. It should never be transferred to a shelf or dispensing bottle, but should always be kept in an original $\frac{1}{8}$ ounce bottle, and distant from the package containing quinine; all danger will thus be avoided.

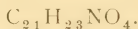
Other Salts of Morphine.

Other salts of morphine are sometimes prescribed; as the *meconate* and *bi-meconate* of Morphine, which are combinations of meconic acid with Morphine; the *bromide* or *hydrobromate* of Morphine, being Morphine combined with hydrobromic acid; the *nitrate*, *hydriodate*, *tartrate*, *valerianate*, etc., combinations of Morphine with these acids; but there is little use for any except the three official salts.

105.

Meconidina.

Meconidine.

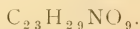


This Alkaloid found in opium is readily obtained by precipitating a solution of meconic acid with an alkali, washing and drying the precipitate. It is not used in medicine, but is of interest as the base of the meconic principle in opium.

106.

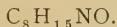
Narceina.

Narceine — (*Narceia*.)



Another Alkaloid of opium much resembling morphine, but more soluble, is obtained from the mother liquor after the crystallization of morphine. It is narcotic and may be given in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses.

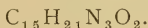
107.

Pelletierina.*Pelletierine*—(*Punicine*.)

This Alkaloid from the root bark of *Punica Granatum* (pomegranate) has recently come into use as a *tæniacuge*. It is a liquid obtained by mixing milk of lime with the bark, exhausting with hot water, shaking the percolate with chloroform, and allowing to evaporate. Dose $\frac{1}{60}$ to $\frac{1}{10}$ grain.

Tannate of Pelletierine is the form in which it is usually administered for removing tape worm, the dose being $\frac{1}{2}$ to 2 grains.

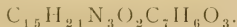
108.

Physostigmina.*Physostigmine*—*Eserine*.

The active principle of calabar bean (*Physostigma*) is obtained by exhausting finely powdered calabar bean with alcohol by means of the water-bath percolator, distilling off most of the alcohol of the percolate, adding water to the residue and shaking with ether, which dissolves the Alkaloid. The ether is allowed to evaporate and the Alkaloid is obtained in crystals.

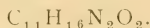
Uses.—Physostigmine, which is more frequently called Eserine, is a powerful sedative poison, the dose being $\frac{1}{200}$ to $\frac{1}{60}$ grain.

109.

Physostigminæ Salicylas, U. S.*Salicylate of Physostigmine or Eserine.*

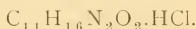
This official salt may be prepared by adding two parts of Physostigmine to a solution of one part of salicylic acid in 35 parts of boiling water, and allowing to crystallize on cooling.

Uses.—This salt is used in solution to contract the pupil of the eye, and internally as a sedative in doses of from $\frac{1}{120}$ to $\frac{1}{20}$ grain.

110. Pilocarpina.*Pilocarpine—(Pilocarpina.)*

This is the chief medicinal constituent of the leaves of *Pilocarpus pennatifolius* (jaborandi). It is obtained by exhausting the drug with alcohol by the water-bath percolator, distilling off most of the alcohol from the percolate, adding water and soda or potassa alkali, collecting the precipitate, washing with chloroform, and evaporating the solution. This produces Pilocarpine, an uncrystallizable Alkaloid.

Uses.—Pilocarpine is a diaphoretic and sialogogue. Dose, $\frac{1}{16}$ to $\frac{1}{4}$ grain.

111. Pilocarpinæ Hydrochloras, U. S.*Hydrochlorate of Pilocarpine.*

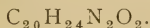
This is prepared by adding the Alkaloid Pilocarpine to dilute hydrochloric acid until it is neutralized or until no more will dissolve. The solution is then concentrated by evaporation and allowed to crystallize. Lastly, the crystals are drained and dried on bibulous paper.

Uses.—The salt is used for the same purposes as the Alkaloid, and its solution is often employed hypodermically. Dose, $\frac{1}{8}$ to $\frac{1}{4}$ grain.

112. Pyridina.*Pyridine.*

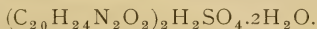
This liquid Alkaloid was formerly obtained from bone-oil and more recently from coal-tar. It is the first member of the Pyridine series, and consequently forms the basis of many very important substances. It has been suggested that all the Alkaloids are built up by derivation from Pyridine hydrides. It has no medicinal use.

113.

Quinidina.*Quinidine — Quinidia.*

This Alkaloid may be obtained by decomposing its sulphate (which is recovered from the mother liquors after the crystallization of sulphate of quinine) with water of ammonia or other alkaline solution, washing the precipitate on a filter and drying. The Alkaloid is seldom used except for making elixirs.

114.

Quinidinæ Sulphas, U. S.*Sulphate of Quinidine — (Sulphate of Quinidia.)*

This salt is obtained from the mother liquors from which sulphate of quinine has been removed by crystallization. It differs from sulphate of quinine by being much more soluble, containing a smaller percentage of H_2O , and by being dextrogyre while quinine is lævogyre. It is sometimes called dextroquinine.

Medicinally, it is equal to quinine as an anti-periodic and anti-pyretic, but not as a tonic. The dose is from 1 to 20 grains.

115.

Quinina.*Quinine — Quinia.*

The Alkaloid Quinine is but little used in medicine on account of its insolubility as compared with its salts. In pharmacy it is frequently directed for making preparations in which the salts are objectionable, as some of the elixirs, syrups, etc., and for making oleate of Quinine.

It may readily be prepared from the sulphate or other salts of Quinine by adding to their acid solution water of ammonia or other alkaline solution just sufficient to decompose the salt and precipitate the Alkaloid. The precipitate is then washed on a filter with cold water and carefully dried.

Uses.—Quinine and its salts are tonic, anti-periodic, and anti-pyretic. The dose of the Alkaloid and most of its salts is from 1 to 20 grains according to circumstances. It is needless to remark that preparations of Quinine are the most valuable and the most generally used of any medicines.

116. Quininæ Bi-Sulphas, U. S.

Bi-sulphate of Quinine.



This salt is prepared by adding to Sulphate of Quinine mixed with eight times its weight of water, sufficient sulphuric acid to dissolve it; concentrating the solution by evaporation and allowing to crystallize; then draining and drying the crystals on bibulous paper.

It is much more soluble—requiring but ten parts of cold water to effect its solution—and contains about one-eighth less of the Alkaloid than the Sulphate of Quinine, but otherwise it does not differ from it in general use, properties and dose.

117. Quininæ Hydrobromas, U. S.

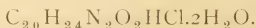
Hydrobromate or Bromide of Quinine.



This may be most readily made by decomposing 40 parts of Sulphate of Quinine dissolved in 10 times its weight of hot alcohol, with 11 parts of bromide of potassium dissolved in 3 times its weight of water. The sulphuric acid combined with the Quinine unites with the potassium, forming sulphate of potassium, which crystallize and the bromide unites with the Quinine in the remaining solution, which is concentrated until crystals of Hydrobromate of Quinine are formed. The uses and doses are similar to other quinine salts.

118. Quininæ Hydrochloras, U. S., Br.

Hydrochlorate or Muriate of Quinine.



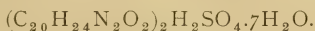
This may be made in the same manner as Sulphate of Quinine, using hydrochloric instead of sulphuric acid, or by

decomposing Sulphate of Quinine with chloride of barium in the same manner as is directed for preparing Hydrobromate of Quinine; or by dissolving the Alkaloid Quinine with diluted hydrochloric acid, concentrating the solution and crystallizing.

The uses and doses are similar to the Sulphate of Quinine, but it is very much more soluble, making it more desirable for many purposes. It is the only Quinine salt except the Sulphate that is recognized by the British Pharmacopœia.

119. Quininæ Sulphas, U. S., Br.

Sulphate of Quinine — (*Sulphate of Quinia*.)



This is the best known and most extensively used of any of the salts of Quinine. It is popularly known and called for as "Quinine," and may be generally dispensed when "Quinine" is called for. It is less desirable in many respects than the Hydrochlorate or Bi-sulphate of Quinine, but has the advantage of being well known and therefore stands at the head of the Quinine salts.

It is made from cinchona bark on a large scale by manufacturers of chemicals in this country and in Europe, and forms a very important article of commerce.

Manufacturing chemists who prepare it have, each, their special processes which produce it, varying slightly from each other in general appearance; but medicinally and chemically they are the same.

A process for making it was formerly official in the U. S. P., but was not repeated in the 6th revision.

It is given here for convenient reference:

Yellow Cinchona, in coarse powder, 48 troyounces.

Hydrochloric Acid, 3½ troyounces.

Lime, in fine powder, 5 troyounces.

Animal Charcoal, in fine powder.

Sulphuric Acid.

Alcohol.

Water.

Distilled Water, of each a sufficient quantity.

“ Boil the cinchona in 13 pints of water mixed with $\frac{1}{3}$ of the hydrochloric acid, and strain through muslin; boil the residue twice successively with the same quantity of water and acid as before, and strain. Mix the decoctions, and, while the liquid is hot, gradually add the lime, previously mixed with two pints of water, stirring constantly until the Quinine (Alkaloid) is completely precipitated. Wash the precipitate with distilled water, and having pressed, dried and powdered it, digest it in boiling alcohol. Pour off the liquid and repeat the digestion several times until the alcohol is no longer rendered bitter. Mix the liquids and distill off the alcohol until a brown viscid mass remains. Upon this, transferred to a suitable vessel, pour 4 pints of distilled water, and having heated the mixture to the boiling point add as much sulphuric acid as may be necessary to dissolve the Quinine. Then add $1\frac{1}{2}$ troyounces of animal charcoal, boil the liquid for two minutes, filter while hot and set it aside to crystallize. Should the liquid before filtration be entirely neutral, acidulate it very slightly with sulphuric acid. Should it, on the contrary, change the color of litmus paper to a bright red, add more animal charcoal. Separate the crystals from the liquid, dissolve them in boiling distilled water, slightly acidulated with sulphuric acid, add a little animal charcoal, filter the solution and set it aside to crystallize. Lastly, dry the crystals on bibulous paper with a gentle heat and keep them in a well-stopped bottle.”

Our own process differs from this by exhausting the drug with alcohol by means of the water-bath percolator without using the hydrochloric acid, distilling most of the alcohol, adding water and precipitating the Quinine with water of ammonia or solution of soda, washing the precipitate with hot alcohol, and proceeding as directed in the former official formula.

Quinine Sulphate is soluble in 740 parts of cold or 30 parts boiling water; in 65 parts cold or three parts boiling alcohol; is precipitated by soluble alkalies, but redissolved by an excess of alkali.

Uses.—Sulphate of Quinine is a tonic antiperiodic and antipyretic; its uses are too well known to require further mention.

The dose is from 1 to 20 grains. It is given in powders, pills, capsules, mixtures, elixirs, syrups, etc.

120. Quininæ Valerianas, U. S.

Valerianate of Quinine.



This may be made by decomposing a solution of Sulphate of Quinine with water of ammonia, washing the precipitate, dissolving it in valerianic acid dissolved in a large quantity of water, and crystallizing. It is rarely used because the quantity of valerianic acid which it contains is too small to be of much medicinal value.

Other Salts of Quinine.

The foregoing are all the salts of Quinine official in the U.S.P., but many other salts are made and sold by manufacturing chemists; they are, however, but little used, and the processes for making them are not different from those already given in the preceding pages; being chiefly made by decomposing a solution of the Sulphate, and recombine it with the acid desired.

"*Hospital Quinine*" is a mixture of the sulphates of cinchonidine, quinidine and Quinine, generally containing about 50 per cent. of Quinine in combination.

"*Dextro-Quinine*" and "*Cincho-Quinine*" are preparations containing Quinidine mixed with cheaper salts of cinchona.

"*Sweet Quinine*," which had at one time a great run, proved to be a mixture of the cheaper salts of cinchona with powdered glycyrrhizin.

Several other preparations claiming to be substitutes for Quinine are made up of the cheaper salts of cinchona bark combined with other substances; but since low prices have ruled for Sulphate of Quinine there is little demand for them.

121. Quinolina.

Chinoline — Leucoline — Quinolinc.



A liquid Alkaloid obtained from coal tar, closely related in chemical composition and action to the Cinchona Alkaloids.

It is the first member of the Leucoline or Chinoline series, which have been much experimented upon for the artificial production of Quinine.

The *Tartrate of Chinoline* is sometimes used in medicine for the same purpose as Quinine, and given in doses of from 4 to 16 grains.

122.**Sanguinarina.**

Sanguinarine.



This Alkaloid may be made by exhausting *Sanguinaria* with alcohol, by means of the water-bath percolator, distilling off most of the alcohol, adding water and solution of soda to precipitate, washing the precipitate with hot alcohol, filtering through animal charcoal, concentrating and crystallizing. It is white, but yields very bright red salts with acids.

Nitrate of Sanguinarine and *Sulphate of Sanguinarine* have been introduced by manufacturing chemists, and are quite favorably received by practitioners.

Uses.—Sanguinarine and its salts are used in bronchitis, pneumonia and laryngitis in doses of $\frac{1}{20}$ to $\frac{1}{10}$ grain.

123.**Strychnina, U. S., Br.**

Strychnine — (*Strychnia*.)



This poisonous Alkaloid may be prepared by the former U. S. P. process, or by the 1885 Br. P. method. As the latter is later authority, and fully as concise, we repeat it (slightly altered) here:

Nux Vomica, in fine powder, 16 oz. av.
 Acetate of Lead, 180 grains.
 Solution (Water) of Ammonia,
 Rectified Spirit,
 Distilled Water, of each a sufficiency.

Macerate the powder for 12 hours with two pints of the spirit and one of water, by gentle heat; transfer to the water-

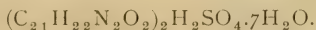
bath percolator, heat and percolate with two parts of spirit to one part of water until the drug is exhausted. Distill off the spirit, evaporate the residue to about 16 fl.ounces and filter when cold; then add the acetate of lead previously dissolved in distilled water, so long as it occasions any precipitate; filter; wash the precipitate with 10 ounces of cold water, adding the washings to the filtrate; evaporate the clear liquid to eight fl.ounces and when it has cooled add the ammonia in slight excess, stirring thoroughly. Let stand for 12 hours, collect the precipitate on a filter, wash it once with a few ounces of cold water, dry it by gentle heat, and boil it with successive portions of rectified spirit till the washings are no longer perceptibly bitter. Distill off most of the spirit, evaporate the residue to about $\frac{1}{2}$ ounce and set aside to cool. Cautiously pour off the yellowish mother liquor (which contains the *brucine*) from the white crust of Strychnine which adheres to the vessel. Wash the crust on a filter paper with a mixture of two parts of rectified spirit and one of water till the washings cease to become red on the addition of nitric acid; finally, dissolve it by boiling with an ounce of rectified spirit and set aside to crystallize. More crystals may be obtained by evaporating the mother liquor.

Brucine — $C_{23}H_{26}N_2O_2$ — may be recovered from the yellowish mother liquor which is poured off (see above) by concentration and crystallization.

Uses.—Strychnine and its salts are among the most valuable tonics we possess. It is given particularly in nervous exhaustion, and as a general tonic combined with other remedies. Dose, $\frac{1}{100}$ to $\frac{1}{20}$ grain.

124. Strychninæ Sulphas, U. S.

Sulphate of Strychnine — (*Sulphate of Strychnia*.)



This may be prepared by dissolving Strychnine in diluted sulphuric acid, concentrating the solution and crystallizing. The crystals are then drained and dried on bibulous paper. It is the most used of any of the strychnine salts because of its

stability and ready solubility. It is used in pills, mixtures, elixirs, syrups, etc., alone and in combination with other medicines. The dose is the same as the Alkaloid, from $\frac{1}{100}$ to $\frac{1}{20}$ grain.

Other Salts of Strychnine.

Many other salts of Strychnine are made by manufacturing chemists; but the foregoing are all that are official or that are much used. If desired, others can be made in the same manner as the Sulphate by using other dilute acids in place of sulphuric.

125.

Thallina.

Thalline.

A new Alkaloid derived from Peruvian bark, and recently discovered by Prof. Straup, of Vienna. It possesses remarkable antipyretic properties, and is very prompt and efficient in its action.

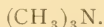
The sulphate is the salt most frequently used; the dose being from 2 to 5 grains. The tannate and tartrate are also prescribed.

Antipyrin and *Antifebrin* are proprietary antipyretics, lately introduced, similar in action to thalline.

126.

Trimethylamina.

Trimethylamine.



This Alkaloid is isomeric with *Propylamine*, and its solution in water is furnished and used as propylamine. True propylamine is not used in medicine.

Trimethylamine is made from herring-pickle by distillation with lime, the distillate being neutralized with hydrochloric acid and evaporated and the saline residue treated with absolute alcohol which dissolves out the Alkaloid and leaves the chloride of ammonium undissolved. The alcoholic solution is then distilled, the residue dissolved in water and again carefully distilled with lime, the distillate being the liquid Alkaloid. This Alkaloid is also obtained from the residues left in the

preparation of beet sugar; from ergot, cod-liver oil, guano and other substances.

Hydrochlorate of Trimethylamine, which is also sold under the name of *Chloride or Hydrochlorate of Propylamine*, is obtained by neutralizing Trimethylamine with hydrochloric acid, evaporating and crystallizing.

Uses.—The hydrochlorate is used in articular rheumatism and gout. The dose is from 2 to 3 grains, generally given in elixir or syrup.

127. Veratrina, U. S., Br.

Veratrine — (*Veratria*.)

An Alkaloid or mixture of Alkaloids obtained from the seeds of *cevadilla* (*asagrea officinalis*) by exhausting them with alcohol by means of the water-bath percolator, recovering most of the alcohol by distillation, adding water, filtering to remove resins, etc., adding solution of potassa or ammonia to the filtered liquid, collecting the precipitate, dissolving it in alcohol, filtering through animal charcoal, concentrating and crystallizing.

Uses.—It is used externally in liniments, ointments, and applications for neuralgia, rheumatism, etc. It is very poisonous.

Other Alkaloids.

The foregoing Alkaloids and their salts are the chief *natural* Alkaloids now employed in medicine, but others are being constantly brought to notice, and finding use and favor as medicinal agents. Quite a number of *artificial* Alkaloids are now being introduced, and finding new application in medicine and the arts. The coal tar bases, aniline, pyridine, toluidine, etc., and their derivatives are extensively used in the arts, besides forming the bases of many of the artificial Alkaloids, which are now made.

The chemist in his laboratory is now able to prepare, by synthesis, several of the Alkaloids, either identical with or

closely resembling the natural ones, and it is not improbable that ere long most of the valuable Alkaloids that are now obtained from rare or expensive drugs may be reproduced in the chemist's workshop from worthless substances, that have heretofore been waste products. It is not expedient to give in detail the complex operations by which artificial Alkaloids are produced, but it may be stated in general that they are mostly made, either by converting one Alkaloid of a drug into another by supplying or abstracting some portion of its elements, or by substituting atoms of one element for another in the complex molecules of organic bases. Other Alkaloids will be noticed under other headings.

ALLYL.

Acryl—Propylenyl.



The radical of the essential oils containing sulphur is called *Allyl*. The plants or oils containing this radical combined with sulphur have peculiar pungent, penetrating odors which cannot be mistaken. Asafœtida, scurvy grass, cress, garlic, leek, horseradish, radish, shepherd's purse, wallflower, mustard, onion, nasturtium, and many other less familiar plants owe their peculiar odors and pungency to combinations of the Allyl radical with some form of sulphur. The Allyl and glyceryl radicals are isomeric, being identical in composition, but the former is univalent and the latter trivalent.

128. Allyl Hydrate. $\text{C}_3\text{H}_5\text{HO}$.—(*Allyl Alcohol*.)—By uniting with the elements of water Allyl forms a hydrate or alcohol which boils at 96°C . It has no use at present in pharmacy.

129. Allyl Sulphide. $(\text{C}_3\text{H}_5)_2\text{S}$.—(*Artificial Oil of Garlic*.)—This is artificially produced by decomposing Allyl Iodide with an alcoholic solution of sulphide of potassium. Its composition is the same as the natural *Volatile Oil of Garlic*.

130. Allyl Sulphocyanate. $\text{C}_3\text{H}_5\text{CNS}$.—(*Artificial Oil of Mustard*.)—This is prepared by distilling Allyl Sulphate with potassium isothiocyanate, or by gently heating a mixed alcoholic solution of sulphide of Allyl and bichloride of mercury, with sulphocyanide of potassium. It is identical in

composition with the natural *volatile oil of mustard*, which is chemically *Allyl isothiocyanate*.

The volatile oil of mustard is used in some liniments and pain relievers. Its vapor is very irritating, and care must be used in dispensing it. It should be very much diluted when employed.

ALOE—ALOES.

As found in the market Aloes consists of the inspissated juice of the leaves of several varieties of *Aloe* found in Africa.

The U. S. P. recognizes only the variety produced from *Aloe Socotrina*; the Br. P. directs both Barbadoes and Socotrine Aloes, while the G. P. names Cape Aloes, which includes a variety of different species native of the Cape of Good Hope. The various species are all more or less used in pharmacy, the Barbadoes and Socotrine being chiefly employed for man and the Cape Aloes for horses and cattle.

The fleshy leaves of the Aloe are cut off near their base and their juice allowed to drain into troughs or vessels. The collected juice is then evaporated to the consistence of an extract and run into boxes, kegs or gourds, in which shape it is brought to the market.

Aloes is a well-known and much-used purgative, being familiarly known to the household as "Picra." It is the active ingredient in most patent and cathartic pills. In small doses, 1 to 2 grains, it is a tonic, stomachic, and is the chief ingredient of several "bitters" which have been extensively sold. The laxative dose is 2 to 3 grains, and the dose as an active purgative is 10 to 13 grains.

Various preparations of Aloes will be found under their proper headings, as extracts, pills, powders, tinctures, wines, etc.

131. Aloe Purificata, U. S.

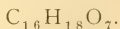
Purified Aloes.

Aloes,	100 parts or 10 ounces av.
Alcohol,	15 parts or 2 fl.ounces.

Heat the Aloes by water-bath until it is completely melted, then add the alcohol and having stirred the mixture thoroughly

strain it through a fine sieve which has just been dipped into boiling water. Evaporate the strained mixture by means of a water-bath, constantly stirring until a thread of the mass becomes brittle on cooling.

The object of purifying the Aloes is to remove foreign substances, such as sticks, stones, dirt, and other impurities which, by the carelessness in making it, have been introduced. Its properties and uses are the same as Aloes. It is only official in the U. S.

132.**Aloin, Br.**

“A crystalline substance extracted from Aloes by solvents and purified by recrystallization. As obtained from the different varieties of Aloes, the products differ slightly, but their medicinal properties are similar.” Br.

Aloin appears to be the active or cathartic principle of Aloes. It is obtained by treating Aloes with acidulated boiling water, which dissolves the Aloin and resinous matter. After standing for some hours to cool the liquid is poured off from the resin and evaporated to the consistence of syrup. When cool, crystals of Aloin form, which may be purified by repeated recrystallization from hot alcohol.

The laxative dose is from $\frac{1}{10}$ to $\frac{1}{4}$ grain, the cathartic dose $\frac{1}{2}$ to 2 grains. It is considerably used, in combination with other medicines, in “little liver pills.”

ALUMINIUM.

Symbol, Al; Atomic weight, 27.3; Sp. gr. 2.56.

Aluminium is a metal element which exists in nature in combination with silicic acid in clays and rocks. In this form it is very abundant, but because of the difficulty of separating it from its combinations it is quite expensive. It was first obtained from the chloride by Wöhler in 1828, but was known only as a laboratory product until 1858, when Deville improved the methods of producing it so that it could be manufactured for commercial purposes; recent processes have, however,

been introduced by which it can be furnished at a much lower price, and it will be much more employed in the arts than formerly. It is a very light, silver-white metal, strong, ductile, malleable, and non-corrosive, admirably fitting it for many useful and ornamental purposes. The only use to which the metal is applied in the business of the pharmacist is for making grain weights, but its salts unite with the salts of the alkali metals, to form double salts called *alums*, which are considerably used in medicine and pharmacy, and extensively employed in dyeing and other arts. Besides the double salts, it forms single salts with many of the acids, though they are but little used, the hydrate and sulphate only being official.

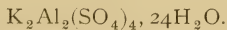
From its wide distribution in nature, its importance and usefulness in the arts, and the possibilities of its application, it is now called the "Metal of the Future."

Aluminium Bronze is an alloy considerably used for making ornaments, mounting instruments, etc. It is composed of 9 parts of copper and one of aluminium.

Kaolin or *China Clay* ($\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 + 2\text{H}_2\text{O}$) is a hydrated silicate of Aluminium oxide, found in nature, and used for making china-ware, crockery, etc. It is sometimes used in pharmacy.

133. Alumen, U. S., Br.

Alum.



This is the official *potassa-alum* (Aluminii et Potassii Sulphas). The *alum* of commerce is *ammonia-alum* $(\text{NH}_4)_2\text{Al}_2(\text{SO}_4)_4$. It is to be regretted that the official salt is not the same as the commercial, for, on account of their difference, the official salt is seldom used, the commercial alum being supplied whenever it is directed.

The potassa-alum is prepared by treating alum-clay with sulphuric acid to form Aluminium Sulphate, then adding potassium sulphate, which unites to form the double salt. Ammonia-alum is made in a similar way, ammonium sulphate being used instead of potassium sulphate.

Alum is a powerful astringent, and is used externally as a

wash, styptic, etc. It is also given internally as an astringent and in croup as an emetic, and is much used as an astringent injection and gargle.

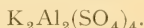
Potassa-alum is soluble in about 10 parts of cold water, while ammonia-alum requires about 16 parts.

Alum Curd.—Alum in the form of curd, made by rubbing white of egg with a lump of alum until it is coagulated, or by mixing half a teaspoonful of powdered alum with the white of one egg, is considerably used as a “poultice” for inflammation, especially of the eye.

Alum Whey is a domestic remedy, made by boiling a large teaspoonful (60 grains) of powdered alum with a glassful (about 10 fl.ounces) of milk, and straining when cool. The liquid is taken in doses of a wineglassful for looseness of the bowels, etc.

134. **Alumen Exsiccatum, U. S., Br.**

Dried or “Burnt” Alum.



This is officially made by exposing alum for several days to a temperature of about 80° C. (176° F.) until it has thoroughly effloresced, and then placing it in a porcelain capsule and gradually heating it to a temperature of 200° C. (392° F.) and continuing the heat until the mass becomes white and porous. As found in commerce it is usually made from commercial ammonia-alum, by melting it in an iron kettle and continuing the heat until the water of crystallization has entirely evaporated. In a domestic way it is made by putting a lump of alum on a hot stove and letting it remain until it is dry.

With this, as with the official alum, potassa-alum is seldom employed to make it, ammonia-alum being used instead.

As this is simply alum deprived of its water of crystallization it has the same general properties as alum, but is much more powerful. It is chiefly used as an escharotic for removing “proud flesh” or other morbid growths. It is also used for hemorrhages, particularly of the nose, and of the gums after drawing teeth. It is generally used in the form of dry powder.

135. Aluminii Hydras, U. S.*Hydrate of Aluminium—(Hydrated Alumina.)*

This is a white light powder, somewhat resembling magnesia, made by precipitating a saturated solution of alum with a solution of carbonate of sodium; the proportions are as follows:

Alum, 11 parts or ounces.

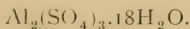
Carbonate of Sodium, 10 parts or ounces.

Distilled Water, a sufficient quantity.

Dissolve each salt separately in 150 parts (or about 10 pints) of distilled water, filter the solutions and heat them to boiling, then having poured the hot solution of carbonate of sodium into a capacious vessel, gradually pour in the hot solution of alum, with constant stirring, and add about 100 parts or 6 pints of boiling distilled water. Let the precipitate subside, pour off the water and wash it well with fresh water as directed for washing precipitates (page 44), then dry at a temperature not exceeding 40°C . (104°F .) and reduce to a uniform powder, which is the hydrate.

The Hydrate of Aluminium is an absorbent and antacid, and is given in doses of from 2 to 5 grains in irritation of the stomach, etc. Externally it is used for covering inflamed surfaces to prevent chafing, etc. It is also used as an ingredient in face-powders and liquid cosmetics.

Alumina.—*Oxide of Aluminium* (Al_2O_3).—This is the most abundant of the earths, the chief constituent of clay. It may be prepared by heating the hydrate to a white heat in a covered crucible. The Hydrate and Oxide of Aluminium readily dissolve in acids forming soluble salts.

136. Aluminii Sulphas, U. S.*Sulphate of Aluminium.*

This may be made by dissolving Hydrate of Aluminium to saturation in diluted sulphuric acid by the aid of heat, evap-

orating the solution and crystallizing or granulating by stirring until dry. It is but little used internally, but in the form of a weak solution (1 ounce to 1 quart) is used as an astringent injection and cleansing wash for ulcers, etc. A saturated solution is a powerful escharotic and astringent, and may be used for the same purposes as "burnt" alum when it cannot well be applied.

Other Salts of Aluminium.

Besides the foregoing official Salts of Aluminium, it combines with other acids and elements forming salts sometimes used in pharmacy, medicine and the arts.

137. Aluminium Acetate — $\text{Al}_26\text{C}_2\text{H}_3\text{O}_2$.—Made by dissolving Aluminium Hydrate in acetic acid to saturation, evaporating and crystallizing. It is chiefly used for dyeing and calico printing as a mordant, but is sometimes used in medicine for diarrhœa and as a preservative for animal tissues in the form of injection.

138. Aluminium Chloride — Al_2Cl_6 .—By dissolving Aluminium Hydrate in hydrochloric acid to saturation, evaporating carefully and crystallizing; also by sublimation.

Chloralum.—An impure solution of Aluminium Chloride called *Chloralum*, is made by dissolving one part of aluminium hydrate in five parts of commercial hydrochloric acid. It is used for disinfecting.

139. Aluminium Bromide — Al_2Br_6 .—By passing vapor of bromine over a heated mixture of alumina and carbon. Sometimes used as an antiseptic.

140. Aluminium Iodide — Al_2I_6 .—By heating Aluminium and iodine together in closed tubes.

141. Aluminium Nitrate — $\text{Al}_2(\text{NO}_3)_6.18\text{H}_2\text{O}$.—By dissolving Aluminium Hydrate in nitric acid to saturation, filtering, concentrating and crystallizing.

142. Aluminium Phosphate — $\text{Al}_2(\text{PO}_4)_2$.—By mixing a neutral solution of Alumina with a solution of sodium phosphate and collecting the precipitate.

143. Aluminium Tannate.—By triturating 1 part of Hydrate of Aluminium and 2 parts of tannic acid with sufficient water to make a mixture the consistence of syrup, and then evaporating to dryness by a heat not over 120°F . It is used in dysentery, hemorrhage, etc., in doses of 3 to 12 grains.

Other Salts of Aluminium may be prepared with other acids and elements, but the foregoing are all that are generally known.

AMMONIUM.

Symbol, NH_4 ; Atomic weight, 18.

A hypothetical metal, the analogue of potassium and sodium. Although it is not classed with the elements, it has the same characteristics as the alkali metals. The metal Ammonium has not yet been authoritatively isolated, but it is reported that Weyl succeeded in obtaining it as a dark-blue liquid, having a metallic lustre. Its composition is therefore only known by its characteristics in its compounds, which correspond with the chemical formula (NH_4) assigned to it. It is an univalent radical like potassium or sodium and its compounds or salts closely resemble them.

The Salts of Ammonium are mostly colorless and very soluble in water, they are volatilized at high temperatures, and when heated with the hydrates of potassium, sodium, or calcium are decomposed with evolution of ammonia gas.

The derivatives and Salts of Ammonium are extensively used in pharmacy, medicine, and the arts, the commercial basis of them being chiefly the waste "ammoniacal liquor" of gas works, which is neutralized either with sulphuric acid, forming sulphate of ammonium, or with hydrochloric acid, forming crude chloride of ammonium (sal-ammoniac), which may be converted into any of the ammonium compounds.

Ammonium Amalgam.—The nearest approach to the metal Ammonium is *Ammonium Amalgam*, which is made by dissolving potassium in mercury and adding a strong solution of ammonium chloride to it. It is a spongy metallic substance, which as soon as formed begins to decompose into ammonia, mercury and hydrogen.

144.

Ammonia.

Ammonia Gas—Hydrate of Ammonium.



Gaseous Ammonia was first made known by Priestley in 1785. It is known by its peculiar odor and by its property of

restoring the color of blue litmus which has been reddened by acids, or by forming a white cloud with the vapor of hydrochloric acid. In pharmacy its solution in water (which is known in the United States as water of ammonia and in Great Britain, France and Germany as solution of ammonia) is the only form in which it is available; but in the arts, gaseous ammonia is considerably employed. It is produced in nature by the decomposition of animal and some vegetable substances and is mainly supplied to commerce from the waste products of gas manufacture. It is retained for use in the form of some of its stable salts with acids.

It is strongly *alkaline*, and is sometimes called *animal alkali*, *volatile alkali*, etc.

It unites with nearly all acids to form stable salts, and dissolves freely in water — 1 volume of water dissolving nearly 700 volumes of the gas — but it escapes freely from its aqueous solution when exposed; hence the penetrating odor of water of ammonia. In the form of gas it is used by inhalation from its solution as a quick stimulant and restorative for syncope, collapse, etc., and as a domestic remedy for headache and many other ailments.

Amidogen — NH_2 .—This is a hypothetical body composed of one atom of nitrogen and two of hydrogen. As its name indicates, it is the generator of *amides*, which it forms by combining with other bodies.

Amides are compounds derived from Ammonia by replacing one or more of its atoms of hydrogen by an *acid* radical. All the known Amides are white crystalline solids, many of them having both acid and basic properties. They include most of the non-volatile alkaloids (see page 98) and the Ammonia derivatives of the haloid and ethereal salts, etc. They are known as *monamides*, *diamides* and *triamides* according to their formation and combination.

Amines are compounds derived from Ammonia by replacing one or more of its atoms of hydrogen with a *basic* radical. They consist of the volatile alkaloids (see page 98), the artificial alkaloids, the ammonia derivatives of the alcohol radicals and other hydrocarbons, etc. They are known as

monamines, *diamines*, or *triamines* according as the hydrogen is displaced from a single, double, or triple molecule of Ammonia.

Alkamides are Ammonia compounds intermediate between amines and amides, containing both acid and basic radicals.

145. Aqua Ammoniæ.

Water of Ammonia, U. S.—Solution of Ammonia, Br.

Although this preparation is properly included under the heading AQUÆ or LIQUORES, it is also given here because it is the basis of many of the Salts of Ammonium. The process of the 1870 U. S. P. was to mix muriate of ammonia (ammonium chloride) in small pieces with milk of lime in a retort connected with a cooled receiver by means of a glass tube extending beneath the surface of distilled water contained in the receiver. Heat being then applied the lime is converted into chloride of lime, liberating the ammonia gas which is distilled and dissolved in the water contained in the receiver.

The official strength of the U. S., Br. and German, water, liquor or solution of ammonia is 10 per cent. by weight of the gas. Its sp. gr. is 0.960. In German pharmacy it is often prescribed by its Latin name, "*Liquor Ammonii Caustici*."

It is supplied by manufacturers in carboys, and marked by some 16° and by others F.F.F. or 3 F. Other manufacturers mark the 20° ammonia F.F.F. or 3 F., so it will be seen that considerable confusion exists in regard to the F.'s, and they should never be taken as the standard of strength of the solution, the degree marks, only, being reliable.

In pharmacy both the 10 per cent. and the stronger solutions are used in making the official preparations, and in general use other strengths are employed; for druggists buy of manufacturing chemists water of ammonia varying all the way from 6 to 28 per cent. or more of the gas—the most frequently sold being the "FFF" or 20° Baumé, sp. gr. 0.933, containing 17½ per cent. of gas. To reduce the 20° or "FFF" ammonia to

the official 10 per cent. water of ammonia mix 16 ounces av. with 12 ounces av. of distilled water.

To reduce the 28 per cent. or stronger water of ammonia to the 10 per cent. strength, mix 16 ounces av. with $28\frac{4}{5}$ ounces av. of distilled water.

Uses.—In medicine water of ammonia is used externally as an application in the form of liniments, mixtures, etc., as a stimulant and counter-irritant for rheumatism, neuralgia, lameness, etc. Internally it is given very largely diluted as an antacid and stimulant, in doses of from 5 to 30 drops.

In the industrial arts and manufacturing of chemicals ammonia is extensively used either in the form of gas, solution, or salts.

146. Aqua Ammoniae Fortior.

Stronger Water of Ammonia, U. S.—Strong Solution of Ammonia, Br.

The U. S. official Stronger Water of Ammonia contains 28 per cent. of ammonia gas by weight, sp. gr. 0.900, and is marked 26°. The Br. Strong Solution of Ammonia contains 32.5 per cent. of the gas by weight, sp. gr. 0.891. There is no corresponding official German solution.

It is prepared in the same manner as the 10 per cent. solution, except that a greater percentage of gas is dissolved in the water.

Stronger Water of Ammonia is frequently employed as a vesicant and caustic, but is seldom given internally.

Ammonium Salts.

Ammonium forms salts with nearly all the mineral and vegetable acids. They are generally colorless and very soluble in water. A few only are official in the U. S., less in the Br., and still less in the G. P. Of those unofficial in the U. S. P. but few are used in medicine or pharmacy. The following are the official salts:

147. Ammonii Benzoas.*Benzoate of Ammonium.*

Benzoic Acid, 1 ounce av.

Water of Ammonia, about, 1½ fl.ounces.

Distilled Water, 2 fl.ounces.

Mix the water of ammonia with the distilled water and dissolve the benzoic acid in the mixture. Evaporate the solution by gentle heat, adding from time to time a little water of ammonia to maintain a slight excess of alkali.

Then set aside to crystallize and dry the crystals without heat.

Uses.—The Benzoate of Ammonium is somewhat used as a stimulant diuretic in kidney diseases. Dose 5 to 20 grains.

148. Ammonii Bromidum.*Bromide of Ammonium.*

This salt may be made by neutralizing hydrobromic acid with ammonia, evaporating the solution and crystallizing; by decomposing bromide of potassium with ammonium sulphate in the presence of alcohol, and by many other processes.

Uses.—Bromide of Ammonium is used as a hypnotic and sedative, and is by many preferred to potassium bromide. Dose from 10 to 60 grains or more.

149. Ammonii Carbonas.*Carbonate of Ammonium—Sal Volatile—Hartshorn—Sesqui-Carbonate of Ammonium.*

As prepared for commerce the Carbonate of Ammonium is a mixed salt, consisting of one molecule of acid ammonium carbonate and one of *ammonium carbamate*. It is generally

prepared by subliming chloride or sulphate of ammonium with chalk or calcium carbonate and resubliming the product. It is a volatile and pungent ammonia salt—the only one having the odor of ammonia gas. Exposed to the air it soon loses the odor of ammonia and becomes inert, hence it must be carefully preserved in air-tight packages.

Uses.—In pharmacy it is used in making aromatic spirit of ammonia, solution of acetate of ammonium and several other preparations and in the preparation of *smelling salts*. In medicine it is given as a stimulant in doses of 3 to 5 grains, generally in some mucilaginous syrup. It is frequently given combined with expectorants in cough syrup. It is also employed in cleaning compounds and for culinary purposes.

150. Ammonii Chloridum.

Chloride of Ammonium—Muriate of Ammonia—Sal Ammoniac.



This salt is generally prepared, commercially, from the ammoniacal liquid obtained from gas works, and known as "*gas liquor*," by neutralizing with hydrochloric acid and subliming the salt thus obtained. It is inconvenient for pharmaceutical use as it comes into market, but may be granulated and purified as follows:

Chloride of Ammonium, in small pieces,	20 tr.ounces.
Water of Ammonia,	5 fl.drachms.
Water,	2 pints.

Dissolve the salt in the water by the aid of heat in a porcelain vessel, add the water of ammonia, and continue the heat for a short time, filter the solution while hot and evaporate to dryness with constant stirring at a moderate heat until it granulates.

Uses.—The Chloride of Ammonium is used as a stimulant, especially in cough mixtures, and externally in "solution," for lameness, etc. The dose internally is from 2 to 10 grains.

151.

Ammonii Iodidum.*Iodide of Ammonium.*

This is made by decomposing a concentrated solution of iodide of potassium with sulphate of ammonium. Sulphate of potassium remains undissolved and Iodide of Ammonium is obtained from the filtered liquid by evaporation and crystallization.

Uses.—The Iodide of Ammonium is similar to iodide of potassium and is used for the same purposes. It is alterative and resolvent. Dose 2 to 5 grains.

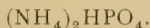
152.

Ammonii Nitras.*Nitrate of Ammonium.*

Nitrate of Ammonium may be made by adding carbonate of ammonium to nitric acid as long as effervescence occurs, then filtering the solution, concentrating and crystallizing or evaporating until all the water is driven off, when it may then be “granulated” by stirring until cool, or “fused” by allowing to cool without stirring.

Uses.—This is sometimes used as a diuretic, but is chiefly employed for the preparation of nitrous oxide or “laughing gas,” which is made from it simply by heating the Nitrate of Ammonium and purifying the gas by running through a wash-bottle.

153.

Ammonii Phosphas.*Phosphate of Ammonium.*

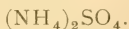
This may be made by adding stronger water of ammonia to phosphoric acid (50 per cent., 1880,) until slightly in excess, then concentrating the liquid by evaporation and crystallizing.

A little water of ammonia should be added while evaporating to keep the solution slightly alkaline.

Uses.—This is used as a remedy for rheumatism and gout in doses of 15 to 30 grains.

154. Ammonii Sulphas.

Sulphate of Ammonium.



The common source of this salt is gas liquor or fetid bone-spirit, which is saturated with sulphuric acid and the salt obtained repeatedly crystallized to obtain pure. It is also made by adding gas liquor to powdered sulphate of calcium, which is decomposed, leaving calcium carbonate precipitated, while the Sulphate of Ammonium remains in solution. The solution is then evaporated and crystallized.

Uses.—The Sulphate of Ammonium is used as the basis of most of the ammonium salts and as a source of ammonia gas in making water of ammonia, because of its cheapness. It is not employed in medicine.

155. Ammonii Valerianas.

Valerianate of Ammonium.



This salt is prepared by passing dried gaseous ammonia into monohydrated valerianic acid. A process for making it was official in the U. S. P. 1870; but it is generally supplied by manufacturing chemists who have facilities for preparing it. It is chiefly used in pharmacy for making Elixir of Valerianate of Ammonium.

Uses.—In medicine Valerianate of Ammonium is employed, usually in the form of elixir or solution, in hysteria, delirium, neuralgia, and nervous diseases. It is a nervine. The usual dose is from 2 to 20 grains.

Other Salts of Ammonium.

Besides the foregoing official Salts of Ammonium, the following are sometimes used:

156. Ammonium Arseniate — $(\text{NH}_4)_2\text{H,AsO}_4$.—Made by saturating a concentrated solution of arsenious acid with water of ammonia and allowing to evaporate spontaneously. A soluble salt of arsenic frequently employed in medicine.

157. Ammonium Bicarbonate — NH_4HCO_3 .—Add one part of powdered carbonate of ammonium to two parts of water, agitate and decant the liquid, the residue remaining is the Bicarbonate of Ammonium.

158. Ammonium Bichromate — $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$.—Made by adding chromic acid to stronger water of ammonia to saturation, concentrating and crystallizing.

159. Ammonium Borate — $2(\text{NH}_4\text{HB}_2\text{O}_4) \cdot 3\text{H}_2\text{O}$.—Dissolve one part of boric acid in three parts of warm water of ammonia, 10 per cent., allow to cool slowly and crystallize. Used for the same purposes as borate of sodium or common borax.

160. Ammonium Carbazotate or Picrate.—Add carbazotic (picric) acid to stronger water of ammonia to neutralize, allow to evaporate spontaneously and crystallize.

161. Ammonium Citrate — $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7 + 3\text{H}_2\text{O}$.—Add citric acid to water of ammonia to neutralize, concentrate and crystallize. This assists in dissolving salts of quinine and other salts of alkaloids.

162. Ammonium Fluoride — NH_4F .—Made by saturating hydrofluoric acid with water of ammonia.

163. Ammonium Formate — NH_4CHO_2 .—Neutralize formic acid with water of ammonia, concentrate and crystallize.

164. Ammonium Gallate.—Add gallic acid to stronger water of ammonia to saturation, concentrate and crystallize.

165. Ammonium Hydrosulphide or Sulphide — NH_4HS .—By passing sulphuretted hydrogen gas through water of ammonia a solution may be obtained, or by mixing gaseous ammonia with sulphuretted hydrogen gas at low temperature crystals are formed.

166. Ammonium Hypophosphite.—By neutralizing water of ammonia with hypophosphorous acid, concentrating and crystallizing. This is used in combination with other hypophosphites in syrups and solutions.

167. Ammonium Molybdate.—Made by neutralizing molybdic acid with ammonia. *Phosphomolybdate of Ammonium* is a compound with phosphoric acid. These salts are used as tests for organic bases, which they precipitate.

168. Ammonium Nitrite — NH_4NO_2 .—To a solution of nitrate of silver add a solution of chloride of ammonium and evaporate the clear solution poured from the precipitate over sulphuric acid to dryness. This is used as a diuretic.

169. Ammonium Oxalate — $(\text{NH}_4)_2\text{C}_2\text{O}_4$.—To a hot solution of oxalic acid add carbonate of ammonium until neutralized, concentrate the solution and crystallize. It is used in chemistry as a test for calcium, with which it produces a white precipitate soluble in nitric acid.

170. Ammonium Phenylate or Phenylamine is produced in small quantities when carbolic acid is heated in sealed tubes with ammonia. It is known in the market as aniline, or "aniline oil," the base of the aniline dyes. See Aniline.

171. Ammonium Salicylate — $\text{NH}_4\text{C}_7\text{H}_5\text{O}_3$.—Add salicylic acid to water of ammonia until neutralized, then evaporate and crystallize. Used in rheumatism and neuralgia the same as salicylate of sodium.

172. Ammonium Succinate.—Dissolve 1 part of succinic acid in 4 parts of water, neutralize with carbonate of ammonium, in slight excess, evaporate and crystallize.

173. Ammonium Sulphite — NH_4HSO_3 .—This is made by passing sulphurous acid gas into an alcoholic solution of ammonia and collecting the precipitate.

174. Ammonium Sulphocyanate — NH_4CNS .—Neutralize hydrosulphocyanic acid with ammonia, or dissolve bisulphide of carbon in alcohol and heat in the presence of water of ammonia, then concentrate by evaporation and crystallize.

175. Ammonium Vanadate.—Neutralize vanadic acid with ammonia, concentrate and crystallize.

Many other Ammonium Salts are formed with various acids and acid compounds, but those mentioned are all that are generally used in pharmacy.

AMYL.



The radical of the Amyl series of compounds of which "fousel oil" is the hydrate, is known as *Amyl*. Its compounds form an interesting series of products, somewhat used in medicine and considerably employed in making artificial fruit flavors. The compounds of Amyl are nearly all prepared from its hydrate — Amylic Alcohol ($\text{C}_5\text{H}_{11}\text{HO}$), or, as it is commercially known, Fousel or Fusel Oil. This is combined

with various acids and forms oxides or ethers, which are separated by distillation in the same manner as ethyl ethers. (See page 78.) Its compounds, however, are not known commercially as ethers, but by the acids with which they are combined, as Acetate of Amyl, etc. Nitrite of Amyl is the only U. S. official compound, but the Br. P. includes Amylic Alcohol also. (See page 95.)

The following are the preparations of Amyl generally known and employed in pharmacy and the manufacture of fruit flavors.

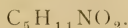
Amyl Acetate.....	$C_5H_{11}C_2H_3O_2$	Acetate of Amyl.
Amyl Butyrate....	$C_5H_{11}C_4H_7O_2$	Butyrate of Amyl.
Amyl Chloride.....	$C_5H_{11}HCl$	Chloride of Amyl.
Amyl Formate.....	$C_5H_{11}CHO_2$	Formate of Amyl.
Amyl Hydrated Oxide*	$C_5H_{11}HO$	Fusel Oil, Amyloxide.
Amyl Iodide.....	$C_5H_{11}I$	Iodide of Amyl, Iodamyl.
Amyl Nitrate.....	$C_5H_{11}NO_3$	Nitrate of Amyl.
Amyl Nitrite.....	$C_5H_{11}NO_2$	Nitrite of Amyl.
Amyl Valerianate.....	$C_5H_{11}C_5H_9O_2$	Valerianate of Amyl.

Of the foregoing, the Acetate of Amyl, by the resemblance of its odor to the jargonelle pear, is often called *Pear Oil*, and the valerianate, by its resemblance to the odor of apples, is called *Apple Oil*. The others are variously combined to make fruit flavors.

Amylene — C_5H_{10} .—This is an etherial liquid made from Amylic Alcohol by abstracting from it the elements of water. It was formerly used as a substitute for ether, but is now no longer employed in medicine.

176. Amyl Nitris, U. S., Br.

Nitrite of Amyl.



This is a volatile liquid made by adding to purified Amylic Alcohol in a capacious glass retort an equal volume of nitric acid, and gradually heating to near the boiling point when the reaction will proceed spontaneously. The distillate is collected until the temperature in the retort rises to 100° C. (212° F.)

* See Alcohol Amylicum, page 95.

and then discontinued. The distillate is agitated with water rendered alkaline with potassa or lime, and the oily layer which separates upon standing is distilled, the portion coming over between 95° and 100° C. being the Nitrite of Amyl. Other Amyl Ethers are made in a similar manner.

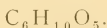
Nitrite of Amyl Pearls are made by enclosing a few drops of Nitrite of Amyl in thin glass capsules. These are broken in the handkerchief when desired to be used by inhalation for headache or other disorders.

Uses.—Nitrite of Amyl is used medicinally by inhalation for spasmodic diseases, asthma, epilepsy, etc., and for nervous headache. It is sometimes given in doses of $\frac{1}{2}$ to 1 minim, much diluted.

177.

AMYLUM.

Starch.



This substance is more familiar to the grocer than the druggist. It exists in plants, and is obtained from various grains, tubers, roots, etc., by separating it in various ways from the other substances with which it is associated. The starch obtained from various substances does not differ in chemical composition, but only in physical appearance. The U. S. P. directs starch obtained from the seed of common wheat (*Triticum vulgare*); the Br. P. mentions wheat, corn or rice starch as official; but in pharmaceutical practice starch from almost any source is used, as the druggist uses whatever is furnished by the manufacturers. It is prepared by manufacturers by grinding the grain to a fine powder, washing it with an abundance of water, allowing the starch to settle, draining off the water and drying.

In the industrial arts starch is extensively employed for many purposes. The manufacture of *grape sugar* or *glucose* from starch has been developed to an important industry in this country. *Dextrin* is also a derivative of starch considerably used in manufacturing and the arts.

In pharmacy starch is employed as a dusting for pills, sup-

positories, etc., an ingredient in toilet powders and for making several preparations. In medicine starch is made into demulcent food for invalids and is used in the form of dust, decoction or glycerite, externally, to allay inflammation, prevent chaffing, etc. Some of its compounds are used internally to prevent the irritation of caustic medicines.

Varieties of Starch.—*Wheat, rye, corn, rice* and *potato starch* are the varieties usually known in the market as starch. Starch obtained from any or all of these substances is known as laundry starch, but “corn starch” is put up in packages especially as an article of diet.

Arrowroot (Maranta) is a starch obtained from the rhizome of *Maranta arundinacca*. It was formerly official, but has now been deleted. It is used as a nutritious food for invalids. Much of the “arrowroot” that is sold, however, consists only of our common varieties of starch. *Sago*, a starch prepared from the pith of the sago palm, and *Tapioca*, prepared from the tubers of the tapioca or cassava plant, are familiar varieties of starch used as food. *Rice* and *Pearl-Barley*, as they are sold by grocers, consist mainly of starch.

178. Amylum Iodatum, U. S.

Iodized Starch— Iodide of Starch.

Starch, 95 parts, or 418 grains.

Iodine, 5 parts, or 22 grains.

Distilled Water, a sufficient

quantity to make . . . 100 parts, or about 1 oz. av.

“Triturate the iodine with a little distilled water, add the starch gradually, and continue triturating until the compound assumes a uniform blue color approaching black. Dry it at a temperature not exceeding 40° C. (104° F.), and rub it to a fine powder.”

There seems to be some difference of opinion as to whether this is a chemical or mechanical compound.

Uses.—This is given internally in doses of from two to four drachms, its advantage being that iodine may be freely administered without danger of gastric or intestinal irritation.

Soluble Iodide of Starch.—A soluble Iodide of Starch may be made by dissolving 180 grains of iodine in 5 fl.drachms of ether and triturating the solution with 3 troyounces of starch until the ether has evaporated, then heating by water-bath for half an hour with occasional stirring. The starch is thus converted into dextrin and becomes soluble. It contains when completed about 4 per cent. of iodine, and may be made into solution or syrup, or given in powder like the above.

179.

ANILINA.*Aniline — Aniline Oil — Phenylamine.*

This alkaloid was first obtained from indigo by dry distillation, and derives its name from *Anil*, a specie of plants from which indigo is obtained. It was afterward obtained from coal-tar, benzene and other products of coal and petroleum distillation and is now mainly obtained from these sources. It is a colorless, oily, inflammable liquid, the base of the various well-known salts known in the market as aniline dyes. Druggists formerly had quite a sale for these aniline salts under various fanciful names, but since the introduction of proprietary package dyes they are but little called for, but are somewhat used in pharmacy for making colors and inks. The process for obtaining Aniline is complicated and varies considerably with the substance from which it is derived; therefore it is not repeated here. Aniline forms salts with most of the acids and negative elements, which give a great variety of beautiful colors known as "Aniline Dyes," the manufacture of which constitutes a great industry. Aniline and its compounds are not used in medicine. The following are a few of the best known Aniline Dyes:

180. Red Aniline or Fuchsine, also known as *Magenta*, *Solferino*, *ros-aniline*, *roséine*, *rubine* and by many other similar names, is made by various processes, which consist in oxidizing aniline oil by means of acids or other oxidizing agents. It is the basis of most of the other aniline dyes.

Many modifications of the red color are produced by different combinations and processes.

181. Blue Aniline is made both soluble and insoluble of various shades of color. The former is known as *soluble* or *alkali blue*, *Nicholson's blue*, *diphenylamine blue*, etc.; the latter as *Bleu de Lyons*, *Bleu de Nuit*, *blueine*, *Mulhouse blue*, *Aldehyde blue*, *triphenyl rosaniline*, etc.

182. Violet Aniline, *Mauvine*, *Purple Aniline*, *Etc.*—A great variety of violets, ranging from bluish to redish, are produced by various combinations. The most familiar are *Hoffman's Violets*, made by acting on fuchsine with methel or ethyl iodide or bromide. Those having a reddish shade are marked Hoffman's Violet R., while those having a blue shade are known as Hoffman's Violet B. or BB. or BBB., etc.

183. Green Aniline.—A variety of green shades are also made by variously combining yellows and blues, or by acting upon fuchsine with various substances. They are variously known as *aldehyd green*, *iodine green*, *methyl green*, etc.

184. Black Aniline, Negrosine, or Gray Aniline.—This is made by acting upon mauvine with strong sulphuric acid and aldehyd, and by other cheaper methods. All tints from light gray to black may be produced with this dye. It is the basis of many of the popular black inks.

185. Yellow Aniline and Orange Aniline are mostly obtained from the products of fuchsine manufacture, *chrysaniline*, etc.

186. Brown Anilines are made by heating fuchsine and formic acid together, and by other methods.

ANTIMONIUM — ANTIMONY.

Symbol, Sb. (Stibium); Atomic weight, 120; Sp. gr. 6,715.

The metal Antimony occurs in nature to a small extent but is generally found alloyed or associated with other metals or combined with sulphur. The common commercial source being Sulphide of Antimony, Gray Antimony, or stibnite (Sb_2S_3 .) This ore was called by the alchemists *lupus metallorum*, and metallic Antimony was named by them, *regulus*, or *regulus of Antimony*.

Metallic Antimony is a bright, silver-gray metal, very brittle, easily pulverized, and is one of the most important alloy-metals we possess. Its salts are considerably used in pharmacy and medicine.

The following are the principal alloys in which Antimony is employed:

187. Babbitt-Metal.—The best Babbitt anti-friction metal, which is used as boxes for the journals or axles of machinery, is composed of tin, 10 parts; copper and antimony, each 1 part. A cheaper alloy is made by using a portion of lead in place of tin.

188. Britannia-Metal.—The best Britannia-Metal is composed of tin, 81 parts; antimony, 16 parts; copper, 2 parts; zinc, 1 part. Other grades of Britannia are required to be softer for various purposes, and a smaller proportion of Antimony is used. Lead is also used in cheaper grades in place of a portion of the tin.

189. Pewter.—The best plate pewter is made with tin, 85 parts; Antimony, 8 parts; copper, 5 parts; bismuth, 2 parts. Cheap Pewter is made of tin and lead only.

190. Type-Metal.—This is made of lead, 80 to 83 parts, and Antimony, 17 to 20 parts. Other metals are often added, and varying proportions of lead and Antimony used.

Lead 75 parts, Antimony 20 parts, tin 5 parts; or, lead 70 parts, Antimony 25 parts, tin 5 parts, are good proportions. Many type-founders use a small proportion of copper in the alloy.

191. Stereotype-Metal is made of lead, 112 parts; Antimony, 18 parts; tin, 3 parts.

Of the many salts and preparations of Antimony that were formerly used in medicine but few are now employed.

The following are the official salts:

192. Antimonii et Potassii Tartras.

*Tartrate of Antimony and Potassium — Tartar Emetic, U. S. —
Tartrated Antimony, Br.*



This double salt is the most important medicinal preparation of Antimony. It may be made by the old official process, which is as follows:

Oxide of Antimony, in very fine powder, 2 ounces.

Bitartrate of Potassium, in very fine

powder, 2½ ounces.

Distilled Water, 18 ounces.

To the water, heated to boiling in a glass (or porcelain) vessel, add the powders previously mixed and boil for an hour.

Then filter the liquid while hot and set aside that crystals may form. Lastly, dry the crystals and keep them in a well-stopped bottle.

The British process is similar, except that the powders are first mixed together, moistened with water to a pasty mass and allowed to stand twenty-four hours before boiling with the remainder of the water, the boiling being continued only 15 minutes.

This salt is found in the market generally in the form of a white powder, familiarly known as Tartar Emetic. It is soluble in about 17 parts of cold or 3 parts of boiling water.

Uses.—Tartar Emetic is given in doses of from $\frac{1}{2}$ to 1 grain, repeated if necessary, as an Emetic. In doses of $\frac{1}{40}$ to $\frac{1}{3}$ grain it is used as a diaphoretic and alterative. It is much prescribed and used as an ingredient in cough medicines, and is also employed for making irritating ointments and plasters. As an *antidote* for poisoning by overdose of this salt, some solution containing tannin should be given freely. Strong tea will do. Tannin forms with it an insoluble salt.

193.

Antimonii Oxidum.

Oxide of Antimony.



This is *trioxide* of Antimony or Antimonious Oxide. It is made by treating Sulphide of Antimony with hydrochloric acid, by the aid of heat, then adding nitric acid and water, and filtering, which makes a solution of Chloride of Antimony. The filtrate is then poured into a large quantity of water, which precipitates *Oxychloride of Antimony*. To convert this into the oxide it is treated with water of ammonia for two hours, and then washed with distilled water to remove chloride of ammonium.

The British Pharmacopœia directs it to be made by precipitating 16 fl.ounces of solution Chloride of Antimony by pouring it into 2 gallons (Imperial) of water, washing the precipitate with distilled water, then adding a solution of 6 ounces of carbonate of sodium in 2 pints (Imperial) of water,

leaving them in contact half an hour with frequent stirring, collecting the precipitate and washing with boiling distilled water.

Uses.—The Oxide of Antimony is used chiefly for making other antimonial preparations. The only form in which it is administered unchanged is in antimonial powder.

194. Antimonii Sulphidum.

Sulphide or Sulphuret of Antimony.



Native Sulphide of Antimony, purified by fusion and as nearly free from arsenic as possible—U. S.

This is the commercial or crude Sulphuret of Antimony from which the other antimonial preparations are derived. It is considerably used as an ingredient of condition powders.

195. Antimonii Sulphidum Purificatum.

Purified Sulphide of Antimony—Black Antimony.

This is the same as the foregoing, except that it is purified by dissolving out whatever arsenious sulphide is present with ammonia.

Sulphide of Antimony, 16 ounces av.

Water of Ammonia, 8½ fl.ounces.

Water, a sufficient quantity.

Reduce the Sulphide to a very fine powder; add the water of ammonia, macerate for five days with frequent agitation; then pour off the water of ammonia. Wash the residue thoroughly with several portions of water, and, finally, dry by heat.

Uses.—Whenever sulphide of antimony is directed to be used in medicine, the preparation thus purified should be employed. It is considerably used in making horse and cattle powders.

196. **Antimonium Sulphuratum.***Sulphurated Antimony.*

Purified Sulphate of Antimony, . . . 2 ounces av.

Solution of Soda, 22½ fl.ounces.

Distilled Water.

Diluted Sulphuric Acid, each a sufficient quantity.

Mix the Antimony with the solution of Soda and 4 pints of distilled water, and boil the mixture over a gentle fire for two hours, constantly stirring and adding a little distilled water occasionally to maintain the same volume. Strain the liquid then through a double muslin strainer and drop into it while yet hot diluted sulphuric acid so long as it produces a precipitate. Wash the precipitate with hot distilled water until all traces of sulphuric acid are removed, then dry, and reduce to a fine powder. The powder is composed of sulphide and Oxide of Antimony.

Uses.—This is given as an alterative and diaphoretic in small doses and an emetic in doses of from 2 to 5 grains. It is an ingredient of the well-known Plummer's Pills, which are official.

Other Salts of Antimony.

The foregoing are all the Salts of Antimony that are used to any extent, in pharmacy, but the following unofficial salts are sometimes employed, and are therefore mentioned:

197. Bromide of Antimony — SbBr_3 .—Made by adding dry Antimony to bromine in a retort, agitating until the reaction is complete, then purifying by distillation and collecting the crystals.

198. Fluoride of Antimony — SbF_3 .—By distilling Antimony and fluoride of mercury together and collecting the white mass.

199. Iodide of Antimony — SbI_3 .—By combining Antimony and iodine and allowing them to remain in combination until the reaction is completed.

200. Oxides of Antimony.—Besides the official oxide (trioxide) of Antimony, it forms a *tetroxide*, Sb_2O_4 , known as *antimonious acid*, and a *pentoxide* Sb_2O_5 known as *antimonic anhydride*.

201. Oxychloride of Antimony — SbOCl —*Powder of Algaroth*.—By pouring solution of Chloride of Antimony into a considerable quantity of water, this salt is precipitated.

202. Oxysulphide of Antimony--*Kermes Mineral, Golden Sulphide of Antimony*.—By boiling one troyounce of Sulphide of Antimony for one hour with 16 pints of water and 23 troyounces carbonate of sodium, then allowing to stand twenty-four hours, collecting the precipitate, washing and drying. It is a mixture of sulphide and oxide of Antimony; was formerly official but is now seldom used. Uses same as Sulphurated Antimony.

203. Pentasulphide of Antimony— Sb_2S_5 .—By passing hydrosulphuric acid gas through antimonious anhydride suspended in water until the reaction is complete. This is similar in composition to the following:

204. Sulphantimoniate of Antimony—*Schlippe's Salt*.—By dissolving 70 parts of carbonate of sodium in 250 parts of water, boiling and mixing with 26 parts of lime mixed with 80 parts of water; then adding 36 parts of levigated Sulphide of Antimony and 7 parts of sublimed sulphur, boiling until the gray color disappears, filtering and crystallizing.

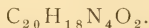
205. Sulphate of Antimony— $\text{Sb}_2(\text{SO}_4)_3$.—By boiling Antimony with strong sulphuric acid, and collecting the white mass.

206. Vitrified Antimony--*Glass of Antimony*.—By roasting Sulphide of Antimony first in a shallow vessel, and then melting it in a crucible, and pouring it upon an iron plate.

Besides the foregoing, some other preparations and compounds of Antimony are occasionally wanted. *Butter of Antimony* is the *Solution of Terchloride of Antimony* (which see). *Crocus of Antimony* is made by fusing equal parts of Black Antimony and saltpetre together; *Liver of Antimony* by fusing 7 parts of Black Antimony with 2 parts of dry carbonate of sodium; *Ethiops of Antimony* by triturating 1 part of mercury with 2 parts of Black Antimony until the mercury is extinguished.

207.

ANTIPYRIN.



This is made by Meister, Lucius & Brüning, of Höchst on the Rhine, after a patented process, by heating methyl-oxy-chinizin with an excess of phenyl-hydrazin to boiling, and collecting the white crystalline powder which forms. A similar preparation called *Dr. Knorr's Antipyrine* is now made in this country. It is used to reduce the temperature, and as a general sedative in febrile conditions. The dose is from 15 to 40 grains.

Antifebrin is a similar proprietary compound similarly indicated and used in febrile conditions.

AQUÆ — WATERS.

As applied to pharmacy in this country and Great Britain the term *Aquæ* or *Waters* includes only aqueous solutions of aromatic or volatile substances, either with or without the aid of some insoluble medium by which their solution may be facilitated.

These waters are more commonly called “medicated waters,” but with one or two exceptions they are hardly entitled to that appellation. They are used in pharmacy for making a few medicinal preparations, and in medicine are prescribed as vehicles or aromatic dilutents for more active remedies.

The United States Pharmacopœia includes in the waters, *aqua ammoniæ* and *aqua chlori*, which are solutions of gas in water; the British Pharmacopœia includes these among the solutions, which is, no doubt, the more proper classification. In German pharmacy several preparations are classed among the waters that more properly belong with the solutions; and in French Pharmacy, a large number of preparations are included in the “Eaux” which should be in entirely different departments. Under this heading, therefore, only those solutions of volatile substances which are naturally classed with the waters as understood in this country and Great Britain will be mentioned.

The processes by which they are made are as follows :

208.

By Solution.

a. Of those made with cold water, the solutions of gaseous ammonia and chlorine; of chloroform, carbolic acid and creosote; of bitter almond oil, and tar may be mentioned. With the exception of the gaseous solutions, which require special apparatus, the remaining waters are made simply by agitating the substances occasionally for several days with cold water.

b. Hot water dissolves the volatile oils much more readily than cold, and very good waters may be made by thoroughly agitating the volatile oil directed in hot water, allowing to

stand for several hours, and filtering. Nearly all the waters in which volatile oils are used can be satisfactorily made in this manner.

209. By Distillation.

a. From fresh or dried aromatic fruit, flowers, leaves, bark, or other parts of plants. The substance is introduced with water into a still, and one half or less of the water (which is charged with the volatile constituents of the substances) is distilled over. Or steam is passed through the substances contained in a still, the vapor condensed, and the liquid separated from oily particles by filtration. Most of the waters of the British Pharmacopœia are made in this manner.

b. From essential oils of plants, by mixing them with a quantity of sand or some other substance to separate the oily particles, then adding water and distilling over about half the quantity used. The proportion is generally one fl.drachm of essential oil, 4 ounces of sand, and one gallon of water. Distill 4 to 6 pints. This is a very good way to make Distilled Waters. They generally keep better than when made from the fruit, flowers, leaves, etc.

Distillation, whenever it is admissible, is to be recommended above all other processes for the preparation of *Waters*. The process and apparatus are further described on page 26. When made by distillation, the distilled waters while still warm should be put in small bottles, sealed, and put in a cool place. They will then keep for years.

210. By Filtration or Percolation.

a. The process formerly official for making most of the *Waters* of the United States Pharmacopœia, was to rub 30 minims of the essential oil with 60 grains of carbonate of magnesium, then with 2 pints of water, and filter. This was generally a very satisfactory process, but it was thought desirable to change the process in the 1880 revision by substi-

tuting cotton as a means of mechanically dividing the oil to aid in its solution. The former process is, however, very generally used in preference to the latter. Other substances besides carbonate of magnesium, as phosphate of calcium, powdered pumice-stone, kaolin, precipitated chalk, etc., are sometimes used, but they have no advantages over it.

b. The 1880 United States Pharmacopœia directs many of the *Waters* to be made by adding the essential oil gradually to cotton, picking it thoroughly to pieces to distribute the oil evenly, then packing the cotton in a conical funnel, and percolating with water until the desired quantity is obtained. The cotton (which is preferably absorbent cotton) is best impregnated with the essential oil by the use of cards such as are employed for carding wool. Thirty minims of the oil with 60 grains of cotton is the proper quantity to make two pints of water.

The following are the *Waters* generally used and prescribed in this country.

For Water of Ammonia, see Ammonia.

For Chlorine Water, see Chlorine.

211. Aqua Amygdalæ Amaræ.

Bitter Almond Water.

Oil of Bitter Almonds, 15 minims.

Distilled Water, 2 pints.

Dissolve the oil in the water by agitation (208 *a*), and filter through a well-wetted filter.

This is an agreeably flavored vehicle.

The German Pharmacopœia directs this water to be made from Bitter Almonds 12 parts by first bruising and pressing out as much as possible of the fixed oil, then powdering and mixing with 80 parts of water, and 1 part of alcohol, and allowing to stand 12 hours. Eleven parts are then to be carefully distilled off into a well cooled receiver, containing one part of alcohol. This is then to be assayed to determine the amount of hydrocyanic acid, and the distillate so diluted with a mixture of 1 part of alcohol mixed with 5 parts of water, that 1 part of hydrocyanic acid will be contained in 1,000 parts of the finished liquid.

212. Aqua Anethi, Br.*Dill Water.*

Dill Fruit, bruised, 1 pound av.
 Water, 20 pounds av.

Distill 10 pounds, (209 *a*.)

This very much resembles Anise Water. It is seldom used in this country, but is much prescribed in Great Britain.

213. Aqua Anisi, U. S.*Anise Water.*

Oil of Anise, 30 minims.
 Carbonate of Magnesium or Cotton, . 60 grains.
 Distilled Water, 2 pints.

Make by rubbing the oil with the magnesium or picking with the cotton, adding the water and filtering or percolating as directed (210 *a* or *b*.) It may also be made by mixing 1 fl.drachm of oil with 4 ounces of sand and 8 pints of water, and distilling 4 pints (209 *b*.)

The British Pharmacopœia directs :

Anise Fruit, bruised, 1 pound av.
 Water, 20 pounds av.

Distill 10 pounds, as directed (209 *a*.)

Anise Water is used as a vehicle for medicines, especially for children.

214. Aqua Aurantii Florum.*Orange Flower Water.*

The United States Pharmacopœia directs 40 parts of recent Orange Flowers and 200 parts of water to be mixed, and 100 parts to be distilled.

Orange Flower Water is seldom, if ever, made in this country. As imported, it is known as Triple Orange Flower Water. By diluting with two parts of distilled water, ordinary Orange Flower Water is made.

An inferior Orange Flower Water may be made by rubbing 20 minims of Oil of Orange Flowers (Oil of Neroli) with 60

grains carbonate of magnesium, adding 2 pints of water, and filtering.

A better preparation may be made by mixing 30 minims of Oil of Orange Flowers (Neroli) with 4 ounces of sand and 6 pints of water, and distilling 3 pints.

Neither of these, however, represent the true flavor of the water distilled from the flowers.

Orange Flower Water is used in a few medicinal preparations and elixirs, but chiefly in toilet preparations, etc.

215. Aqua Camphoræ.

Camphor Water (U. S., 1880).

Camphor,	120 grains.
Alcohol,	$\frac{1}{2}$ fl.ounce.
Cotton,	$\frac{1}{2}$ ounce.
Distilled Water,	2 pints.

Dissolve the Camphor in the alcohol; moisten the cotton with the solution; allow the alcohol to evaporate; pack in a percolator, and add water until 2 pints have passed.

The 1870 United States Pharmacopœia directed 120 grains of Camphor to be rubbed with 40 minims of alcohol, then with 240 grains of carbonate of magnesium, and then percolated with water until 2 pints were obtained.

The British Pharmacopœia directs $\frac{1}{2}$ ounce av. of Camphor to be crushed and enclosed in a muslin bag and kept at the bottom of a bottle containing 10 pounds of distilled water (by means of a glass rod) for at least two days before using, and then pour off the solution as required for use.

Camphor Water is used as a mild antispasmodic, in doses of $\frac{1}{2}$ to 1 fl.ounce, and as an addition to many medicines.

216. Aqua Carbolisata, P. G.

Carbolic Acid Water.

Liquefied Carbolic Acid (29),	33 parts.
Water,	967 parts.

Mix them.

This was formerly official in the United States Pharmacopœia but has been deleted.

217. Aqua Carui, Br.*Caraway Water.*

Caraway Fruit, bruised,	1 pound av.
Water,	20 pounds av.

Distill 10 pounds as directed, (209 a.)

It may also be made by mixing 1 fl.drachm of Oil of Caraway Seed with 4 ounces of sand and 8 pints of water, and distilling 4 pints.

This is official only in the British Pharmacopœia. It is a pleasantly flavored water like Anise or Dill.

218. Aqua Chloroformi, Br.*Chloroform Water.*

Chloroform,	1 fl.drachm.
Distilled Water,	25 fl.ounces.

Put them in a quart bottle closely stopped and shake them together until the Chloroform is entirely dissolved.

This Solution of Chloroform is used as a mild sedative in doses of $\frac{1}{2}$ to 2 fl.ounces.

219. Aqua Cinnamomi.*Cinnamon Water (U. S., 1880).*

Oil of Cinnamon,	30 minims.
Cotton,	60 grains.
Distilled Water,	2 pints.

Add the oil to the cotton; pick, pack, and percolate with the water; (210 b.)

The 1870 United States Pharmacopœia directed 30 minims of Cinnamon Oil to be rubbed with 60 grains carbonate of magnesium, and then with 2 pints of distilled water, and filtered. The 1880 preparation is to be preferred.

The British Pharmacopœia directs 20 ounces av. of Cinnamon Bark, bruised, to be mixed with 20 pounds of water, and 1 gallon to be distilled, (209 a.) It may also be made by mixing 1 fl.drachm of Cinnamon Oil with 4 ounces of sand and

8 pints of water, and distilling 4 pints. This makes a superior Cinnamon Water.

Cinnamon Water is used in making several preparations and is much prescribed as an adjuvant or dilutent for other medicines. It may be given as a mild stimulant in doses of 1 fl.ounce.

220. Aqua Creasoti, U. S.

Creasote Water.

Creasote, 73 grains.

Distilled Water, 1 pint.

Mix, agitate, and filter through a well-wetted filter. This is very similar to carbolic acid water.

221. Aqua Destillata.

Distilled Water.

Water, 1,000 parts or 15 pints.

Distill the water from a suitable apparatus, throwing away the first pint and collecting the next 12 pints that are distilled over. Preserve in full, well-stopped bottles.

222. Aqua Fœniculi.

Fennel Water.

Oil of Fennel, 15 minims.

Carbonate of Magnesium or Cotton, . . . 60 grains.

Distilled Water, 2 pints.

Rub the oil with the magnesium, or pick with the cotton; add water, and filter or percolate as directed, (210 *a* or *b*.)

The British and German Pharmacopœias direct this to be made by distillation, as follows:

Fennel Fruit, bruised, 1 pound av.

Water, 20 pounds av.

Distill 10 pounds.

It may also be made by mixing 1 fl.drachm of Oil of Fennel with 4 ounces of sand and 8 pints of water, and distilling 4 pints.

Fennel Water is used as a pleasant vehicle and dilutent, the same as Anise.

223. Aqua Gaultheriæ.*Wintergreen Water.*

Although this water is not known to be official in any Pharmacopœia, yet it is used and prescribed by physicians quite generally. It may be made as follows :

Oil of Wintergreen,	30 minims.
Phosphate of Lime, precipitated, . . .	120 grains.
Distilled Water,	2 pints.

Rub the oil with the phosphate of lime, add the water and filter.

It may be made by distillation as follows :

Wintergreen, fresh herb,	20 ounces av.
Water,	2 gallons.

Distill 8 pints.

Or by mixing 1 fl.drachm Oil of Wintergreen with 4 ounces of sand and 1 gallon of water, and distilling 4 pints.

224. Aqua Lauro Cerasi, Br.*Cherry Laurel Water.*

Fresh Leaves of Cherry Laurel,	1 pound av.
Water,	3½ pints.

Crush the leaves and macerate with water in a warm place for 24 hours, then distill 20 ounces.

The Cherry Laurel is seldom found in this country, and it has been demonstrated, by the late Prof. Proctor, that the leaves of our ordinary wild cherry treated in the same way will produce an identical preparation. It is, therefore, advised to use them in making "Cherry Laurel Water" in this country.

Cherry Laurel Water may also be made by adding 15 drops Oil of Cherry Laurel to 2 pints of distilled water, and agitating until dissolved.

It is very similar to bitter almond water, which may be used for it.

225. Aqua Menthæ Piperitæ.*Peppermint Water.*

Oil of Peppermint,	30 minims.
Carbonate of Magnesium or Cotton, . .	60 grains.
Distilled Water,	2 pints.

Rub the oil with the magnesium or pick with the cotton; add water, and filter or percolate as directed, (210 *a* or *b*.)

The British Pharmacopœia directs this to be made by mixing $1\frac{1}{2}$ fl.drachms of Oil of Peppermint with 15 pounds of water, and distilling 10 pounds. The oil should be mixed with 4 ounces of sand as directed, (209 *b*.)

The German Pharmacopœia directs it to be made by mixing 1 part of cut Peppermint (herb) with water, and distilling 10 parts.

Peppermint Water is very much used and prescribed in medicine as a vehicle for other medicines, especially in flatulence and other dyspeptic troubles.

226. Aqua Mentha Viridis.*Spearmint Water.*

Oil of Spearmint,	30 minims.
Carbonate of Magnesium or Cotton, . .	60 grains.
Distilled Water,	2 pints.

Make in the same manner as is directed for peppermint water, (225.) Its uses are similar.

227. Aqua Picis, P. G.*Tar Water.*

Tar,	1 part.
Pumice-stone, in fine powder,	3 parts.

The pumice-stone should be washed and dried and mixed with the tar.

Then to make Tar Water:

Take of the above mixture,	4 parts.
Water,	10 parts.

Shake together for 5 minutes, and filter. It should be freshly made when desired for use. Tar Water was official in the 1870 U. S. P. under the title *Infusum Picis Liquidæ*.

Tar Water, as a domestic remedy, is a well-known preparation. It is made by putting a pint of Tar in a gallon or more of water and stirring occasionally.

228. Aqua Pimentæ, Br.

Pimento Water.

Pimento, bruised,	14 ounces av.
Water,	20 pounds av.

Distill 10 pounds.

This may also be prepared by adding 30 minims Oil of Pimento to 60 grains of cotton; picking, packing and percolating with 2 pints of distilled water.

It is not as good prepared with Carb. Magnesium, as the oil has an acid reaction.

229. Aqua Rosæ.

Rose Water.

Recent Pale Rose (petals),	2 parts.
Water,	10 parts.
Distill by means of steam,	5 parts.

The same proportions may be used, and the distillation performed by the ordinary still.

The British Pharmacopœia directs 10 pounds of fresh hundred-leaved rose petals to be mixed with 50 pounds of water, and 10 pounds distilled.

The German Pharmacopœia directs 4 drops of Oil of Rose to be shaken with 1,000 grammes (about 2 pints) of tepid water for some time, and then filtered.

Rose Water, to be fine, should be redistilled. It cannot be profitably distilled in this country, as our roses lack the fragrance of the European varieties.

Triple Rose Water may be bought of the importing druggists, and reduced with one or two parts of distilled water. It is then much better and cheaper than any of domestic production.

A fair quality of Rose Water may be made by adding 10 drops of Otto (Oil) of Rose to 30 grains of cotton, picking, packing and percolating with 2 pints of hot distilled water.

It may also be made by mixing 20 minims of Otto of Rose with 4 ounces of sand and one gallon of water, and distilling 4 pints.

The imported Rose Water is, however, superior to any home production.

Rose Water is used in several official preparations, and is much prescribed as a solvent for various substances used as lotions, etc.; it is also a favorite article for the toilet, either alone or mixed with other substances.

230. Aqua Sambuci, Br.

Elder Flower Water.

Fresh Elder Flowers, 10 pounds av.

Water, 50 pounds.

Distill 10 pounds.

This is used as a pleasant flavored water for medicinal lotions, etc.

Other Medicinal Waters.

Besides the foregoing waters, which are mostly official in either the United States, British, or German Pharmacopœias, others are frequently required, but they are all made in the same general manner as those herein given. Of those made from fruit or seeds, angelica, coriander, juniper, parsley, etc., may be made in the same manner as dill or fennel water; of those made from flowers or herbs, balm, borage, chamomile, hyssop, lavender, lettuce, lily, melilot, myrtle, organum, peach, pennyroyal, rosemary, sage, thyme, violet, wormwood, etc., may be made in the same manner as cherry laurel or elder flower water; of those made from barks, and other substances, lemon, orange, lime, sassafras, valerian, vanilla, and others, may be made by distillation in the same manner as is directed for making cinnamon water.

ARGENTUM — SILVER.

Symbol, Ag. Atomic weight 108. Sp. gr. (fused) 10.4.

Silver is a well-known elementary metal extensively used in the arts and employed as the money currency of many countries. It is obtained mostly from its ores, from which it is separated by various means, but is sometimes found in small quantities, as metallic silver. Its uses in the arts and commerce of the world are too well-known and general to require mention.

In pharmacy it is used in the metallic state only in the form of silver leaf (*Argentum Foliatum*) for coating pills, cachous, etc.; but its salts—particularly the nitrate of silver—are much employed for making various preparations, and are somewhat used in medicine.

Solutions of its salts are precipitated by chlorine compounds forming a curdy white precipitate, insoluble in nitric acid but soluble in water of ammonia. This forms a very delicate and characteristic test for silver.

The following are the U. S. official preparations of silver:

231. Argentum Purificatum.

Refined Silver.

The British Pharmacopœia, 1885, under this heading describes pure metallic Silver. It may be made by dissolving Coin Silver in nitric acid and water, adding hydrochloric acid, which precipitates chloride of silver, leaving the copper alloy in solution; the liquid is poured off, the precipitate washed and melted, with carbonate of sodium, in a crucible. The melted metal is then poured off and consists of pure silver.

232. Argenti Cyanidum.

Cyanide of Silver.

AgCN.

This salt is made by generating hydrocyanic gas in a retort by adding sulphuric acid to a solution of ferrocyanide of potassium, distilling and conducting the vapor into a glass

receiver containing a solution of Nitrate of Silver, from which Cyanide of Silver is precipitated.

It is used in pharmacy for the extemporaneous preparation of diluted hydrocyanic acid, which see, page 61.

233. Argenti Iodidum.

Iodide of Silver.

AgI.

This may be made by precipitating a solution of Nitrate of Silver with a solution of iodide of potassium.

It is sometimes given in doses of $\frac{1}{2}$ to 2 grains for syphilis.

234. Argenti Nitras.

Nitrate of Silver.

AgNO₃.

Nitrate of Silver is the working base of all the silver salts, and is the only silver salt that is employed to any extent in pharmacy or medicine. It is also extensively employed in photography.

A process for making it was formerly official but has been omitted in the 1880 United States Pharmacopœia.

The British Pharmacopœia, 1885, directs it to be made as follows:

Refined Silver (231),	3 ounces av.
Nitric Acid,	2½ fl.ounces.
Distilled Water,	5 ounces av.

Add the nitric acid and the water to the Silver in a flask, and apply a gentle heat till the metal is dissolved. Decant the clear liquid from any black powder which may be present, into a porcelain dish, evaporate and set aside to crystallize; pour off the liquor and again evaporate and crystallize. The crystals may be drained in a glass funnel.

Uses.—Crystallized Nitrate of Silver is used for making all the other Salts of Silver, and is largely employed in photography, silver-plating and other arts and industries. In pharmacy it is used for making hair dye, indelible ink, test

solutions, etc., and in medicine is used in solution to remove morbid growths, and as a caustic and escharotic, and internally in gastritis, diarrhoea, and other derangements of the digestive tract, in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain usually in the form of pills.

235. Argenti Nitras Dilutus.

Diluted Nitrate of Silver, U. S.—Nitrate of Silver and Potassium, Br., G. P.

The United States Pharmacopœia directs

Nitrate of Silver, 1 ounce.

Nitrate of Potassium, 1 ounce.

To be fused together in a porcelain capsule at as low a temperature as possible, thoroughly mixed and cast into suitable moulds.

The British and German Pharmacopœias direct

Nitrate of Silver, 1 ounce.

Nitrate of Potassium, 2 ounces.

To be fused together in the same manner; therefore, the United States preparation is one-half and the British and German preparations one-third Nitrate of Silver. This was formerly called *Argenti Nitras Mitigatus* or Mitigated Nitrate of Silver. It is cast in the form of cylindrical sticks and also in the form of small cones.

Uses.—This is now much used as a caustic and escharotic for external and internal application, as it is milder and just as efficient as the pure lunar caustic.

236. Argenti Nitras Fusus.

Moulded Nitrate of Silver.—Fused Nitrate of Silver.—Lapis Infernalis.—Lunar Caustic.

This is simply crystallized Nitrate of Silver, fused and cast into sticks or points for convenient use.

The United States Pharmacopœia directs it to be made as follows:

Nitrate of Silver, 1 ounce av.

Hydrochloric Acid, 16 minims.

Melt the Nitrate of Silver in a porcelain capsule at as low a heat as possible, and add to it gradually the hydrochloric acid, stir well, and when nitrous vapors cease to be evolved pour into suitable moulds. The object of adding the hydrochloric acid is to toughen the moulded sticks, as the fused nitrate alone is very brittle.

The British Pharmacopœia suggests, "To form *Toughened Nitrate of Silver* or *Toughened Caustic* add 5 parts of nitrate of Potassium to 95 parts of the Nitrate of Silver before fusion."

Uses.—This is used as an escharotic, but is not so much employed as formerly, the diluted Nitrate of Silver being used instead. It is a favorite popular application for warts and other excrescences.

237.

Argenti Oxidum.

Oxide of Silver.



The present United States Pharmacopœia does not give a process for making this salt.

The 1885 British Pharmacopœia directs as follows:

Nitrate of Silver, in crystals, . . .	½ ounce av.
Solution of Lime (Lime Water), . .	67 fl.ounces.
Distilled Water,	10 fl.ounces.

Dissolve the Nitrate of Silver in 4 ounces of the distilled water, and having poured the solution into a bottle containing the solution of lime, shake the mixture well and set it aside to allow the deposit to settle. Draw off the liquid, collect the precipitate on a filter, wash with the remainder of the distilled water, and dry at a moderate temperature.

Uses.—The Oxide of Silver is somewhat used as a substitute for Nitrate of Silver, being much less caustic, and, therefore, better suited for internal administration. It may be made into pills or mixed with other powders and given in capsules. Care must be taken in dispensing this salt not to

triturate it with readily oxidizable substances nor ammonia, as it forms explosive compounds.

The photographic art and the use of indelible ink and hair dyes depend upon the conversion of the Nitrate of Silver into Oxide of Silver, which is insoluble.

Other Salts of Silver.

The foregoing official Salts of Silver are all that are used to any extent in pharmacy or medicine. The following are, however, sometimes required :

238. Acetate of Silver— $\text{AgC}_2\text{H}_3\text{O}_2$.—Made by decomposing a solution of Nitrate of Silver by adding it to a solution of acetate of sodium, collecting the precipitate, washing and drying.

239. Bromide of Silver— AgBr .—By decomposing a solution of Nitrate of Silver, by adding it to a solution of bromide of potassium, collecting the precipitate, washing and drying.

240. Chloride of Silver— AgCl .—By adding to a solution of Nitrate of Silver hydrochloric acid or common salt as long as a precipitate is formed, then collecting, washing and drying the precipitate. This is freely obtained by precipitating the washings of photograph plates with common salt.

241. Chromate of Silver— Ag_2CrO_4 .—By adding a neutral solution of chromate of potassium to a solution of Nitrate of Silver, collecting, washing and drying the precipitate.

242. Oxalate of Silver— $\text{Ag}_2\text{C}_2\text{O}_4$.—By adding a solution of oxalic acid to a solution of Nitrate of Silver, collecting, washing, and drying the precipitate.

243. Phosphate of Silver— Ag_3PO_4 .—By decomposing a solution of Nitrate of Silver by adding to it a solution of phosphate of sodium, collecting the precipitate, washing, and drying.

244. Sulphate of Silver— Ag_2SO_4 .—By decomposing a solution of Nitrate of Silver by adding to it a solution of sulphate of sodium, collecting the precipitate, washing and drying.

Many other Salts of Silver exist in nature in the form of ores, as *Sulphide of Silver*, *Carbonate of Silver*, etc., or may be made in the laboratory by combining it with various acids, but those already mentioned are all that are of interest to pharmacy.

ARSENICUM — ARSENIC.

Symbol, As; Atomic weight, 75; Sp. gr. 5.73 to 5.88.

Arsenicum, more commonly called Arsenic, is a brittle, gray-colored metallic element very much resembling antimony in its general appearance and characteristics. It is found in nature as a free metal, but much more abundantly in ores, or combined with other metals as an alloy, or in the form of salts, its sulphides being most common. With oxygen it forms Arsenious Oxide As_2O , and Arsenic Oxide As_2O_3 . With sulphur it forms a disulphide known as *realgar* or *ruby sulphur*, As_2S_2 ; a trisulphide known as *orpiment* or yellow sulphide, As_2S_3 ; and a pentasulphide, As_2S_5 . With hydrogen and oxygen it forms true Arsenious Acid, H_3AsO_3 , and Arsenic Acid, H_3AsO_4 ; the former combines with some bases to form salts known as *Arsenites*, and the latter forms *Arseniates*.

The oxides and sulphides of Arsenic are considerably used in the arts, and somewhat, though not so much as formerly, employed in pharmacy and medicine.

The following Arsenical compounds are official in the United States:

245. Acidum Arseniosum.

Arsenic—Arsenious Acid or Oxide—White Arsenic—Arsenious Anhydride—Ratsbane.



This is the common Arsenic of commerce. It is prepared by roasting Arsenical ores in suitable furnaces, collecting the vapor and resubliming. As will be noticed by its formula it is not a true acid, but an anhydride or oxide.

Uses.—In pharmacy, Arsenic is extensively put up and sold as a rat poison, and its solution with alkalis is used to saturate paper sold as fly-paper; it is also used for making most of the medicinal preparations of Arsenic. In medicine it is employed as an alterative in doses of $\frac{1}{32}$ to $\frac{1}{20}$ grain, and used with

other substances as a caustic application to cancers and fungus growths.

Antidote.—The most effectual antidote to arsenical poisoning is freshly prepared ferric hydrate, with which it forms insoluble ferrous arseniate.

246. Arsenii Iodidum.

Iodide of Arsenic, U. S.—Iodide of Arsenicum, Br.

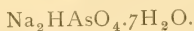


This compound is made by directly combining 1 part of Metallic Arsenic in fine powder with 5 parts of Iodine, then warming the mixture in a flask until liquefied, and pouring upon a marble slab to cool.

Uses.—Iodide of Arsenic is chiefly used in pharmacy for preparing Donovan's solution; in medicine it is given as an alterative in doses of $\frac{1}{16}$ grain, and sometimes used in ointments.

247. Sodii Arsenias.

Arseniate of Sodium.



The following process for making this salt was formerly official:

Arsenious Acid, in fine powder,	960 grains.
Sodium Nitrate, in fine powder,	816 grains.
Sodium Carbonate, dried, and in fine powder,	528 grains.
Distilled Water, boiling hot,	8 fl.ounces.

Having mixed the powders thoroughly put the mixture into a large clay crucible and cover it with the lid. Expose it to a full red heat until effervescence has ceased and complete fusion has taken place. Pour the fused salt on a porcelain slab and as soon as it has solidified, and while still warm, put it into the boiling water and stir until it is dissolved. Filter the solution and set it aside to crystallize, etc.

Uses.—The properties of this salt are the same as arsenious acid; the dose is from $\frac{1}{2}$ to $\frac{1}{3}$ of a grain.

Other Salts of Arsenic.

The foregoing are the Salts of Arsenic mainly used in pharmacy and medicine, but the following are sometimes employed :

248. Bisulphide of Arsenic or Realgar— As_2S_2 .—Made by fusing together 5 parts of Arsenious Acid and 3 parts of sulphur.

249. Bromide of Arsenic— AsBr_3 .—By dusting Arsenic in powder in a retort filled with bromine vapor, and distilling.

250. Chloride of Arsenic— AsCl_3 .—By acting upon metallic Arsenic with chlorine gas.

251. Trisulphide of Arsenic or Orpiment.— As_2S_3 .—By fusing 5 parts of Arsenious Acid with 5 parts of sulphur.

AURUM—GOLD.

Symbol, Au ; Atomic weight, 196 ; Sp. gr. average 19.3.

Gold is the most valuable of the metallic elements. It is used as the standard money bases of all countries, and on account of its value, malleability, ductility, and permanence of color is extensively used for ornamentation and for making useful and valuable articles. It is obtained mainly as a free metal or alloyed with other metals.

Metallic Gold is used in pharmacy only in the form of gold leaf, for coating pills, cachous, etc. The only Salt of Gold which is used to any extent in pharmacy or medicine is the Chloride of Gold and sodium, which is official in the United States and German Pharmacopœias.

252. Auri et Sodii Chloridum.

Chloride of Gold and Sodium.

A mixture composed of equal parts of dry Chloride of Gold (AuCl_2) and chloride of sodium (NaCl).—*U. S.*

The German Pharmacopœia directs 65 parts of pure Gold to be dissolved by gentle heat in a mixture of 65 parts of nitric acid and 240 parts of hydrochloric acid ; the solution is then

to be diluted with 200 parts of water and 100 parts of pure dry chloride of sodium dissolved in the mixture, which is then to be evaporated to dryness by means of a water-bath, with constant stirring.

Uses.—This salt is considerably used in photography for “toning” prints, and for electroplating. In medicine it is given as an alterative in doses of $\frac{1}{12}$ to $\frac{1}{4}$ grain.

Other Salts of Gold.

The following Salts of Gold are sometimes directed or employed in pharmacy and medicine.

253. Bromide of Gold— AuBr_3 .—Made by dissolving gold in a mixture of nitric and hydrobromic acids, concentrating and crystallizing.

254. Chloride of Gold— AuCl_3 .—By dissolving Gold 1 part in nitro-hydrochloric acid 8 parts, concentrating and crystallizing. This salt is a *Trichloride of Gold*. It is used in photography, etc., the official Chloride of Gold and sodium is made by mixing equal parts of this with dry chloride of sodium. *Monochloride of Gold*— AuCl —may be made by heating the trichloride to about 440°F . until fumes of chlorine cease to be evolved.

255. Cyanide of Gold— AuCy_3 .—By adding a solution of Cyanide of potassium to a solution of Chloride of Gold as long as a precipitate is formed, washing and drying the precipitate.

256. Iodide of Gold— AuI_3 .—By gradually adding a solution of Chloride of Gold to a solution of iodide of potassium, and drying the precipitate. Used as an alterative; dose about $\frac{1}{16}$ grain.

257. Oxides of Gold.—Gold forms with alkaline bases a *monoxide* Au_2O , and a *trioxide* Au_2O_3 . Sometimes it is given as an alterative in doses of $\frac{1}{12}$ to $\frac{1}{2}$ grain.

258. Sulphide of Gold— Au_2S_3 .—By passing a current of sulphuretted hydrogen through a solution of Chloride of Gold in water, collecting and washing the precipitate.

BALSAMA — BALSAMS.

Balsams or Balms (Fr. Baumes), as they are known in pharmacy, embrace a variety of natural and prepared substances supposed to possess healing or soothing virtues. As popularly known, they include not only the natural Balsams obtained from balsam-bearing trees, but a variety of preparations rang-

ing in consistence from tinctures to ointments, which have derived the name of "Balsam" from properties claimed for them by their originators. In this article we shall include only the Balsams proper, and those prepared, which have by long usage become most familiar as "Balsams," in a pharmaceutical sense. Other Balsams will be found under other headings, where they more properly belong, as *Friar's Balsam* (see Compound Tincture of Benzoin), *Turlington's Balsam* (see Proprietary Medicines), *Cough Balsam* (see Standard Remedies), etc.

In French Pharmacy a great number of preparations are classed with Balsams which properly belong elsewhere.

True Natural Balsams.

The True Natural Balsams may be defined as oleo-resinous substances, either semi-liquid, or semi-solid, or solid, obtained from plants, and containing benzoic, cinnamic, or some analogous acids.

Only seven substances are thus classed, and some of these are not known commercially as Balsams. They are as follows:

259. Balsam of Calaba — *Tacamahaca*.—This is obtained from the trunk, branches and leaves of *Calophyllum Calaba*, or Santa Maria tree. It is a liquid, at first white, but soon becomes olive-green, and is sometimes called Green Balsam. A similar Balsam is obtained from *chloroxylon verticillatum* of Peru, which is popularly called *Green Balsam* (of Peru). They contain benzoic acid.

260. Balsam of Peru.—A liquid balsam, obtained from *Myroxylon Pereira*, containing cinnamic and benzoic acids, and some other allied compounds. A solid or semi-solid variety is also imported, but not frequently kept by druggists.

Uses.—Balsam of Peru is used as a stimulant to the mucous membrane, and in stimulating ointments, etc. Also as a preservative for fats.

As found in the market, it is frequently adulterated with or entirely fabricated from other substances.

261. Balsam of Tolu.—A Balsam obtained from *Myroxylon Toluifera*, containing cinnamic and benzoic acids, volatile oils, called *benzyl benzoate*, $C_7H_5(C_7H_7)O_2$, and *benzyl cinnamate*, $C_9H_7(C_7H_7)O_2$, a terpene named Tolene, $C_{10}H_{16}$, and resins. It is a semi-liquid, as first obtained from the trees, but concretes into a solid resinous mass by standing.

Uses.—It is much used in cough remedies as an agreeable aromatic, and in the form of tincture and syrup is frequently prescribed.

262. Benzoin, or Benjamin.—A solid Balsamic resin, obtained from *Styrax Benzoin*, containing benzoic acid, cinnamic acid, a fragrant volatile oil and resins. Vanillin is also found in some varieties.

Uses.—In pharmacy it is used as a preservative for fats and in making several preparations, and in medicine as an aromatic stimulant and expectorant. The dose is 10 to 15 grains.

Benzoyl— C_7H_5O .—This is the radical of an extensive series of aromatic compounds which are derived directly or indirectly from Benzoin.

Benzoic Acid, $HC_7H_5O_2$, is obtained from benzoin and other balsams by sublimation, but is now mostly made artificially from coal-tar hydro-carbons. It forms with bases a class of salts called *Benzoates*, now considerably used in kidney diseases. It is stimulant, expectorant and antiseptic; the usual dose being from 5 to 10 grains in mucilage or syrup.

263. China Varnish Balsam.—An aromatic, varnish-like exudation, obtained from *Augia Sinensis*, containing benzoic acid and other similar compounds. It is used by the Chinese for preparing the varnish or lacquer so celebrated in that country.

264. Styrax or Storax.—A Balsam prepared from the inner bark of *Liquidambar Orientalis*, containing cinnamic and benzoic acids, *Styracin*, $C_9H_7(C_8H_9)O_2$, *Storecin* $C_{36}H_{58}O_3$, *Ethyl Cinnamate* $C_9H_7(C_2H_5)O_2$, *Phenyl-propyl Cinnamate* $C_9H_7(C_9H_{17})O_2$, *Styrol* C_8H_8 , resins, etc.

It is a semi-liquid grayish-green Balsam, used in pharmacy in making compound tincture of benzoin, and as a preservative for fats, etc. Also used in perfumery.

265. Liquidambar, or Sweet Gum.—A balsamic exudation from *Liquidambar Styraciflua*. The constituents and properties of this Balsam seem to be identical with Storax, but it differs from it in being, as found in the market, a resinous gum instead of a liquid.

Other Natural “Balsams.”

The following natural exudates are commercially known as Balsams, but pharmaceutically are classed with oleo-resins, turpentine, resins, etc., under which headings they will be more fully noticed.

Balsam Copaiba, Copaiba Balsam or Copaiba.

Balsam of Fir, Canada Balsam or Canada Turpentine.

Gurjun Balsam, or Wood Oil.

Hungarian Balsam.

Japan Varnish Balsam or Japan Lacquer,

Balsam of Mecca or Balm of Gilead.

Balsam Rackasira.

Balsam of Riga or Carpathina Balsam.

Turpentine Balsam, Turpentine Gum, or Gum Thus.

Factitious Balsams.

It is customary with dealers, for some purposes, to supply imitations of several of the more expensive Balsams. The practice is not to be commended, but the formulæ for these fabrications may be interesting to our readers.

266. Factitious Canada Balsam.

White Resin,	4 pounds av.
Oil of Turpentine,	1 gallon.
Linseed Oil,	8 fl.ounces.
Oil of Lemon,	30 minims.
Oil of Rosemary,	20 minims.

Dissolve the resin in the oil of turpentine and add the other oils.

267. Factitious Balsam Copaiba.

Benzoin, powdered,	4 ounces av.
White Resin,	3 pounds av.
Canada Balsam,	2 pounds av.
Castor Oil,	1 gallon.
Oil of Juniper,	2 fl.ounces.
Oil of Savin,	1 fl.ounce.
Oil of Orange,	30 minims.
Oil of Lemon,	30 minims.

Melt the resin, add the benzoin and part of the Castor Oil, and mix well together; then add the remainder of the Castor Oil and the Canada Balsam, and when nearly cool the remaining oils. Let settle and strain.

Diluted or Reduced Balsam Copaiba.—Balsam Copaiba is often sold diluted with Castor Oil or Canada Balsam, or other similar substances. Such practice should be discountenanced, but the diluted article is, perhaps, better than the factitious.

268. Factitious Balsam of Mecca or Balm of Gilead.

The true Mecca Balsam or Balm of Gilead is an oleo-resin, obtained from the Balm-of-Gilead tree of the East, but the factitious Balsam is much more frequently sold and used. It may be made as follows:

Benzoin, coarsely powdered,	4 ounces.
Liquid Storax,	3 ounces.
Balsam Tolu,	2 ounces.
Canada Balsam,	30 ounces.

Mix together in a closed vessel and heat by water-bath with frequent agitation until the substances are well incorporated. When cold pour off the clear

portion from the sediment and add 10 minims each oils of Lemon, Cassia, Nutmeg, Rosemary and Vanilla.

269. Factitious Balsam of Peru.

Benzoin, in coarse powder,	12 ounces.
Balsam Tolu,	4 ounces.
Liquid Storax,	$\frac{1}{2}$ ounce.
Alcohol, a sufficient quantity.	

Mix the Balsams with 2 pints of Alcohol and macerate by the heat of a water-bath until the Balsams are dissolved as much as possible; strain the liquid while hot, and add sufficient Alcohol to the strained liquid to make 2 pints.

Diluted or Reduced Balsam of Peru.—This may be made by taking Balsam of Peru 3 parts. Balsam of Tolu 2 parts, and Alcohol enough to make a liquid of the proper consistence (about $2\frac{1}{2}$ parts).

270. Factitious Balsam of Tolu.

Balsam of Tolu is frequently adulterated with resin or other similar substance, but is seldom made up entirely from foreign substances. An old formula for making Factitious Balsam of Tolu is as follows:

Orange Shellac and White Sugar equal parts, Alcohol sufficient to soften the Shellac, Tincture of Benzoin, Oil of Cassia, Oil of Nutmeg, and Tincture of Vanilla sufficient to flavor; warm and work them well together.

Balsamic Compounds.

The following compounds are those which may properly be classed as Balsamic compounds pharmaceutically. They do not include the ointments that are popularly known as "Balsams," nor the proprietary preparations called "Balsams," nor such tinctures or other preparations known as "Balsams," that more properly come under other headings.

271. Balsam of Honey.

(*Pectoral Balsam.*)

Balsam of Tolu,	1 ounce av.
Honey, strained,	$2\frac{1}{2}$ ounces av.
Opium, in powder,	60 grains.
Turmeric, in powder,	30 grains.
Alcohol,	9 fl.ounces.
Water,	1 fl.ounce.

Mix, macerate for one week and filter. Used for coughs, hoarseness, etc. Dose, 20 to 40 drops.

272. Balsam of Guaiacum.

Guaiac Resin,	8 ounces av.
Balsam of Peru,	90 minims.
Alcohol,	9 fl.ounces.
Water,	1 fl.ounce.

Mix, macerate for one week and strain. An old remedy for rheumatism, ague, etc. Dose, 20 to 60 drops.

273. Green Balsam.

(*Balsam Viride.*)

Besides the natural Green Balsams previously mentioned, the following is sometimes used:

Linseed Oil,	12 ounces av.
Gum Elemi,	2 ounces av.
Verdigris, in powder,	3 drachms.

Heat the Oil and the Gum together, add the Verdigris, and after standing a few days pour off the liquid. Used externally as a stimulating application to indolent sores.

274. Goulard's Balsam.

Balsam Saturnine.

Acetate of Lead, dry, in powder,	2 ounces av.
Oil of Turpentine,	1 pint.

Heat the Oil, and triturate the powder with it in a hot mortar until cool, then pour off the clear portion. Used externally for sores, ulcers, etc.

275. Balsam of Metz.

Aloes, in fine powder,	120	grains.
Verdigris, "	180	grains.
Sulphate of Zinc, "	90	grains.
Turpentine (Gum Thus),	2	tr.ounces.
Oil of Juniper,	4	fl.ounces.
Oil of Cloves,	1	fl.drachm.
Oil of Laurel Berries,	1	fl.ounce.
Olive Oil,	4½	fl.ounces.
Linseed Oil,	4½	fl.ounces.

Melt the Turpentine, add the oils, except the Juniper and Cloves, stir in the powder, put in a bottle, and when cool add the oil previously omitted, and shake well. This is used as a dressing for ulcers, sores, etc.

276. Balsam of Sulphur.

(*Sulphurated Oil.*)

This preparation is known pharmaceutically as *Sulphuratum Oleum* or Sulphurated Oil, but is more commonly known and called for as Balsam of Sulphur. It is made as follows:

Sulphur, sublimed,	3½ ounces.
Linseed Oil,	21 ounces.

Put the Oil in a capacious iron kettle, add the Sulphur, and boil gently, with continual stirring, until the Sulphur is entirely dissolved and a uniform liquid is obtained.

This is used externally, and, in combination with other substances, is often prescribed for internal use.

277. Balsam of Turpentine.

Common Resin,	1 pound av.
Oil of Turpentine,	1 pint.

Melt the Resin, remove from the fire, and while cooling add the Oil of Turpentine. This is sometimes sold as Peckham's Balsam (see Proprietary Medicines).

278. Universal Balsam or Balm.

Benzoin, in powder,	6 ounces.
Balsam of Tolu,	3 ounces.
Storax,	2 ounces.
Olibanum (Frankincense),	2 ounces.
Myrrh, in powder,	2 ounces.
Socotrine Aloes, in powder,	3 ounces.
Alcohol,	1 gallon.

Mix them well together, and keep in a warm place for several weeks, or heat gently in a closed vessel by a water-bath until the gums are dissolved, then strain or filter.

This is given internally in doses of 20 to 40 drops on sugar,

or is used externally for cuts or wounds. It is similar to compound Tincture of Benzoin.

BARIUM.

Symbol, Ba; Atomic weight, 137; Sp. gr., 4.70.

Barium is a metallic element closely related to calcium and magnesium. It is not found uncombined in nature but may be obtained from its oxide *baryta* by heating it in an iron tube through which the vapor of potassium is conveyed. The reduced Barium is then extracted from the mixed residuum in the tube by treating with mercury, and the mercury is afterward driven off by distillation in a vapor of mineral naphtha.

The metal was first isolated by Sir H. Davy, in 1808. It is of a greenish silver-white lustre, malleable, decomposes water and gradually oxidizes in the air, forming *baryta* or *barytes*, BaO.

Salts of Barium.

No Salts of Barium are official, but the chloride and nitrate are used for making test solutions. In the industrial arts several of the Salts of Barium are extensively employed. Salts are formed with nearly all the acids, and negative elements. The following are the most important:

279. Barium Acetate— $\text{Ba}(\text{C}_2\text{H}_3\text{O}_2)_2$.—Made by neutralizing acetic acid with carbonate of barium evaporating and crystallizing.

280. Barium Arseniate— $\text{Ba}_3(\text{AsO}_2)_2$.—By precipitating a solution of arseniate of potassium with a solution of Chloride of Barium. Given in skin diseases, in doses of $\frac{1}{16}$ to $\frac{1}{4}$ grain.

281. Barium Benzoate— $\text{Ba}(\text{C}_7\text{H}_5\text{O}_2)_2 + 2\text{H}_2\text{O}$.—By neutralizing a solution of benzoic acid with Carbonate of Barium, evaporating and crystallizing.

282. Barium Bromide— $\text{BaBr}_2 \cdot 2\text{H}_2\text{O}$.—By saturating a solution of caustic baryta with hydrobromic acid, evaporating and crystallizing.

283. Barium Carbonate— BaCO_3 .—This is found abundantly in Nature, the native carbonate being called *Witherite*. This is sufficiently pure for industrial and commercial purposes. It is used as the manufacturing basis of most of the Barium Salts. It is very poisonous. May be employed as a rat poison or for other similar purposes. It is also used in

face powders and liquid cosmetics, and is considerably used in place of carbonate of lead to adulterate paint.

284. Barium Chloride— $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$.—By dissolving Carbonate of Barium in hydrochloric acid, evaporating and crystallizing. Used for making test solution (see solutions), and in medicine as an alternative, in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain, also externally in solution.

285. Barium Chromate— BaCrO_4 .—By adding baryta water (solution of Caustic Barium) to a solution of chromate of potassium, washing and drying the precipitate.

286. Barium Hydrate— $\text{Ba}(\text{HO})_2$.—By digesting caustic baryta (Barium Oxide) with a little water, the elements of water are assimilated, yielding Hydrate of Barium, or it may be crystallized from baryta water by evaporation. *Baryta Water* is made by dissolving the hydrate thus formed in water to saturation.

287. Barium Iodide— Ba_2I .—By adding iodine gradually, in excess, to a solution of Sulphate of Barium. When the reaction is finished filter the solution, evaporate and crystallize.

288. Barium Nitrate— $\text{Ba}(\text{NO}_3)_2$.—By decomposing a solution of nitrate of sodium with a solution of Chloride of Barium, collecting the precipitate, washing and drying. This is used for making a test solution. (See solutions.)

289. Barium Oxalate— BaC_2O_4 .—By precipitating a solution of Oxide of Barium with a solution of oxalic acid, collecting, washing, and drying.

290. Barium Oxide—*Baryta, Barytes, Caustic Baryta*— BaO .—This is a very caustic, corrosive, alkaline substance, which may be made by calcining some of the Salts of Barium, or decomposing Solution of Sulphide of Barium by oxide of zinc. *Peroxide of Barium* BaO_2 is prepared by passing a stream of oxygen or air through a tube, containing baryta heated to dull redness. By treating with diluted hydrochloric acid it yields solution of *peroxide of hydrogen* (H_2O_2).

291. Barium Sulphate— BaSO_4 .—This is found native or may be prepared by decomposing a solution of Chloride of Barium with sulphuric acid, collecting the precipitate, washing, and drying.

Sulphide of Barium— BaS —and *Sulphite of Barium* BaSO_3 , are other compounds of sulphur and oxygen with Barium sometimes used.

Some of the Barium Salts are used in combination with chlorides for making colored fires of a greenish color, or giving a greenish color to flame.

Antidotes.—For poisoning by soluble Salts of Barium any of the soluble sulphates in solution may be given, as Epsom or Glauber's salt, alum, etc. They form insoluble Sulphate of Barium.

292. BENZINUM — BENZIN, U. S.

Petroleum Benzin, Petroleum Ether.

"A purified distillate from American Petroleum, consisting of hydrocarbons, chiefly of the marsh-gas series (C_5H_{12} ; C_6H_{14} and homologous compounds), having a sp. gr. from 0.670 to 0.675, and boiling at 50° to 60° C. (122° to 140° F.)" It is soluble in 6 parts of Alcohol.

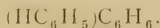
The preparation thus described in the U. S. P. is obtained by fractional distillation from Petroleum, and is known in the market as "*Naphtha*." It is intermediate between gasoline and benzine, and consists mainly of the hydrocarbons *pentane* and *hexane*. Gasoline, which is of less sp. gr., is frequently used in place of it for pharmaceutical purposes. It is quite different from the *benzene* obtained from coal-tar, which is more commonly known as *benzol*.

It is a powerful solvent of fixed oils, resins, caoutchouc, paraffin, etc., and is used in pharmacy for extracting oleoresins, for removing fixed oils from certain drugs, previous to percolation, for purifying some solutions and for other purposes. Either alone or combined with other substances, it is used for removing grease spots, etc., from clothing.

Benzine.—The hydrocarbon distilled from petroleum, and known commercially as Benzine, is a heavier product than Benzin as above described. Its sp. gr. being from 0.725 to 0.737. It is the last of the series of hydrocarbons which distills before illuminating oil begins to be run.

It has a strong odor, and was formerly used considerably in place of turpentine for painting and similar purposes. It should not be confounded with Benzene, which is obtained from coal-tar.

BENZOLUM — BENZENE — BENZOL.

Hydride of Phenyl.

This is the first member or basis of the important homologous series of hydrocarbons known as the *Aromatic or Benzene*

Series (C_nH_{2n-6}). Its sp. gr. is 0.85 to 0.90, and it boils at $80^{\circ}4$ to 85° C. (177° to 185° F.). It is chiefly derived from coal-tar by distillation, but is also obtained from petroleum and other hydrocarbons, and from benzoic acid, from which it derives its name. It was first discovered by Faraday in 1825, in the products of the destructive distillation of whale oil, and afterward, by Mitscherlich, was obtained from benzoic acid, by distilling with hydrate of lime. In 1849, Mr. C. B. Mansfield discovered its presence in coal-tar naphtha, from which the commercial Benzol is now chiefly obtained; but recently its manufacture from petroleum has assumed considerable commercial importance.

In the arts the importance of Benzene cannot be overestimated. It is the commercial basis of aniline, of nitrobenzol, and of a great variety of products of chemistry and pharmacy which, at the present time, are attracting much attention. For further information on this subject, our readers are referred to FENNER'S PRACTICAL CHEMISTRY.

Benzene or Benzol should not be mistaken for Benzine, which is distilled from petroleum, as they are not identical in composition.

With other hydrocarbon bases Benzene forms a series of compounds classed as the Aromatic or Benzene Series, the more important of which are:

C_6H_6	Benzene ..	C_6H_6 .
C_7H_8	Toluene or Methylbenzene.....	$C_6H_5(CH_3)$.
C_8H_{10}	Xylene or Ethylbenzene (and other isomers)	$C_6H_5(C_2H_5)$.
C_9H_{12}	Propylbenzene (and other isomers)	$C_6H_5(C_3H_7)$.
$C_{10}H_{14}$	Isobutylbenzene (and other isomers).....	$C_6H_5 \cdot C_2H_3(CH_3)_2$.
$C_{11}H_{16}$	Isoamylbenzene (and other isomers).....	$C_6H_5 \cdot C_3H_5(CH_3)_2$.
etc.	etc., etc.	

The chief product of Benzene, in a commercial sense, is its nitrate or nitrobenzol.

293. Nitrobenzol— $C_6H_5NO_2$ —*Artificial Oil of Bitter Almonds* is made by adding Benzol in small portions to fuming nitric acid. A violent reaction occurs, and a dark-red liquid results. Water is added, and an oily liquid precipitates; the water is poured off and the oily precipitate repeatedly washed with fresh water. It is chiefly used for scenting soaps and for the manufacture of aniline. It should never be used for flavoring medicinal preparations.

BISMUTHUM — BISMUTH.

Symbol, Bi; Atomic Weight, 210 (Dumas); sp. gr. 9.82.

Bismuth is a metallic element, classed, on account of its analogies, with arsenic and antimony. It is found in nature in a metallic state and combined with other metals and ores. In appearance it closely resembles antimony. It is crystalline, brittle, pulverizable, and has a reddish silver color. It melts at 264°C . (507°F .) and is readily obtained from its ores by fusion. Upon solidifying after fusion it expands $\frac{1}{32}$ of its volume.

Bismuth is used in the arts chiefly as an alloy with other metals. In pharmacy it is used for the preparation of many of its salts, which are employed in medicine, and also as ingredients in toilet powders and liquid cosmetics.

The following are the chief alloys of Bismuth:

294. Fusible Metal.—With lead and tin Bismuth forms alloys known as *Fusible Metal*, which have a very low melting point, the temperature required to fuse them being less than of boiling water. *Newton's Fusible Metal* consists of Bismuth 8 parts, lead 5 parts, and tin 3 parts. It fuses at 94°C . (202°F .) *Darcet's Fusible Metal* consists of Bismuth 2 parts, lead 1 part, tin 1 part. It fuses at 93°C . (199°F .) Another combination of the three metals liquefies at a still lower temperature. When Cadmium is added the fusibility of these alloys is increased. *Wood's Fusible Metal*, which consists of 1 to 2 parts of cadmium, 2 of tin, 2 of lead, and 7 to 8 parts of Bismuth, melts between 66° and 71°C .; and another described by Lipowitz, consisting of 8 parts of lead, 15 of Bismuth, 4 of tin, and 3 of cadmium, softens at 55° and liquefies at 60°C .

These alloys are sometimes used as safety plugs for steam apparatus, but are chiefly valuable in experiments.

295. Soft Solder for Mending Pewter and other ware, melting at a low temperature, is made by melting together 1 part of Bismuth, 2 of tin and 1 of lead. This same composition is also used as a bath for tempering steel, and for making the moulds for cakes of fancy soap, etc.

296. Electrotpe Moulds.—An alloy for electrotpe moulds may be made with Bismuth 8 parts, lead 8 and tin 3. It melts at 228°F ., and is allowed to cool until it becomes pasty, when the warmed cut, medal or other device is pressed upon it and kept in contact until cool.

297. Bismuth Amalgam is formed by adding 2 parts of hot Mercury to 1 part of fused Bismuth.

Other alloys of Bismuth with silver, platinum, copper or other metals may be made, but they have no industrial application.

298. Bismuthum Purificatum, Br.

Purified Bismuth.

Commercial metallic Bismuth contains many impurities which render it unfit for use in making medicinal salts of Bismuth. The Br. P. therefore directs that it be purified as follows :

Bismuth,	10	ounces av.
Cyanide of Potassium,	$\frac{1}{2}$	ounce av.
Sulphur,	80	grains.
Carbonate of Potassium recently ignited, }		of each a
Carbonate of Sodium recently ignited, }		sufficiency.

“ Melt the Bismuth in a crucible, add the Cyanide of Potassium and Sulphur previously mixed. Heat the whole to low redness for about 15 minutes, constantly stirring. Remove the crucible from the fire, and let it cool until the flux has solidified to a crust. Pierce two holes in the crust and pour the still fluid bismuth into another crucible. Remelt this partially purified bismuth with about five per cent. of a mixture of equal parts of the dried carbonates of potassium and sodium, heating to bright redness and constantly stirring. Remove the crucible from the fire, cool and pour out the bismuth into suitable moulds.” *Br.* This process entirely frees it from arsenic and other impurities, and fits it for use in making medicinal salts.

Official Salts of Bismuth.

The following are the Salts of Bismuth which are official in the leading pharmacopœias. They are astringent and tonic, and are also used internally and externally to prevent irritation and cover irritated surfaces :

299. Bismuthi Carbonas, Br.

Carbonate of Bismuth—Oxycarbonate of Bismuth.



The 1885 Br. P. gives the following formula for the preparation of this salt, which differs from the U. S. *subcarbonate* of

Bismuth only in containing one volume less of CO_3 in its molecule:

Purified Bismuth in small pieces, . . .	2 ounces av.
Nitric Acid,	4 fl.ounces.
Carbonate of Ammonium,	6 ounces av.
Distilled water, a sufficiency.	

“Mix the Nitric Acid with three ounces of distilled water and add the bismuth in successive portions. When effervescence has ceased, apply for ten minutes a temperature approaching that of ebullition, and afterwards decant the solution from any insoluble matter that may be present. Evaporate the solution until it is reduced to two fl.ounces, and add this in small quantities at a time to a cold filtered solution of the carbonate of ammonium in two pints of distilled water, continually stirring during admixture,” collect the precipitate on a calico filter, wash with distilled water, press and dry at a temperature not exceeding 150°F . Dose, 5 to 20 grains.

300.

Bismuthi Citras.

Citrate of Bismuth.



The U. S. P. directs this to be made by boiling 10 parts of subnitrate of bismuth and 7 parts of citric acid with 40 parts of distilled water until a drop of the mixture yields a clear solution with water of ammonia, and then adding 500 parts of distilled water, allowing the suspended matter to deposit, washing the precipitate with distilled water, and drying at a gentle heat.

The Br. P. directs $5\frac{1}{2}$ ounces av. of subnitrate of Bismuth to be dissolved in 11 fl.ounces (or a sufficiency) of nitric acid by the aid of heat. Water is then added until the solution remains permanently slightly cloudy; 8 ounces av. of bicarbonate of sodium is then dissolved in distilled water, 4 ounces av. of citric acid is added, and the solution boiled until all the gas is expelled. This solution is then added to the solution of Bismuth, and the whole heated to boiling, with occasional

stirring. When cold the liquid is poured off and the precipitate washed and dried over a water-bath.

Uses.—This salt is seldom employed in medicine, but in pharmacy is used for preparing Citrate of Bismuth and Ammonium, U. S. P. and solution of Bismuth and Ammonium. *Br. P.*

301. Bismuthi et Ammonii Citras.

Citrate of Bismuth and Ammonium.

The U. S. P. directs this to be made by mixing 10 parts of Citrate of Bismuth with 20 parts of distilled water and gradually adding water of ammonia until the salt is dissolved and the liquid has only a faintly alkaline reaction. The solution is then to be filtered, evaporated to a syrupy consistence, and spread upon plates of glass, so that in drying the salt may be obtained in scales.

The *Br. P.* process is in effect the same, the official solution of Citrate of Bismuth and ammonium being evaporated, etc., as above. This is the only soluble Salt of Bismuth, and in pharmacy is considerably used in making elixirs and other preparations requiring Bismuth in solution. It is sometimes prescribed in powders, etc., the dose being from 1 to 3 grains.

302. Bismuthi Oxidum, Br.

Oxide of Bismuth.



Subnitrate of Bismuth,	1 ounce av.
Solution of Soda,	5 fl.ounces.

Mix and boil for five minutes, then, having allowed the mixture to cool and the oxide to subside, decant the supernatant liquid, wash the precipitate thoroughly with distilled water, and, finally, dry the oxide by the heat of a water-bath." This salt is also known by the names *Teroxide of Bismuth* and *Protoxide of Bismuth*, or *Bismuthous Oxide*.

Hydrated Oxide of Bismuth may be made by gradually dropping an acid solution of Bismuthous Nitrate into a concentrated solution of potassium hydrate (solution of potassa), entirely free from carbonic acid, and washing and drying the precipitate.

Bismuthic Oxide or Anhydride— Bi_2O_5 —(*Bismuthic Acid*) is prepared by suspending Bismuthous Oxide in a strong solution of potassa and passing pure chlorine gas through the mixture until it is decomposed. The powder is then treated with nitric acid, washed with cold water and dried.

Uses.—Oxide of Bismuth has similar properties and uses as the subnitrate. The dose is from 5 to 15 grains.

303. Bismuthi Subcarbonas, U. S.

Subcarbonate of Bismuth.

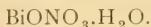


The present U. S. P. gives no process for preparing this salt, but it differs in composition from the Carbonate of Bismuth (299) only in containing one more volume of CO_3 in its molecule. The process formerly official was to dissolve 2 tr.ounces of Bismuth in $4\frac{1}{2}$ tr.ounces of nitric acid mixed with 4 fl.ounces of distilled water, and set aside for 24 hours; the solution was then diluted with 10 fl.ounces of distilled water, and after 24 hours filtered; 4 pints of distilled water were then added to the filtrate and the solution precipitated with 5 fl.ounces of water of ammonia. The precipitate was then to be washed and dissolved in 4 tr.ounces of nitric acid diluted with 4 fl.ounces of distilled water and after 24 hours filtered; 10 tr.ounces of carbonate of sodium are then to be dissolved by heat in 12 fl.ounces of distilled water, and the solution filtered and when cold the solution of Nitrate of Bismuth gradually added to it with constant stirring. The mass is then to be washed with distilled water until the washings are tasteless, then dried on bibulous paper with gentle heat, and rubbed to a powder.

Uses.—Astringent and tonic, similar to the subnitrate. Dose 5 to 10 grains.

304. Bismuthi Subnitrates.

Subnitrate of Bismuth—Oxynitrate of Bismuth.



No process for making this salt is now given in the U. S. P., but it may be made by the former official process, which is the same as for making the Subcarbonate of Bismuth, except that the solution of Acid Nitrate of Bismuth first made is precipitated with the solution of carbonate of sodium, and the second acid solution of Bismuth is precipitated with water of ammonia. The Br. P. directs it to be made as follows:

Purified Bismuth, in small pieces, . . . 2 ounces av.

Nitric Acid, 4 fl.ounces.

Distilled Water, a sufficiency.

“ Mix the nitric acid with three ounces of distilled water, and add the Bismuth in successive portions. When effervescence has ceased, apply for ten minutes a temperature approaching that of ebullition and decant the solution from any insoluble matter that may be present. Evaporate the solution until it is reduced to two fl.ounces, and pour it into half a gallon (80 fl.ounces) of distilled water. When the precipitate which forms has subsided, decant the supernatant liquid. Wash the precipitate, press and dry it at a temperature not exceeding 150°F.

Uses.—Subnitrate of Bismuth is used in pharmacy as the basis of many of the other Bismuth salts and for making various preparations. In medicine it is extensively employed as an astringent, tonic, and sedative. Dose, from 2 to 10 grains.

Other Salts of Bismuth.

Besides the foregoing official Salts of Bismuth, the following are sometimes used:

305. Bromide of Bismuth— BiBr_3 .—Made by adding bromine in excess to Metallic Bismuth, and when their combination is complete, collecting the steel-gray mass.

306. Basic Chloride of Bismuth— Bi_3Cl_3 . Made by dropping hydrochloric acid into a solution of Nitrate of Bismuth, collecting, washing and drying the precipitate. This is known as *Subchloride of Bismuth* or *Pearl Powder*, and is considerably used in face powders and liquid cosmetics.

307. Oxychloride of Bismuth— BiOCl .—By pouring a solution of Bismuth in nitric acid into a solution of chloride of sodium, collecting the precipitate, washing and drying.

308. Terchloride of Bismuth— BiCl_3 .—By mixing 2 parts of powdered bichloride of mercury with 1 part of powdered Bismuth, and heating until the mercury is driven off.

309. Chromate of Bismuth— $3 \text{ Bi}_2\text{O}_3 \cdot 2\text{CrO}$.—By adding a solution of Nitrate of Bismuth to a moderately concentrated solution of bichromate of potassium in slight excess, and collecting the precipitate.

310. Lactate of Bismuth.—By mixing the freshly precipitated moist Oxide of Bismuth, prepared from 10 parts of Subnitrate of Bismuth, by boiling with excess of solution of soda, with 9 parts of lactic acid, and drying the mass on a water-bath.

311. Oxalate of Bismuth— $\text{C}_6\text{Bi}_2\text{O}_{12} \cdot 15\text{H}_2\text{O}$.—By mixing Nitrate of Bismuth with a solution of oxalic acid, and collecting the precipitate.

312. Nitrate of Bismuth— $\text{Bi}(\text{NO}_3)_3$ —*Ter-* or *Tris-Nitrate of Bismuth*.—Made by dissolving Bismuth in sufficient nitric acid to effect its solution, adding to the solution half its volume of distilled water, filtering through glass-wool, evaporating and crystallizing. This is used for making some other Salts of Bismuth and for hair dye, etc.

313. Salicylate of Bismuth.—By dissolving Nitrate of Bismuth in glycerin, and adding to it a concentrated solution of salicylate of sodium, then collecting the precipitate.

314. Tannate of Bismuth.—By dissolving 22 parts Nitrate of Bismuth in the least requisite quantity of nitric acid diluted with half its weight of water, pouring the solution into an excess of solution of soda, collecting the precipitate, washing and triturating the moist precipitate with 10 parts tannin, rubbed with water, straining and drying.

315. Tartrate of Bismuth.—By adding a hot, concentrated solution of tartaric acid to a solution of Oxide of Bismuth in nitric acid, and washing the precipitate with an aqueous solution of tartaric acid.

316. Valerianate of Bismuth.—By dissolving Nitrate of Bismuth in the least requisite quantity of nitric acid, diluted with half its weight of water, then adding a concentrated solution of valerianate of sodium, washing the precipitate with water mixed with valerianic acid, and drying by gentle heat.

BORON.

Symbol, B; Atomic weight, 11; sp. gr. 2.68.

The element Boron is always found in nature associated with other substances, either as boric acid or a salt of boric acid.

Chemists have succeeded in obtaining an amorphous modification of Boron by heating boric anhydride, B_2O_3 , with sodium, which decomposes it. The sodium salt is then washed out, leaving a dark, brown powder. A crystalline modification is made by reducing the anhydride or oxide (B_2O_3) by the aid of aluminium at a very high temperature; then allowing to cool. The crystals thus produced are brownish, having a luster, refracting power and hardness nearly equal to the diamond; and are only slightly oxidized at the temperature at which diamond burns. In many respects Boron resembles carbon and silicon, and is therefore classed with them, chemically.

But few Boron compounds are used in pharmacy, only two being official, viz.: Boric Acid and Borax or Borate of Sodium.

317.

Acidum Boricum.

Boric Acid—(*Boracic Acid*).



Boric Acid is produced by decomposing Borax with sulphuric or hydrochloric acid. 2 parts of borax are dissolved in 8 parts of boiling water, and sulphuric acid added until the solution is distinctly acid. This requires about 1 part of the acid. As the solution cools, crystals of Boric Acid are deposited, which may be collected and washed on a filter with a little cold water. The crystals may be further purified by dissolving in boiling water and recrystallizing. It combines with some bases, forming Borates, and unites with other acids to form Boro-compound salts, as Boro-tartrate of Potassium, etc.

Metaboric Acid— HBO_2 —is prepared by heating Boric Acid to $38^\circ C.$ ($106^\circ F.$).

Pyroboric Acid— $H_2B_4O_7$ —is made by heating Boric Acid for a long time to $60^\circ C.$ ($140^\circ F.$).

Uses.—Boric Acid has remarkable antiseptic and preservative virtues, and is now much employed in solution and in powder as an antiseptic, both externally and internally. It is also used as a preservative of solutions, juices, fruits, meats, foods, etc., 1 per cent. being generally sufficient for the purpose. Alcoholic solution of Boric Acid burns with a green flame.

318. Boro-glyceride.

When heated with glycerin for a long time, Boric Acid parts with the elements of water and combines with the glycerin to form a new substance. It is made as follows:

Boric Acid, in fine powder, 62 parts.

Glycerin (by weight), 92 parts.

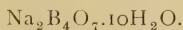
Heat the glycerin and gradually add the Boric Acid, continuing the heat until it no longer gives off vapor or loses weight, and until it will readily dissolve in water at ordinary temperature. The operation requires 10 to 12 hours to complete. In the earlier part of the process steam is given off freely from the water, which is set free, being vaporized; later it escapes more slowly owing to the viscosity of the melted mass.

The completed product when cool is a brittle and transparent solid of a light amber color and a shining fracture. It dissolves freely in warm water and in 5 parts of alcohol at 120° F.

Uses.—Boro-glyceride is an antiseptic, astringent, and mild escharotic. In solution it is used as a surgical dressing and injection for removing diseased mucous secretions and promoting healthy action.

319. Sodii Boras.

Borate or Biborate of Sodium—Borax.



Borax is an alkaline salt found native in California, where immense deposits of it exist in the basins of evaporated lakes and pools. It is also obtained from Thibet, Persia, and other localities, and it may be made by combining Boric Acid with Soda.

Uses.—In the industrial arts Borax is extensively employed for many purposes. It is used for washing and making some kinds of soap; as a flux, for refining metals and for welding, etc. In medicine it is used as an antacid and diuretic, and as

a soothing and healing wash for sores, especially for sore mouth. Its solution is used in pharmacy for saponifying fixed oils, whitening ointments, and for many purposes requiring a mild alkali.

BROMUM — BROMINE.

Symbol, Br.; Atomic Weight, 79.8; sp. gr. 2.96.

The element Bromine is a dense, dark-red, volatile liquid, boiling at 145.4° F. Its vapor is very irritating. It was discovered in 1826 by M. Balard, and on account of its analogies is chemically classed with chlorine and iodine. It is chiefly obtained from the mother liquor or *bittern* remaining after the crystallization of salt in salt-works. It combines energetically with other elements, forming salts called *Bromides*, many of which are extensively used in medicine.

Uses.—In pharmacy Bromine is used for making bromides, hydrobromic and phosphoric acids, and other preparations. In medicine it is seldom used internally, but its solution is sometimes employed as a cleansing or caustic wash, or as a gargle for diphtheria, etc.

Like chlorine, it possesses wonderful bleaching properties, and is sometimes used for that purpose.

The salts formed with Bromine and Bases are noticed under the bases with which the combinations are formed. The following are preparations of Bromine not otherwise classified:

320. Bromal— C_2Br_3HO .—This is an aldehyd derivative, prepared by the action of Bromine on ethyl alcohol. It is a colorless oily liquid, having sp. gr. 3.34, and boiling above 212° F. It is very irritating, therefore its use as a hypnotic or anæsthetic does not meet with favor. Combined with the elements of water, it forms a hydrate known as *Bromal Hydrate*, similar in appearance and uses to hydrate of chloral, but quite expensive and seldom used.

321. Bromoform— $CHBr_3$.—This is a colorless volatile liquid, obtained by distilling alcohol combined with bromide of calcium. Its sp. gr. is 2.90, and it boils at 305.6° F. It is similar in properties and uses to chloroform, but is much more irritating, therefore is not much used medicinally.

322. Bromic Acid— $HBrO_3$.—Made by decomposing bromate of barium with sulphuric acid, filtering the liquid from the precipitate and evaporating.

Bromates are salts formed by the combination of this acid with bases. This should not be confounded with *Hydrobromic Acid*, HBr , which is a gas, the solution of which is official. (See page 59.)

Some other combinations of Bromine are made, as *Chloride of Bromine*, *Iodide of Bromine*, *Bromacetic Acid*, and other compounds with acids, but are seldom employed in pharmacy.

BUTYL OR TETRYL.



Butyl is a gaseous radical—the fourth member of the homologous series, $\text{C}_n\text{H}_{2n+1}$, known as the alcohol radicals. It is known in pharmacy only in its compounds, as butyric ether, butyric acid, etc. Commercially, its alcohol, ether or acid are obtained from amylic alcohol, rancid butter or cheese, etc. Its name is derived from *butyrum* (butter), from which it was first obtained.

Its compounds with amyl and ethyl alcohols are considerably used in the manufacture of artificial fruit flavors—the butyrate of ethyl, or butyric ether, being known as *pineapple oil*. Butyric acid combines with bases to form salts called *Butyrates*.

The following are the principal combinations of Butyl employed in pharmacy, and not elsewhere classified :

223. Butyl-Chloral— $\text{C}_4\text{H}_9\text{Cl}_3\text{O}$.—Made by passing dry chlorine gas into aldehyd, which forms Chloral and Butyl-chloral, the latter being a dense, oily liquid of strong odor, which, by shaking with an excess of warm water, dissolves, and upon cooling deposits *Butyl Chloral-hydrate*, formerly called *Croton Chloral-hydrate*. Butyl Chloral-hydrate is employed for the same purposes as Chloral-hydrate, but in considerably smaller doses.

224. Butyric Acid— $\text{HC}_4\text{H}_7\text{O}_2$.—This is present in rancid butter and cheese, which derive from it their peculiar odor. It is also obtained by the oxidation of *butylic alcohol*, $\text{C}_4\text{H}_9\text{HO}$, which is usually found in crude amylic alcohol or fousel oil; and also in coal-tar. Butyric acid unites with organic radicals and metallic bases, forming *Butyrates*.

225. Butyrate of Amyl— $\text{C}_5\text{H}_{11}\text{C}_4\text{H}_7\text{O}_2$.—Made by heating together Butyric Acid, Sulphuric Acid and Amylic Alcohol, separating, distilling and purifying.

226. Butyrate of Ethyl— $\text{C}_2\text{H}_5\text{C}_4\text{H}_7\text{O}_2$.—By heating together Butyric Acid, Sulphuric Acid and Alcohol, separating, distilling and purifying. This is known commercially as *Butyric Ether*.

327.

Butyrum.*Butter.*

In pharmacy fresh unsalted Butter is frequently used as a base for ointments, and although not official, it may often be advantageously employed. It consists of about 30 per cent. of olein, 68 per cent. of palmitin and stearin, and glycerides of butyric and other fatty acids. The process of making butter from cream by agitation is too well known to require description.

In medicine Butter may be given as a food in place of cod liver oil. Medicines may be combined with it, or it may be made into an emulsion or jelly.

328. Butyrin.— By heating clarified Butter in a porcelain vessel for several days to 66° C., separating the oily portion, mixing it with an equal weight of alcohol and agitating it frequently for 24 hours, then pouring off the oily portion, evaporating it, treating the oily residuum with a little carbonate of magnesium, to remove free acid, separating, heating the remaining fatty matter in alcohol, filtering and evaporating. This is the chief neutral principle of Butter, and corresponds with Olein obtained from some other fats.

329.

Butterine.*Artificial Butter — Oleomargarine.*

Although the manufacture of Butterine does not come within the province of the pharmacist, yet an outline of the process by which it is made may be of interest. Beef fat or suet is washed, cut up and melted at from 122° to 124° F. The liquid fat is drawn off, allowed to settle, strained or filtered, and kept at a temperature of from 80° to 90° F., until the stearine and palmitine mostly crystallize out. They are then separated from the liquid portion and pressed by hydraulic pressure in a room heated to about the same temperature (80° to 90° F.). The portion that remains liquid at this temperature consists of Oleomargarine. It becomes solid when cool.

To make it into Butterine, it is churned while warm with milk (80 pounds of milk to 500 pounds of oil), and colored the desired shade, then run from the churn into a trough, where it is suddenly chilled by mixing it thoroughly with pounded

ice, thereby preventing it from crystallizing. It is then salted and worked like butter, and flavored usually with a little extract of tonka-bean to give it the odor of new-mown hay.

Its uses are similar to butter.

CADMIUM.

Symbol, Cd; Atomic weight, 112; sp. gr., 8.7.

Cadmium is a metallic element of a bluish-white color, resembling zinc, with which it is found associated in the ores, from which zinc is obtained. In distilling zinc containing cadmium, its vapor is lighter and passes over first. It is very malleable and ductile, and though it is similar to tin in general characteristics, it is harder and more tenacious. When heated to about 80°C ., it becomes very brittle, and may readily be powdered. Added to some other metals, in small proportions, it makes very fusible alloys (see page 191). Heated with oxygen, it forms an oxide, CdO . It combines with chlorine, iodine, bromine, and sulphur, forming salts, which are used in photography and as pigments.

The following are the principal Salts of Cadmium:

330. Bromide of Cadmium — CdBr_2 .— By adding a solution of bromide of potassium to a solution of sulphate of Cadmium, double decomposition occurs, sulphate of potassium being precipitated, and the solution of bromide of Cadmium poured off, concentrated and crystallized. Used in photography.

331. Carbonate of Cadmium — CdCO_3 .— By adding a solution of Nitrate of Cadmium to a solution of carbonate of sodium, collecting the precipitate, washing and drying.

332. Chloride of Cadmium — CdCl_2 .— By dissolving carbonate of Cadmium in dilute hydrochloric acid, concentrating the solution and crystallizing.

333. Iodide of Cadmium — CdI_2 .— By double decomposition between iodide of potassium and sulphate of Cadmium, the same as in making bromide of calcium. This is used for sensitizing photographic plates. It is also used in medicine as an alterative.

334. Nitrate of Cadmium — Cd_2NO_3 .— By dissolving metallic Cadmium in nitric acid, concentrating and crystallizing.

335. Oxide of Cadmium— CdO .—By igniting the nitrate or carbonate. A suboxide of Cadmium, Cd_2O , is also known.

336. Sulphate of Cadmium— $\text{CdSO}_4 \cdot 4\text{H}_2\text{O}$.—By treating carbonate or oxide of Cadmium with diluted sulphuric acid.

337. Sulphide of Cadmium— CdS .—By passing a current of hydrosulphuric acid through a solution of chloride of Cadmium. This is a brilliant yellow pigment.

CÆSIUM.

Symbol, Cs; Atomic weight, 132.7.

The element Cæsium is closely related to potassium and the other metals of the alkalies. It has not yet been isolated, but an amalgam has been obtained by submitting its chloride to electrolysis, employing a globule of mercury as the negative electrode. It is the most electro-positive metal known. Its chloride is the only salt which has been described, or which is known to pharmacy, and this is only interesting as a rare and expensive chemical.

CALCIUM.

Symbol, Ca; Atomic weight, 40; sp. gr., 1.57.

Calcium is a strongly positive element, occurring abundantly in nature as carbonate, phosphate, silicate, chloride, etc.; its compounds forming a large proportion of the crust of the earth. Its oxide is Calx or lime, and the salts of Calcium are generally, though improperly, called salts of lime.

The metal Calcium was first obtained from lime by Sir H. Davy, in 1808. It is classed with barium, strontium and magnesium. It is of a light-yellow color, rather harder than lead, very malleable, ductile, and melts at about 500°C . Its salts are very extensively used in the arts and industries, and are considerably employed in pharmacy and medicine. The salts of Calcium in solution give a white precipitate with carbonate of ammonium, and, if concentrated, with sulphuric acid also.

The following are the official salts of Calcium:

338. **Calcii Bromidum, U. S.**

Bromide of Calcium.



Hydrobromic acid, any convenient quantity.

Precipitated chalk (calcium carbonate), a sufficiency.

Add the precipitated chalk to the hydrobromic acid, a little at a time, until a portion remains undissolved after standing a few hours, then filter and evaporate the solution to dryness, stirring while drying to granulate the salt.

Uses.—Bromide of Calcium is used as a hypnotic, and for nervous irritability, in doses of 20 to 60 grains.

339. **Calcii Carbonas Præcipitatus.**

Precipitated Carbonate of Calcium—Precipitated Chalk.



The U. S. P. does not give a process for making this salt, but the Br. P. directs as follows:

Chloride of Calcium, 5 ounces av.

Carbonate of Sodium, 13 ounces av.

Boiling Distilled Water, a sufficiency.

Dissolve the Chloride of Calcium and Carbonate of Sodium each in two pints of the water. Well mix the two solutions, and allow the precipitate to subside, collect on a calico filter, and wash it with boiling distilled water until the washings cease to give a precipitate with nitrate of silver, and dry the product at the temperature of boiling water, 212° F.

Uses.—This powder is more commonly known as English precipitated chalk, and is much used in tooth powders, toilet powders, etc. It is also used in medicine in the form of powders, troches, etc., and is frequently employed for making chalk mixture, but is not considered so good for that purpose as prepared chalk. The dose is 10 to 30 grains or more.

340. Creta Præparata.

Prepared Chalk, Prepared Carbonate of Calcium.

Although this substance is not classed in the pharmacopœias under the heading Calcium, it properly belongs there, as it is "native, friable, Carbonate of Calcium, CaCO_3 , freed from most of its impurities by elutriation." This is prepared from common chalk, which is native, friable, Carbonate of Calcium, by rubbing it with a little water into fine powder, then transferring it to a large vessel nearly full of water, stirring thoroughly, and, after a moment, while the supernatant liquor is still turbid, pouring it off into another vessel. The coarser particles of chalk, which remain in the first vessel, are then treated again with water in the same manner, the liquid poured off and added to the portion formerly decanted. The suspended chalk is now allowed to subside, the water poured off, and the powder dried or made into little cones or "drops" by running through a paint mill.

Uses.—Prepared chalk is an antacid, used medicinally almost altogether when Carbonate of Calcium is indicated. It is given in diarrhœa, acid stomach, etc. Also used in making toilet powders. Dose, 10 to 30 grains or more.

Whiting is a cheap prepared chalk used for whitening walls, polishing, etc.

341. Calcii Chloridum.

Chloride of Calcium.



Chloride of Calcium may be prepared by neutralizing hydrochloric acid with chalk or marble, adding a little solution of chlorinated lime and slacked lime to the solution, filtering, evaporating the filtrate to dryness, and then heating to redness. The fused salt thus prepared is used to dry gases, and in pharmacy as the basis of some other calcium salts. A solution made with it is official in the Br. P. This salt should not be mistaken for chlorinated lime, which is more frequently called "chloride of lime."

342. **Calcii Hypophosphis.***Hypophosphite of Calcium (Lime).*

This salt is most conveniently prepared by heating two parts of Hydrate of Calcium (slacked lime) with 1 part of phosphorus and 10 parts of water, until phosphuretted hydrogen gas ceases to be evolved, then filtering the liquid to separate insoluble matter, concentrating the filtrate by evaporation, refiltering, evaporating again until a pellicle appears on the surface; then setting aside to crystallize or continuing the heat, and stirring to granulate. In conducting this process it is necessary to provide for the escape of the gas, which is inflammable, by means of a hood adjusted over the vessel in which the mixture is heated. The evaporation should also be at a low temperature, not over 185° F.

Uses.—In pharmacy this salt is used for preparing other hypophosphites and hypophosphorous acid; in syrups, etc. In medicine it is employed in wasting diseases, coughs, defective nutrition, nervous anemia, etc. The dose is from 5 to 30 grains, usually given in the form of syrup, solution or emulsion.

343. **Calcii Phosphas Præcipitatus.***Precipitated Phosphate of Calcium (Lime).*

Bone Ash, powdered,	4 tr.ounces.
Hydrochloric Acid,	8 tr.ounces.
Water of Ammonia, q. s. or	12 fl.ounces.
Distilled Water, a sufficient quantity.	

Macerate the Bone Ash in the hydrochloric acid, diluted with a pint of distilled water until it is dissolved, and filter the solution. Add a pint of distilled water through the filter, and then gradually add water of ammonia until the liquid shows an alkaline reaction. Mix the magma (precipitate) with twice its bulk of boiling distilled water, and pour the whole upon a

calico strainer. Wash the precipitate on the strainer with boiling distilled water until the washings cease to give a cloudiness with solution of nitrate of silver acidulated with nitric acid; and, lastly, dry by gentle heat.

Uses.—Precipitated phosphate of Calcium, or Phosphate of Lime as it is generally called, is used for preparing solutions of phosphates and lacto-phosphates compound, and many other preparations used in pharmacy; also in making medicated waters. In medicine it is employed as an antacid, osseous, nutritive, etc. The dose is from 10 to 30 grains.

344.

Calx.

Lime — Oxide of Calcium.

Lime is made by calcining or “burning” lime-stone, marble, or chalk, thus expelling the carbonic acid gas. It is an alkaline earth, much employed for building and other useful purposes, and in pharmacy is extensively used in making many galenicals. In medicine it is sometime employed as an escharotic, and its solution (lime-water) is extensively prescribed and used both internally and externally.

345.

Calcii Hydras.

Hydrate of Lime — Slacked Lime.

This is so common a preparation that it scarcely needs a formula, but it may not be out of place to give the Br. official directions for making it:

Lime,	2 pounds av.
Distilled Water,	20 fl.ounces.

Place the Lime in a metal pot, pour the water upon it, and when vapor ceases to be disengaged cover the pot with its lid and set it aside to cool. When cool, pass through a sieve and keep in well-stopped bottles excluded from the air. Slacked Lime is used to prepare *Liquor Calcis*, or Lime Water, and *Syrupus Calcis*, or Syrup of Lime.

346. Calx Chlorata, U. S., Calx Chlorinata, Br.

Chlorinated Lime — (Chloride of Lime).

This preparation is made by exposing slacked lime to the action of chlorine so long as the gas is absorbed. It is extensively used for bleaching and disinfecting, and is familiarly known as *Bleaching Powder*.

Freshly prepared Chloride of Lime contains from 30 to 35 per cent. of Chlorine, but loses most of it by age or exposure.

In pharmacy it is used for making several preparations, and is much employed as a cheap deodorizer and disinfectant. Chlorinated Lime should not be mistaken for Chloride of Calcium, which is a true calcium salt.

347. Calcii Sulphurata.

Sulphurated Lime — Sulphide of Calcium.

The U. S. P. defines this as "a mixture consisting chiefly of Sulphide of Calcium (CaS) and Sulphate of Calcium (CaSO_4) in varying proportions, but containing not less than 36 per cent. of absolute Sulphide of Calcium." The Br. P. describes it as "a mixture containing not less than 50 per cent. of Sulphide of Calcium."

As the processes for making it vary considerably, and are not expedient, except for manufacturing chemists, they are not here repeated.

Uses.—This substance is used as a depilatory, and sometimes in ointments. It is also given internally for skin diseases and as an alterative, in doses of $\frac{1}{2}$ to 1 grain.

Other Calcium Salts.

Besides the foregoing official salts of Calcium, several unofficial salts are sometimes used:

348. Fluoride of Calcium— CaF_2 .—This salt occurs native, and is known as *Fluor-Spar*. It may also be prepared by acting upon lime with hydrofluoric acid.

349. Iodate of Calcium — $\text{Ca}_2\text{IO}_3 \cdot 6\text{H}_2\text{O}$. — By gradually adding a filtered solution of chlorinated lime to an alcoholic solution of iodine, and when the solution is colorless, acidulating with a little hydrochloric acid, boiling, filtering, and crystallizing.

350. Iodide of Calcium — CaI_2 . — By dissolving slacked lime in hydriodic acid, until neutralized, then concentrating and crystallizing. This salt is considerably used as an alternative, in doses of $\frac{1}{8}$ to 2 grains.

351. Sulphides of Calcium. — With sulphur, Calcium forms several sulphides, as follows: *Sulphide of Calcium* — CaS . — Made by exposing Sulphate of Calcium at a high temperature to a current of hydrogen gas. *Bisulphide of Calcium* — CaS_2 . — By boiling slaked lime and sulphur, equal parts, in water until a solution is obtained, filtering, concentrating and crystallizing. *Pentasulphide of Calcium* — CaS_5 . — By using double the quantity of sulphur as for the former, and continuing the boiling longer. *Oxysulphide of Calcium*. — By mixing 1 part of sulphur with 3 parts of slaked lime and 5 parts of water, and boiling until a portion dropped upon a cold slab will solidify.

352. Sulphate of Calcium — $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. — This is found abundantly in nature, and is known as *gypsum*. When calcined $2\text{H}_2\text{O}$ is driven off, and when ground this is known as *calcined plaster*, *Plaster of Paris*, or *Dentists' plaster*.

353. Sulphide of Calcium — CaSO_3 . — By mixing concentrated solutions of sulphide of sodium and chloride of calcium, and collecting, washing and drying the precipitate.

This preparation has had a large sale formerly under the name *Sulphite of Lime*, as a preservative for cider.

CARBONIUM — CARBON.

Symbol, C; Atomic weight, 12.

Carbon is one of the most important and widely distributed elements. It exists in nature in a great variety of forms, differing widely in appearance and characteristics. The diamond and graphite are familiar forms of crystallized carbon; lamp-black and wood charcoal are forms of impure amorphous carbon. It is a constituent of all animal and vegetable substances, and has therefore been called the "Organic element." It is present in all alkaloids and neutral principles of plants, and its compounds include the greater part of the substances most valuable in pharmacy and medicine.

354.

Carbo Animalis.*Animal Charcoal.*

Animal Charcoal is known commercially as *ivory-black* or *bone-black*, and is prepared in a large way by first boiling bones in water to free them from fat and adhering particles, and then subjecting them to destructive distillation in iron cylinders, by which process they are deprived of their volatile portions, as ammoniacal liquor, or *bone spirit* and tar, or *bone oil*, and become charred, consisting mainly of carbon and calcium salts.

Uses.— Animal charcoal is extensively used for decolorizing substances by filtering them through it, especially for refining sugar, making petrolatum, etc.; also for making blacking for shoes and as a pigment. For pharmaceutical use, purified animal charcoal should be used.

355.

Carbo Animalis Purificatus.*Purified Animal Charcoal.*

Animal Charcoal, 2 parts or 8 ounces av.

Hydrochloric Acid, 3 parts or 10 fl.ounces.

Water, a sufficient quantity.

Pour the hydrochloric acid, previously mixed with 4 pints of water, upon the animal charcoal and digest the mixture on a water-bath for 24 hours, occasionally stirring (this is for the purpose of dissolving the calcium salts which are present); then pour off the supernatant liquid and digest the undissolved portion with 4 pints of water for two hours, transfer the mixture to a strainer, and when the liquid portion has run off, wash the residue with water until the washings give no cloud with a solution of nitrate of silver; then dry the product and heat it to dull redness in a covered crucible.

Uses.— Thus treated, the crude bone-black becomes pure carbon, which may be used for delicate chemical or pharmaceutical operations. It is chiefly used for filtering and decolorizing solutions of alkaloids and fine chemicals.

356. Carbo Ligni.

Charcoal — Wood-Charcoal.

This is prepared for commerce by charcoal-burners, who pile billets of wood in conical form, cover the pile with earth, ignite it from the bottom, and then close it from access of air, leaving the process to go on without consuming the wood, which is by the heat deprived of its oxygen, hydrogen, etc. leaving charcoal or carbon as the result of the operation.

For pharmaceutical use, charcoal prepared from willow is preferred.

Uses.— In pharmacy, powdered charcoal is used for filtering many substances that cannot be made clear by ordinary filtering processes. It is also used in tooth powders. In medicine it is given in doses of one or two drachms as an antiseptic, and absorbent especially in gastric derangements. On account of its absorbent qualities, it should be kept in tight tin cans or bottles.

357. Carboni Bisulphidum.

Bisulphide of Carbon.



This is a clear, colorless, very volatile and inflammable liquid, having sp. gr. 1.272.

It is made by combining the vapor of sulphur with carbon, collecting the gaseous product by means of condensing tubes, agitating the liquid with mercury, and distilling it in contact with white wax. Crude Disulphide of Carbon has a very disagreeable odor, like rotten eggs, but this may be almost entirely removed by repeated rectification. It is never prepared except by manufacturing chemists, who have appropriate apparatus for making it.

Uses.— Bisulphide of Carbon is a powerful solvent of fats, resins, rubber, etc., and is used in pharmacy chiefly for that purpose. Its vapor is sometimes used in the form of spray in surgical operations, but it is not administered internally. It is

also a powerful antiseptic, and is used to preserve animal and vegetable substances.

Other Carbon Compounds.

Besides its combination with sulphur, which is official, carbon combines with chlorine in several proportions, with oxygen in two proportions, and with hydrogen in many proportions, forming a series of important radicals :

358. Chlorides of Carbon.—A *Chloride of Carbon* is obtained from its sesqui-chloride by subliming it repeatedly through a tube filled with fragments of glass heated to redness. It is a transparent aromatic liquid. *Sesqui-chloride of Carbon*— C_2Cl_6 —is obtained by exposing Dutch liquid with chlorine in a glass vessel to the direct rays of the sun, and renewing the chlorine as long as it is absorbed. The liquid is thus converted into a white crystalline volatile solid. *Tetrachloride of Carbon*, or *Bichloride of Carbon*, is made by a complicated process. It is a colorless liquid, sometimes used as an anæsthetic. *Oxychloride of Carbon*— $COCl_2$ —is a gas made by mixing equal volumes of carbonic oxide and chlorine and exposing them to the rays of the sun.

359. Hydrides of Carbon.—With hydrogen, carbon unites in many proportions, forming a series of radicals known as the hydro-carbon series, or alcohol radicals. Beginning with methane or marsh-gas, CH_4 , this series increases by CH_2 , forming the radicals ethyl or ethane, C_2H_6 , propyl or propane, C_3H_8 , butyl or tetrane, C_4H_{10} , amyl or pentane, C_5H_{12} , etc. In pharmacy these radicals are bases of very important preparations, which are extensively used.

Carburetted Hydrogen is a term applied to two of the compounds of carbon and hydrogen, namely *Light Carburetted Hydrogen*, CH_4 , marsh-gas or fire-damp; *Heavy Carburetted Hydrogen*, C_2H_4 , olefiant gas or ethylene.

360. Oxides of Carbon.—With oxygen carbon forms at least two combinations, *carbon oxide* and *carbon dioxide*.

361. Oxide of Carbon— CO —This is produced when carbon is burned in an insufficient supply of oxygen, or may be made by passing carbonic acid gas over charcoal heated to dull redness, and then washing the gas through milk of lime to remove carbonic acid. It burns in the air, uniting with oxygen, and being converted into carbon dioxide.

362. Dioxide of Carbon— CO_2 , *Carbonic Anhydride*, more commonly called *Carbonic Acid*. This gas is produced by the union of carbon and oxygen, as in the ordinary process of combustion, and is disengaged in the process of fermentation and other natural operations. It is present to a small extent in the atmosphere, and is abundant in the carbonate earths and in all vegetable and animal substances. It may be obtained by adding sulphuric

or hydrochloric acids to marble, whiting, or other carbonates, and collecting the gas. Its further description and characteristics will be found in FENNER'S PRACTICAL CHEMISTRY.

Uses.— In pharmacy this gas is chiefly used for making carbonated water or "soda water," so generally dispensed by druggists.

363. True Carbonic Acid— H_2CO_3 .— This is the acid which forms with bases the important class of salts called *Carbonates*. It has not been satisfactorily obtained as a free acid, but is known to exist by the action of carbon dioxide on basic radicals in the presence of water.

CERÆ — WAXES.

Wax is a general name for a variety of peculiar, concrete substances resembling beeswax. Although the varieties used are few, they are obtained from the animal, vegetable and mineral kingdoms, and serve important and useful purposes that could not well be supplied by other substances. In the arts beeswax is extensively used for modeling, making molds, electrotyping, etching, etc. In pharmacy it is used for making cerates, ointments, and other similar galenicals. Other varieties of wax are but little used in comparison with beeswax, but some of them are now being employed in place of it for some purposes, as they can be obtained at lower prices.

The following are the varieties of wax known and used in pharmacy, Beeswax only being official:

364. Cera Flava.

Yellow Wax, Beeswax.

This is obtained by melting the honey-cells of the common honey-bee, *Apis Mellifica*, and is purified by straining and agitating with hot water while fluid. It is then poured into pans containing a little hot water, when most of the impurities subside, and may be scraped from the under surface of the cake when cold.

Beeswax is composed of three different substances, namely, *Myricin*, *Ceratic Acid* and *Cerolein*. These substances may be

separated by boiling wax in alcohol; the first remains undissolved; the second dissolves but crystallizes out upon cooling; the third remains in solution in the cold alcohol.

Uses.—Yellow Wax is used in the arts for molding, etc., and in pharmacy for making some kinds of cerates and ointments, when the color is not objectionable. It is better in many respects for cerates, etc., than white wax, which is prepared from it.

365.

Cera Alba.

White Wax.

White Wax is Beeswax bleached by exposing yellow wax in thin layers to the action of light, air, and moisture. It is prepared in a commercial way by first melting yellow wax and making it into thin sheets, which are spread upon linen cloths stretched upon frames, moistened occasionally and exposed to the air and light until the color is partly discharged. The wax is then gathered, melted, and sheeted as before, and again bleached in the same manner, and the operation is continued until it is considered sufficiently white for the market, when it is melted and run into round or square cakes.

Uses.—White Wax is considerably used in the form of thin sheets for making wax-flowers and other artistic work. It may be sheeted for this purpose by melting on water and plunging a round bottle in the melted mass. When withdrawn a thin coating of wax adheres to the bottle, which, when cut, comes off in sheets. In pharmacy it is used in making the light colored cerates, and to give consistence to some of the white ointments.

Other kinds of Wax.

The following are varieties of wax obtained from natural sources:

366. Bay Wax, Myrtle Wax, or Bayberry Tallow.—This is obtained from the fruit of the Wax Myrtle by boiling it in water, the wax or fat

collecting on the surface. It is greenish-yellow, has a balsamic odor, and is harder and more brittle than beeswax. It is sometimes used in ointments, and for making candles, from which the fruit is called *Candleberry*.

367. Carnauba Wax.—Obtained from the leaves of the Wax Palm by boiling them in water and collecting the wax which rises to the surface. This wax is extensively used for the manufacture of candles, and also for making varnish. It is not used in pharmacy.

368. Japan Wax.—A species of wax or turpentine obtained from *Rhus Succedaneum* of Japan. It is used chiefly for making varnish and candles.

369. Ozokerite or Ceresin—*Mineral Wax, Earth Wax.*—This is a species of wax obtained from mineral deposits in various parts of the country, but chiefly from Austrian-Poland. It is found in the fissures of shale or slate, from which it is obtained by fusion. When refined it so closely resembles yellow beeswax as to be readily sold for it, and it may be used for the same purposes.

370. Paraffin Wax.—The solid, white crystalline hydro-carbon obtained from petroleum by chilling it with ice, pouring off what remains liquid, and subjecting the remaining semi-solid mass to pressure, is called Paraffin or Paraffin Wax. It considerably resembles White Wax, and is sometimes used to adulterate it. It varies considerably in hardness, according as more or less of the soft Paraffines remain combined with it. It is used instead of Beeswax for many purposes, and may be employed in making ointments and cerates, but is not so satisfactory as Beeswax. It is used for making corks impervious to chemicals, for sealing bottles, covering jelly, etc.

The following are preparations made of various substances and known as Waxes:

371. Gilding Wax.—Made of Beeswax 4 ounces, Verdigris 1 ounce, Red Ochre 1 ounce, powdered Alum 1 ounce, melted and mixed together.

372. Modeling Wax.—Made of Beeswax, Lead Plaster, Olive Oil and Yellow Resin, each equal parts, with whiting sufficient to form a mass.

373. Sealing Wax.—The basis of the best Sealing Wax is made as follows:

Pale Shellac, 8 ounces.

Venice Turpentine, 2½ ounces.

Coloring as desired, a sufficiency.

Melt the Shellac carefully in a bright copper vessel, and add the Venice Turpentine, then stir in the coloring and mould the wax into sticks, which may be stamped or pressed as desired. The best *red* sealing wax is made by adding 6 ounces of vermilion to the above quantity; a cheaper red wax can be made by using red lead instead. The best *black* is made by adding 5 ounces of very finely powdered ivory-black to the above quantity. Other colors may be made by adding other pigments.

Cheaper Sealing Wax may be made as follows :

Resin,	1 pound av.
Shellac,	8 ounces.
Venice Turpentine,	6 ounces.
Coloring as desired, a sufficient quantity.	

Melt together and stir in the coloring.

Soft Sealing Wax for official documents and express packages may be made with :

Resin,	8 ounces.
Beeswax,	8 ounces.
Olive Oil,	5 ounces.
Venice Turpentine,	12 ounces.
Coloring as desired, a sufficiency.	

Melt together and stir in the coloring.

Bottle Wax may be made from :

Resin,	12 ounces.
Beeswax,	2 ounces.
Burgundy Pitch,	2 ounces.

Melt together and color red with red lead or Venetian red; black with ivory black; green with verdigris or chrome green; brown with umber, etc.

CERATA—CERATES.

Cerates are preparations composed of wax combined with fatty or resinous substances, and intended to be spread upon lint, linen, or other similar material, to be used externally.

They are of firmer consistence than ointments, and are mostly designed rather to protect the parts to which they are applied, than to be absorbed, as is expected of ointments.

The British and German Pharmacopœias make no class distinction between Cerates and Ointments, but such a classification seems quite proper when the difference in the uses to which they are applied is considered.

The use of lard in some of the Cerates, which has formerly been common, although still retained in the official formulas, has been mostly superseded by petrolatum, because of its better keeping qualities and general adaptability to the purpose; in the formulæ for Cerates which follow, therefore, it will be

understood that when "lard or petrolatum" is directed, lard is mentioned, because it is directed in the U. S. P., but petrolatum is preferable.

To secure uniformity of the mass, and prevent granulation of the wax, most of the Cerates are stirred while cooling. This also makes them whiter and lighter as regards their specific gravity, by introducing air.

Paraffin is sometimes used in making Cerates instead of beeswax, but it does not make so satisfactory a preparation.

The following are the Cerates official in the U. S. P.:

374. Ceratum.

Cerate or Simple Cerate.

White Wax, 3 ounces.

Lard (or White Petrolatum), 7 ounces.

Melt them together, and stir the mixture constantly until cool.

Uses.—This is the base known as "Simple Cerate," with which medicinal substances are incorporated when desired to be used in this form. It is also used as a simple dressing for sores, blisters, etc.

375. Ceratum Camphoræ.

Camphor Cerate.

Camphor Liniment (1 part Camphor, 4 parts

Cotton Seed Oil), 1 ounce.

Olive Oil, 4 ounces.

Cerate, 28 $\frac{1}{3}$ ounces.

Mix the Camphor Liniment and the Olive Oil, and incorporate with the Cerate.

MADE WITH PETROLATUM.

Camphor, in fine powder, $\frac{1}{4}$ ounce.

White Wax, or Paraffin, 8 ounces.

Petrolatum, 24 ounces.

Melt the Wax and the Petrolatum, and while cooling, but still liquid, add the Camphor.

Uses.—In Pharmacy, Camphor Cerate is used for making Goulard's Cerate, and is frequently prescribed combined with other substances desired in the form of a cerate.

376. Ceratum Cantharidis.

Cantharides Cerate, Blistering Cerate, or "Blister Plaster."

Cantharides, No. 60 powder,	7 ounces.
Yellow Wax,	4 ounces.
Resin,	4 ounces.
Lard (or Petrolatum),	5 ounces.

To the Wax, Resin and Lard, or Petrolatum, previously melted together and strained through muslin, add the Cantharides, and by means of a water-bath keep the mixture in a liquid state for half an hour, stirring constantly. Then remove from the water-bath and stir constantly until cool.

In the British Pharmacopœia a similar preparation is given under the name

EMPLASTRUM CANTHARIDIS.

Cantharides Plaster.

Cantharides, in powder,	12 ounces.
Yellow Wax, } of each,	7½ ounces.
Prepared Suet, }	
Prepared Lard,	6 ounces.
Resin,	3 ounces.

Liquefy the Wax, Suet and Lard together by a water-bath, and add the Resin, previously melted; then introduce the Cantharides, mix the whole thoroughly, and continue to stir the mixture while it is allowed to cool.

Uses.—Cantharides Cerate is used in pharmacy in combination with Burgundy Pitch for making Warming Plaster, and in many other irritating plasters and ointments. In medicine "Blister Plaster" is an old-time remedy, too well known to require further notice. It may be spread on stiff paper, cloth or skin, and applied.

377. Ceratum Cetacei.*Spermaceti Cerate.*

Spermaceti,	2 ounces.
White Wax,	7 ounces.
Olive Oil,	11 ounces.

Melt together the Spermaceti and Wax, then add the Olive Oil, previously heated, and stir the mixture constantly until cool. Unless the best imported olive oil is used, the preparation has a disagreeable odor; and even when made with the best materials it soon becomes rancid. It is just as efficient, cheaper, and entirely permanent, made with petrolatum.

MADE WITH PETROLATUM.

Spermaceti,	1 ounce.
White Wax, or Paraffin,	2 ounces.
Petrolatum,	7 ounces.

Melt together and stir while cooling. This Cerate is used as a dressing and healing salve.

378. Ceratum Extracti Cantharidis.*Cerate of Extract of Cantharides.*

Cantharides, in No. 60 powder, . . .	6 ounces av.
Resin,	3 ounces av.
Yellow Wax,	7 ounces av.
Lard (or Petrolatum),	7 ounces av.
Alcohol, a sufficient quantity.	

Moisten the Cantharides with two fl.ounces of Alcohol, and pack firmly in the water-bath percolator. Pour upon it a pint of Alcohol, and set in a warm place for two days; then heat very moderately, and, after one hour, begin to percolate, adding Alcohol to the drug, and continuing the heat and percolation until 20 fl.ounces have passed. Distill off a pint of Alcohol, and evaporate the remainder, if necessary, to 3 ounces; add to this the Resin, Wax and Lard, or Petrolatum, previously melted together, and keep the whole at the boiling point of

water for 15 minutes; then strain the mixture through muslin and stir until cool.

It is well known that heat assists very materially to dissolve the active principle of Cantharides, *Cantharidin*. Therefore, the water-bath percolator is useful in making the preparation, both as regards efficiency of the product, and economy in making. The U. S. 1880 preparation is about 20 per cent. stronger than the 1870.

Uses.—Similar to Cantharides Cerate.

379. Ceratum Plumbi Subacetatis.

Cerate of Subacetate of Lead—Goulard's Cerate.

Solution Subacetate of Lead by weight, . . . 2 ounces.

Camphor Cerate, 8 ounces.

Mix them thoroughly. This Cerate should be freshly prepared when wanted for use.

MADE WITH PETROLATUM.

Solution Subacetate of Lead, by weight, $2\frac{1}{2}$ ounces.

Paraffin, 3 ounces.

Petrolatum, 7 ounces.

Camphor, in fine powder, 3 grains.

Melt the Paraffin with the Petrolatum, and when cooling add the Camphor. When it begins to solidify add the solution, and stir constantly with a wooden or horn spatula until cool.

Uses.—This Cerate is used as a soothing application to inflamed parts.

380. Ceratum Resinæ.

Resin Cerate, Basilicon Ointment.

Resin, 7 ounces.

Yellow Wax, 3 ounces.

Lard (or Petrolatum), 10 ounces.

Melt them together at a moderate heat, strain the mixture through muslin, and allow to cool without stirring.

Uses.—This Cerate is used in pharmacy for the preparation

of turpentine liniment, and as the base of many compound Cerates which are prescribed by physicians. It is healing and stimulating.

381. Ceratum Resinæ Compositum.

Compound Resin Cerate.

Although this Cerate is deleted in the 1880 Pharmacopœia, it is still frequently prescribed; the formula is as follows:

Resin,	2 ounces.
Yellow Wax,	2 ounces.
Turpentine (Gum Thus),	1 ounce.
Petrolatum,	3 ounces.

Melt them together, strain, and stir until cool.

This differs from the 1870 formula in substituting Petrolatum for Suet and Flaxseed Oil.

Uses.—The uses of this Cerate are similar to simple Resin Cerate, but it is more stimulating.

382. Ceratum Sabinæ.

Savine Cerate.

Fluid Extract of Savine,	2½ ounces av.
Resin Cerate,	9 ounces av.

Melt the Resin Cerate, add the Fluid Extract of Savine, and heat moderately until the Alcohol has evaporated; then stir constantly until cool.

Uses.—This is a stimulating irritant, sometimes employed instead of Cantharides Cerate. It is but little used in this country.

383. Ceratum Saponis.

Soap Cerate.

Why this Cerate is omitted in the 1880 U. S. Pharmacopœia is not apparent, as it is prescribed as frequently as many of the

Cerates that remain; the formula is therefore given for it as prepared with Petrolatum:

Soap Plaster,	2	ounces.
Yellow Wax,	1	ounce.
Petrolatum,	5½	ounces.

Melt the Plaster and Wax together and add the Petrolatum; continue the heat until it is liquefied, then stir the mixture until cool.

Uses.—Soap Cerate is a valuable cleansing application to indolent sores and ulcers.

Other Cerates.

The foregoing official Cerates include nearly all for which there is a demand in this country. Many other preparations that are frequently called Cerates will be found under the heading UNGUENTA. A great many preparations that are simply mixtures of a medicinal substance with Cerate are sometimes prescribed by name, as Opium Cerate, Quinine Cerate, etc.; but it seems unnecessary to give detailed formulas for them.

The following have been popular or well-known Cerates, some of them having been official in European Pharmacopœias:

384. Cerate, Acetate of Lead.

White Wax,	5	ounces av.
Olive Oil,	20	fl.ounces.
Acetate of Lead, in fine powder,	5	drachms.

Triturate the Acetate of Lead with 2 ounces of the Olive Oil, and having melted the White Wax with the Olive Oil by the aid of heat, add the mixture and stir until cool. This Cerate was formerly official in the London Pharmacopœia, but is now little used, the Cerate of Subacetate of Lead being used instead.

385. Cerate, Calamine.

Turner's Cerate.

Yellow Wax,	3¼	ounces av.
Olive Oil,	10	fl.ounces.
Prepared Calamine,	3¼	ounces av.

Melt the Wax with the Oil, and when cool enough to begin to thicken, add the Calamine, and stir until cool. This may also be prepared by mixing 1 part of Prepared Calamine with 5 parts of Simple Cerate.

This has long been popular under the name of Turner's Cerate, as a drying, healing dressing for sores, ulcers, etc.

386. Cerate Cosmetic, or Cold Cream.

Oil of Sweet Almonds,	8 fl.ounces.
White Wax,	1 ounce av.
Spermaceti,	1 ounce av.
Rose Water,	5 fl.ounces.
Borax, in fine powder,	4 drachms.

Melt the Wax and Spermaceti in the Almond Oil by aid of heat; dissolve the Borax in the Rose Water, and when the melted Wax, etc., is cooling, gradually add the solution of Borax, beating or agitating with a wooden spatula until cold.

This makes a Cold Cream base, to which other ingredients may be added if desired. If other perfuming oils are required, mix them with the mass while agitating and nearly cool; if it is desired to add Glycerin, add it to the solution of Borax in Rose Water. Camphor may be dissolved in the melted mass while warm. Tincture of Benzoin added to the melted mass gives it an agreeable odor, and helps materially to preserve it. 1 ounce is sufficient for the above quantity.

It may be made firmer by using a larger proportion of Wax. Petrolatum may be used instead of Oil of Almonds. Cologne, or bulk perfumes of any kind, may be incorporated, etc.

Uses.—Cold Cream is used to soften the skin, for chap, sun-burn, sores, and all purposes where a soft soothing ointment is desired.

387. Cerate of Galen.

Cerat de Galien, Fr.

Oil of Sweet Almonds,	8 fl.ounces.
White Wax,	2 ounces av.
Rose Water,	6 fl.ounces.

Melt the Wax in the Oil by heat, and while cooling gradually add the Rose Water, beating it in with a wooden spatula.

This Cerate is considerably used in French pharmacy as a cerate or ointment base. It is similar to cold cream or rose-water ointment, and is used for similar purposes.

388. Cerate, Kirkland's.

Kirkland's Neutral Cerate.

Lead Plaster,	8 ounces av.
Olive Oil,	4 fl.ounces.
Chalk, in powder,	4 ounces av.
Liquor Subacetate of Lead,	$\frac{1}{2}$ ounce av.
Distilled Vinegar (or <i>Dilute Acetic Acid</i>),	4 fl.ounces.

Melt the Lead Plaster in the Oil, sift in the Chalk, then add the Liquor and Vinegar, and stir together until cold.

This is a cooling dressing for sores and ulcers.

389. Rose Cerate, or Lip Salve.

Oil of Almonds,	8 fl.ounces.
White Wax,	4 ounces av.
Alkanet Root,	½ ounce av.

Digest the Alkanet in the Almond Oil for some days, then filter or strain, add the Wax, melt and perfume while cooling with Otto of Roses, 30 drops, or other suitable perfuming oil a sufficient quantity. This makes a nice lip salve. Other formulas will be found among the Toilet Preparations.

Of other Cerates that are sometimes called for or prescribed, many will be found among the ointments of corresponding names. A few not thus classified are of sufficient importance to deserve mention here.

390. Ammoniacal Cerate.—Carbonate of Ammonium 1 drachm, Simple Cerate 1 ounce. Used as a counter-irritant in croup, etc.

391. Arsenical Cerate.—Arsenious Acid in fine powder 20 grains, Simple Cerate 1 ounce. Applied to cancerous sores, etc.

392. Cacao Cerate.—Butter of Cacao, Oil of Sweet Almonds, and White Wax, each equal parts, melted together. For chaps, etc.

393. Chalk Cerate.—Chalk in fine powder 1 ounce, Simple Cerate 3 ounces, Almond Oil 1½ ounces. Mix.

394. Copaiba Cerate.—Add 1 ounce of Balsam Copaiba to 8 ounces of Spermaceti Cerate, previously melted. A stimulating application.

395. Marshall's Cerate.—Palm Oil 2 ounces, Calomel 2 ounces, Acetate of Lead in fine powder 1 ounce, Nitrate of Mercury Ointment 4 ounces; rub them together. This is applied to the eyes.

396. Pitch Cerate.—Yellow Wax 8 ounces, Suet 4 ounces, Burgundy Pitch 6 ounces. Melt them together.

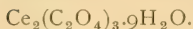
397. Verdigris Cerate.—Wax and Resin each 5 ounces, Venice Turpentine 5 ounces, Linseed Oil 2 ounces, Verdigris 1 ounce. Melt and mix them together. This is sometimes called *Green Cerate*. *Red Cerate* is made by adding 1 drachm of Vermilion to 1 ounce of Cerate.

CERIUM.

Symbol, Ce; Atomic weight, 140; Sp. gr. 6.62.

Cerium is a metallic element found in the mineral cerite. It is of a chocolate-brown color, and is classed chemically, with aluminium, cadmium and zinc. It unites with acids to form salts, the oxalate only being official.

398.

Cerii Oxalas.*Oxalate of Cerium.*

The powdered mineral cerite, which consists of silicates of several metals is treated with strong sulphuric acid or hydrochloric acid, by the aid of heat, to separate the silica. Ammonia is then added to the filtered diluted solution, and the precipitated hydrates are again treated with acids to separate other metals. The Cerium compounds are then precipitated by oxalic acid, the precipitate consisting of oxalates of Cerium, lanthanum and didymium, the latter metals are then separated with difficulty, leaving the Oxalate of Cerium.

Uses.—This salt is considerably prescribed in the nausea and vomiting of pregnancy, in doses of 2 to 10 grains.

Other Salts of Cerium.

The Oxalate of Cerium is the only Cerium salt of importance in pharmacy, the following, however, may be mentioned :

399. Chloride of Cerium— CeCl_2 .—Made by burning Cerium in chlorine gas and collecting the mass.

400. Nitrate of Cerium— $\text{CeNO}_3 \cdot 2\text{H}_2\text{O}$.—This may be made by dissolving ceroso-ceric oxide by nitric acid in the presence of alcohol.

401. Oxides of Cerium.—When Cerium is burned in the atmosphere, or with oxygen it forms oxides, as follows, under varying conditions: *Cerous Oxide* Ce_2O_3 , *Ceric Oxide* CeO_2 . By igniting Oxalate of Cerium in an open vessel *Ceroso-Ceric Oxide* Ce_3O_4 is formed.

402. Sulphate of Cerium— $\text{Ce}_2(\text{SO}_4)_3$.—By dissolving Oxide of Cerium in sulphuric acid, evaporating and crystallizing.

403. CETACEUM — SPERMACETI.

Spermaceti is a “peculiar concrete, fatty substance,” obtained from the oleaginous matter found in the head of the sperm whale, *Physcter macrocephalus*. The oily matter from which Spermaceti is obtained is found in a large cavity

in the upper jaw, and is dipped out soon after the animal is dead, as an oily liquid which congeals into a yellow mass. This is drained in suitable bags, and then pressed with great force, to remove the liquid olein, leaving the solid *cerin* in the bags. This is then purified by melting in water, straining, boiling with weak solution of potash, then washing with water, and is finally allowed to congeal into a white crystalline mass, somewhat resembling wax. Its low, melting point, 50°C . (122°F .), combined with its solidity when cold, makes it a valuable addition to many ointments and cerates, giving them a firm consistence, but allowing them to be readily worked or softened.

Uses.—Spermaceti is employed in pharmacy to give consistence to ointments, etc., and as an ingredient in several toilet preparations, *Crèmes*, etc. It is also used to give a gloss to starch. In medicine it is frequently given to allay internal irritation. It may be powdered by fusing it and rubbing it in a mortar until cold. Mixed with three times its weight of sugar it is the *Saccharated Spermaceti* considerable prescribed in France and Germany.

CHARTÆ — PAPERS.

In pharmacy a few medicinally prepared papers for various purposes are known, of which three are official in the U. S. P., and two in the new Br. P. They may readily be prepared by druggists. The following are the official *papers*:

404. Charta Cantharides, U. S.

Cantharides Paper.

White Wax,	4	ounces av.
Spermaceti,	1 ½	ounces av.
Olive Oil,	2	fl.ounces.
Canada Turpentine (Balsam Fir),	½	ounce av.
Cantharides in No. 40 powder, .	½	ounce av.
Water,	5	fl.ounces.

Mix all the substances in a tinned vessel and boil gently for two hours, constantly stirring; strain through a woollen

strainer without expressing, and; by means of a water-bath, keep the mixture in a liquid state in a shallow, flat-bottomed vessel with an extended surface. Coat strips of sized paper with the melted plaster, on one side only, by passing them successively over the surface of the liquid. When dry cut the stripes into rectangular pieces.

Uses.—This is used for producing blisters, and is first to be rubbed over with a little oil of turpentine or alcohol and then applied.

405. Charta Epispastica. Br.

Blistering Paper.

White Wax,	4	ounces av.
Spermaceti,	1 ½	ounces av.
Olive Oil,	2	fl.ounces.
Resin,	¾	ounce av.
Canada Balsam,	¼	ounce av.
Cantharides in powder,	1	ounce av.
Distilled Water,	6	fl.ounces.

The directions for making are essentially the same as the preceding. It contains double the quantity of cantharides.

406. Charta Potassii Nitratis, U. S.

Nitrate of Potassium Paper.

Nitrate of Potassium,	2	ounces.
Distilled Water	8	ounces.

“Dissolve the Nitrate of Potassium in the Distilled Water; immerse stripes of white unsized paper in the solution and dry them.”

Coarse straw paper is better than white paper for this purpose.

Uses.—This is chiefly used for asthma, or to sprinkle asthmatic remedies upon and ignite, that their smoke or vapor may be inhaled.

407.

Charta Sinapis.*Mustard Paper.*

The following is the U. S. 1880 formula, adapted to water-bath percolation:

Black Mustard, in No. 60 powder,	} each a sufficient quantity.
Benzin,	
Solution of Gutta-Percha,	

Pack the Mustard firmly in the water-bath percolator and gradually pour Benzin upon it; pour hot water in the water-bath surrounding the percolator, and percolate with the Benzin until the percolate ceases to produce a permanent greasy stain upon blotting paper. (This operation is for the purpose of removing the fixed oil from the Mustard.) Remove the powder from the percolator and dry it by exposure to the air. Then mix with it sufficient Solution of Gutta-Percha to give it a semi-liquid consistence, and apply with a brush to one side of heavy, well-sized paper, and allow to dry. Each square inch of the paper should contain about 6 grains of Mustard. The Br. formula is similar to the U. S., 1870.

Mustard in powder, 1 ounce av.
Solution of Gutta-Percha, about, . . . 2 fl.ounces.

Mix the Mustard with the Gutta-Percha solution so as to form a semi-fluid mixture, and having poured this into a shallow-vessel pass strips of cartridge-paper over its surface, so that one side of the paper shall receive a thin coating of the mixture.

Uses.—Mustard Paper is much used as a counter-irritant in neuralgia and many other diseases. Before applying it should first be immersed in warm water for about 15 seconds.

Other Papers.

Besides the foregoing official papers which are employed in medicine, others are known and sometimes used for applications and other purposes. A variety of papers are also made for various purposes, useful in pharmacy as test papers, parchment paper for dialysing, filtering paper, carbon paper

for duplicating, etc. The more important papers are as follows:

408. Antiasthmatic Paper.—Unsized gray filtering paper, 6 ounces; nitrate of potassium in fine powder, 3 ounces; belladonna, stramonium, digitalis, lobelia, and water-fennel, all in fine powder, $\frac{1}{4}$ ounce each; myrrh and olibanum in powder, $\frac{1}{2}$ ounce each. Tear up the filtering paper, and soak in water until soft; press out the water and beat the mass into a pulp, with which incorporate the powders; put into suitable moulds and dry. This may be moulded similar to pastils, which see.

409. Antirheumatic Paper.—Euphorbium, 1 ounce; cantharides, $\frac{1}{2}$ ounce; alcohol, 5 ounces. Macerate for one week, filter and add resin, 2 ounces; turpentine (gum), $1\frac{3}{4}$ ounces. This makes a varnish, which is to be brushed over thin paper.

410. Gout Paper—*Papier Fayard*.—Euphorbium, 1 part; cantharides, 2 parts, both in fine powder; are digested with alcohol, 8 parts; ether, 3 parts, in a stoppered bottle for a week, with frequent agitation. The tincture is then strained or filtered, one part of Venice turpentine added, and thin, white paper dipped in the solution. This is considerably used as a counter-irritant for rheumatism, neuralgia, gout, etc.

411. Copying Paper.—Thin, strong, soft paper is prepared in various ways for duplicating writing with a pencil or style. *Black* is the color most commonly used, but other colors are employed for tracing patterns, etc. The black copying paper is known in the market as *carbon paper*, and is made by mixing lampblack with lard, palm oil, or, preferably, with petrolatum, and rubbing the paper thoroughly over with the mixture, then, after standing a few hours, rubbing off the superfluous grease with a flannel rag. The operation should be conducted in a warm room, so that the pigment will be absorbed by the paper, and when rubbed off it will retain only enough for the purpose of copying, and not clog the paper being used for the writing. By placing alternate sheets of paper and copying paper, several duplicates may be obtained with one writing. This is called “Manifold” writing. Other colors may be made in the same manner, by using other pigments, as vermilion or other reds for *red*; umber or other browns for *brown*; chrome green for *green*; chrome yellow for *yellow*, etc. For tracing patterns, heavier paper is generally used.

412. Fly Paper.—Two kinds of papers for destroying flies are found on the market—the poison and the sticky fly papers. They are generally proprietary, but can readily be made by druggists, and afford a large profit.

Poison Fly Paper.—This is prepared by dipping coarse paper, made from woolen rags, into some kind of poison solution, and drying by hanging on lines. The poison solution may be made as follows:

White Arsenic (Arsenious Acid),	4 pounds av.
Concentrated Lye,	1 pound av.
Water,	10 gallons.

Dissolve the Concentrated Lye or caustic soda in the water and boil the solution, gradually adding the Arsenic, and continuing to boil until it is dissolved, then while still warm dip the paper in it, and hang on lines to dry. The paper thus prepared is cut into small sheets, put in saucers or plates, and water poured upon them, which dissolves the Arsenic. The flies drink of the water and die.

Other substances may be used for making the solution, as tartar emetic, corrosive sublimate, etc.; but the Arsenic is probably the best and cheapest.

Sticky Fly Paper.—This is a very popular paper for destroying flies, because it holds them, and they do not drop around and into things, as is the case when poison paper is used. It may be made in a variety of ways; but the best and cheapest is made as follows :

Resin,	2 pounds.
Cotton Seed or "Salad" Oil, about,	8 ounces.

Melt the Resin, and add to it half a pint of the oil. Owing to the difference in Resin more or less oil may be required; the object is to have it, when spread upon paper, sticky enough to hold the flies, yet not stiff enough so but when the paper is folded it may readily be pulled apart without tearing. A little may be spread upon paper and tested, then more oil or Resin may be added if necessary. This is spread, while warm, with a brush, spatula, muller, or other convenient utensil, upon sheets of firm, sized, white, or manilla paper, leaving a margin unspread, the paper is then folded together, and pulled apart when wanted for use.

413. Oiled Paper.—This is used in pharmacy for doing up packages of chemicals or other substances which are affected by moisture or air; also for capping bottles, jars, etc. It may be made by brushing sheets of paper of any desired thickness with boiled linseed oil, and drying them on a line. Oiled card board is used in copying-books for copying letters.

414. Parchment Paper.—Used in pharmacy for dialysing and for covering jars, capping bottle tops, etc. It is prepared from strong, white, unsized paper by dipping it for half a minute in strong sulphuric acid, diluted with a quarter of its measure of water, and then, after standing a few moments, into water containing a small quantity of ammonia.

415. Test Papers.—Various kinds of test papers are used in pharmacy—the most used and best known being blue and red litmus paper, for detecting the presence of acids or alkalies.

Blue Litmus Paper is made by dipping strips of filter-paper into an infusion of Litmus, made as follows: Triturate 1 ounce of Litmus in a mortar with 4 ounces of boiling water; pour off the liquid and add more boiling water in two or three portions until half a pint of the solution altogether is obtained. When cold, filter the solution and divide the filtrate into two equal portions; into one of these add with a glass rod a very small quantity of

sulphuric acid until it begins to be very slightly red; then mix the two portions again and dip the paper in them as directed.

Blue litmus paper is a delicate test for acids, which turn it red.

Red Litmus Paper.—To the solution of blue litmus prepared as above add sulphuric acid gradually by dipping a glass rod in it and then in the solution of litmus until it has a distinctly red color. Dip strips of filtering paper into this solution and dry.

Red litmus paper is a delicate test for alkalies, which turn it blue.

Tumeric Paper.—This is a yellow paper, sometimes directed to be used as a test for alkalies, which turn it brown. It is also turned brown by boric acid and soluble borates. It is made by boiling 2 ounces of tumeric in one pint of water, and dipping strips of paper in the decoction.

416. Tracing Paper.—For tracing drawings, designs, patterns, etc., thin, unsized white paper is made semi-transparent by applying to it with a brush a varnish made with equal parts of Canada Balsam and Oil of Turpentine, and drying by hanging on a line. It may also be made by applying a mixture of equal parts of Cotton Seed Oil and Oil of Turpentine; but the excess of oil must be absorbed by rubbing it over as soon as applied with flour or starch. The latter is more flexible than the former, but not so transparent.

417. Waxed or Paraffin Paper.—This may be made in a small way by dipping sheets of thin paper into a vessel of melted paraffin, and afterwards ironing them over with a hot flat-iron. Commercially, it is made by passing paper through rollers heated by steam and fed with melted paraffin. This paper is useful in pharmacy for covering over ointments, etc., and wrapping around packages of camphor ice, cosmetics, etc., to prevent them greasing the packages in which they are contained. It is much used by grocers to cover packages of lard, butter, or other greasy substances.

Besides the foregoing "papers," which may readily be made by druggists, *Filtering Paper* is an essential in pharmacy. It is made only by manufacturers who make a business of it. The best Swedish filtering paper is made of pure flax fibres, very finely crushed and broken; the white English papers have some cotton mixed with the flax; while the common gray circular papers of French, Dutch, and English manufacture, contain considerable wool, jute, and esparto grass, making them more porous and rapid filters than the other varieties, but not suited for fine chemical work.

CHEMICALS.

As known in pharmacy, "Chemicals" are products of the laboratory, or natural substances, having definite molecular

composition and characteristics by which they may be known and recognized. They differ from "Pharmaceuticals," in thus having a definite chemical composition, while the latter are merely mixtures or compounds of substances without definite chemical proportion.

Chemicals, as they are thus understood, include the metals and non-metals, the acids, the alkalies, and the alkaloids, together with the salts, which are produced by combining them. They are mostly made by manufacturing chemists, although many of them may readily be prepared by druggists. In this work the principal chemicals are noticed under the classes to which they properly belong, as ACIDA, ALKALOIDES, etc., or the elementary substances which form the bases of the compounds, as ARSENICUM, BISMUTHUM, etc.

For more complete description and classification of chemicals, the reader is referred to FENNER'S PRACTICAL CHEMISTRY, or other standard chemical text-books.

CHLORAL.



A peculiar oily liquid, obtained by the action of Chlorine on alcohol, first discovered and named by Liebig, is chemically known as Chloral.

Some confusion is liable to occur, because the 1880 U. S. P. has designated the substance known commercially as Hydrate of Chloral simply by the name "Chloral."

The following describes the process of making both Chloral and Hydrate of Chloral:

418. Chloral, U. S., Chloral Hydras, Br.

Hydrate of Chloral.



Chloral and Hydrate of Chloral are prepared by manufacturing chemists, by passing dry chlorine gas for several weeks

into absolute alcohol contained in a suitable vessel, until it becomes a thick oily liquid of sp. gr. 1.502. At first the alcohol is cooled by surrounding the vessel with ice to prevent explosion, but when no more will be absorbed toward the end of the operation, it is heated to nearly the boiling point, 60°C. (140°F.) The liquid thus obtained is Chloral. To purify it, it is agitated with four times its bulk of concentrated sulphuric acid for several hours at a temperature of 60°C. (140°F.), most of the hydrochloric acid escaping. The Chloral then separates as an oily layer on the top, and is further purified by distilling over calcium carbonate. This is pure *Anhydrous Chloral*. To make *Hydrate of Chloral*, it is mixed in glass vessels with the required quantity of water, and allowed to solidify into a cake, or "crust." This may be further purified by dissolving it in chloroform, benzin, or ethylen chloride, and crystallizing, and it is mostly used at present in this form. Chemically, Chloral is an aldehyd derivative, known as *trichloraldehyd*.

Uses.—Chloral is a hypnotic, used in delirium, nervous irritability, etc. The dose is from 10 to 30 grains, usually given in flavored syrup as syrup of ginger or orange.

419. Camphor-Chloral.

When Hydrate of Chloral and Camphor in nearly equal quantities are rubbed together in a mortar, the two solids unite and form a syrupy liquid, which is often employed for tooth-ache, facial neuralgia, and other painful affections. It may be made as follows :

Camphor,	5 parts or drachms.
Hydrate of Chloral,	4 parts or drachms.

Rub the Camphor, by the aid of a few drops of alcohol, to a powder, and add the Chloral, rubbing them together until they become liquid.

This may be diluted if desired by mixing it with alcohol and glycerin equal parts. When thus prepared it may be used as an anodyne application or liniment, or may be given internally.

CHLORINE.

Symbol, Cl.; Atomic weight, 35.4.

Chlorine is a gaseous element of greenish-yellow color and suffocating odor. Its specific gravity is 2.45. It was discovered by Scheele in 1774, and was, later on, classed with the elements, and named, from its color, by Davy.

Chlorine combines with every other element except fluorine, and is therefore of great interest and importance. It possesses wonderful bleaching properties, and is largely used in the arts for this purpose. It is also a powerful disinfectant. Its compounds with the alkali metals are of great industrial value and application, and its salts form a large class of chemicals useful in pharmacy and medicine. It combines with other elements forming *chlorides*, and in combination with oxacids unites with bases, forming *chlorates* and *perchlorates*.

Chlorine may be obtained by heating hydrochloric acid with peroxide of manganese in a flask and collecting the gas; but is prepared commercially in apparatus specially constructed for the purpose.

The only preparation in which Chlorine is exhibited in a free state is in Chlorine water, which was formerly official in the U. S. P., and is now official in the Br. P. under the title

420. **Liquor-Chlori, or Aqua-Chlori.**

Solution of Chlorine, Chlorine Water.

The British formula is as follows:

Hydrochloric Acid,	6 fl.ounces.
Black Oxide of Manganese,	1 ounce av.
Distilled Water,	34 fl.ounces.

Put the Oxide of Manganese into a gas bottle, and having poured upon it the hydrochloric acid diluted with two ounces of the water, apply heat gently, and by suitable tubes cause the gas developed to pass through two ounces of the water

placed in an intermediate small phial, and thence to the bottom of a three-pint (60-ounce) bottle, containing the remainder of the water, etc. When the gas has all been generated, shake the bottle that the gas may be absorbed by the water.

Uses.—Chlorine Water is employed as an antiseptic wash and gargle, especially for diphtheria and ulcerated sore throat. It is also given internally in fevers and other septic disorders, in doses of from 10 to 30 minims, largely diluted with water.

Acids of Chlorine.

421. Hypochlorous Acids — HClO — may be made by agitating chlorine water with red precipitate, and distilling the liquid, to separate the solution of the gas from the Chloride of Mercury, which results from the reaction.

422. Chlorous Acid — HClO_2 . — Made by heating together in a glass flask in a water-bath Chlorate of Potassium 4 parts, Arsenic 3 parts, Nitric Acid 12 parts, Water 4 parts. The gas generated by the operation is conducted by a bent tube into a receiver, containing water. It is a great bleaching and oxidizing agent.

423. Chloric Acid — HClO_3 . — This may be made by decomposing Chlorate of Barium with an equivalent quantity of pure diluted sulphuric acid, and evaporating the liquid poured off from the precipitate, *in vacuo*, over strong sulphuric acid. Although this is the acid basis of the *Chlorates*, it is seldom used in pharmacy.

424. Hydrochloric Acid — HCl . — This is the only compound of hydrogen and Chlorine known. It was formerly called *Muriatic Acid*. It is obtained chiefly as a by-product in the manufacture of soda-ash from common salt by heating to a high temperature with sulphuric acid, by which process sulphate of sodium is formed, and hydrochloric acid liberated in the form of gas; this is then purified and dissolved in water by various methods, forming the Hydrochloric Acid of Commerce, which contains 31.9 per cent. of the gaseous acid. It is frequently called for as *Spirit of Salt* or *Oil of Salt*. It is the acid basis of the *Chlorides*, and is much used in pharmacy and the arts. See page 60.

425. Perchloric Acid — HClO_4 . — By distilling pure dry Perchlorate of Potassium with four times its weight of boiled, concentrated sulphuric acid and collecting the distillate.

Besides the combinations of hydrogen and oxygen with chlorine, it forms compounds with some other acids, as *Chlorochromic Acid*, CrOCl , *Chlorocarbonic Acid*, COCl_2 , etc., and with elements as *Chloride of Bromine*, etc.

426. CHLOROFORM — CHLOROFORM.



Chloroform is a derivative of aldehyd, known chemically as *trichlormethane*. Several methods of preparing it are employed by manufacturing chemists, the most familiar being by the action of chlorinated lime on alcohol. A recent process is now employed, commercially, by which wood or sawdust is decomposed at a high temperature, and chloroform prepared from the crude acetates obtained at a much lower cost of production.

The uses of Chloroform as an anæsthetic, narcotic and sedative are well known. It is employed internally as a sedative and narcotic, in doses of from 1 to 10 minims, largely diluted; and externally as a counter-irritant and sedative in liniments, and applications for neuralgia, pain, etc.

The U. S. P. recognizes two preparations of Chloroform, namely, Purified Chloroform and Commercial Chloroform. The Br. P. mentions only Chloroform, which corresponds with the U. S. Purified Chloroform. Commercial Chloroform should only be used externally. Purified Chloroform may be used externally, internally, or by inhalation, and is now quite generally used by druggists for all purposes.

As the processes for making Chloroform are somewhat complicated, and it is seldom made except by manufacturing chemists, they are not here repeated.

Chloroform should have a specific gravity of about 1.490. It is soluble in about 200 parts of water, and in all proportions in ether and alcohol. It is not inflammable like ether. Preparations containing Chloroform will be found under their appropriate headings.

427. CHOCOLATA.

Chocolate and Cocoa.

Chocolate is prepared from the roasted seeds of *Theobroma Cacao*, deprived of their husks or "shell." Its manufacture in

this country, although confined to only a few establishments, constitutes an important industry.

To prepare Chocolate, the seeds, which are somewhat like small acorns, are roasted, then decorticated, or deprived of their covering or husks. The kernel is then ground in a mill, and made into a paste with heated metal rollers. It is then run into cakes. Chocolate, as thus prepared, contains considerable fatty matter, known as *Oleum Theobromæ*, or Butter of Cacao. By mixing it with warm water, most of the oil rises to the top and is removed. The precipitate is collected, dried, and variously prepared, and is known on the market as COCOA.

Chocolate and Cocoa are extensively used as nutritive drinks, for which they are more esteemed than tea and coffee. In confectionery vast quantities are used, chocolate confectionery being the universal favorite. In pharmacy Chocolate is frequently used in confections, for covering the taste of disagreeable medicines, and sometimes in making simple elixir to which it gives an agreeable flavor. It is extensively used, made into a syrup for the soda fountain.

A variety of proprietary tablets, containing Chocolate as a base, have formerly been put upon the market, but as they are liable to become wormy or spoil, they have mostly been withdrawn.

It is quite a common error to suppose that Chocolate and Cocoa are prepared from the well-known Cocomut, the fruit of *Cocos Nucifera*, instead of the small acorn-like nuts or fruit of *Theobroma Cacao*.

CHROMIUM.

Symbol, Cr.; Atomic weight, 52.4.

The element Chromium is a very hard, brittle, grayish-white metal. It was discovered by Vauquelin in 1797, and is obtained by igniting its oxide with charcoal at an intense heat. It occurs in nature in the form of ore combined with iron (chrome-iron ore) with lead and some other metals.

Some of its salts are extensively used in dyeing, and two or

three of them in pharmacy and medicine. Chromic Acid or Anhydride and Bichromate of Potassium are the only preparations of Chromium, which are used to any extent in medicine. The latter is noticed with the potassium salts.

428. Acidum Chromicum.

Chromic Anhydride—Chromic Acid.



With oxygen Chromium forms five compounds, namely, Chromous oxide, CrO , Chromium dioxide, CrO_2 , *Chromium trioxide*, CrO_3 , Chromic oxide, Cr_2O_3 , trichromic tetroxide, Cr_3O_4 .

The Trioxide of Chromium is the official chromic anhydride, or, as it is more commonly known, Chromic Acid. It is prepared according to the 1885 Br. P. as follows:

Bichromate of Potassium,	. . . .	30 ounces av.
Sulphuric Acid (Imp. measure),	. .	57 fl.ounces.
Distilled Water, a sufficiency.		

Dissolve the Bichromate of Potassium in a mixture of 50 fl.ounces of water and 42 fl.ounces of the acid, set aside for 12 hours, and decant the liquor from the crystals of acid sulphate of potassium that have separated. Heat the liquor to about 185°F. (85°C.), and add the remainder of the acid and water sufficient to just redissolve any crystals of chromic acid that may have formed. Allow to cool, collect and drain the crystals, and dry them on porous tiles at a temperature not exceeding 100°F. in an air-bath. From the mother liquor more crystals may be obtained on evaporation.

Uses.—Chromic Acid is a caustic and antiseptic, and is used for removing warts and other morbid growths. It is not given internally. Some other Chromium Compounds are known and sometimes used, as *Bromide of Chromium*, Cr_2Br_6 , *Dichloride of Chromium*, CrCl_2 , *Fluoride of Chromium*, Cr_2F_6 , *Iodide of Chromium*, CrI_6 , *Sulphate of Chromium*, $\text{Cr}_2(\text{SO}_4)_3$, but they are usually furnished by chemists when wanted.

COBALTUM — COBALT.

Symbol, Co; Atomic weight, 58.9; sp. gr. 8.5.

An elementary metal, classed chemically with nickel and tin, and usually found in nickel and arsenical ores. It is a tough, brittle, white metal when pure; but the "Cobalt" which is sold in the stores as *Flystone* is a native ore, containing arsenic, CoAs_3 , and owes its value as a fly poison to the arsenic it contains.

The black Oxide of Cobalt is much employed in the arts, especially as a basis of fine pigments, as its salts produce rich colors. The acetate, chloride, nitrate and sulphate of Cobalt are used for making *sympathetic inks*, which are invisible on the paper, but may be developed by moisture, heat, etc.

Barometer Paper is made by dipping white paper in a solution of Chloride of Cobalt. When dry the color is blue, but increased moisture in the atmosphere changes the color to pink.

The Salts of Cobalt are not employed in medicine, and are seldom used in pharmacy, except as above noted. They may be made in a general way by dissolving the oxide or carbonate of Cobalt in acids, and crystallizing or precipitating.

COLLODIA — COLLODIONS.

Collodions are liquid preparations made by dissolving pyroxylin or gun-cotton in a mixture of ether and alcohol, and adding other substances if desired. Their value consists chiefly in forming a coating upon the surface to which they are applied, which is utilized in the arts for various purposes, and in medicine for the application of medicinal substances, or the protection of the parts to which they are applied.

The volatile liquids which are contained in Collodions rapidly

evaporate when exposed to the air or applied to a surface, leaving a thin flexible covering or skin.

The following are the official Collodions ;

429. Collodium.

Collodion.

Pyroxylin, or Gun-Cotton,	$\frac{1}{2}$ ounce av.
Stronger Ether,	11 $\frac{5}{8}$ fl.ounces.
Alcohol,	3 $\frac{7}{8}$ fl.ounces.

Add the Alcohol to the Pyroxylin in a bottle and let stand for 15 minutes, then add the Ether, and shake the mixture occasionally for several days until the Pyroxylin is dissolved, set aside, and when all sediment has subsided decant the clear portion and keep in tightly stopped bottles away from light or fire.

This is substantially the U. S. 1880 formula. The Br. formula is Pyroxylin $\frac{1}{2}$ ounce, Ether 18 fl.ounces, Rectified Spirit 6 fl.ounces, making a preparation containing only about two thirds as much gun-cotton as the former.

Uses.— In the arts Collodion has been extensively employed in photography. In pharmacy, it is used as a basis for making several preparations, and in surgery, it is considerably used as a dressing for wounds, bruises, etc., forming a false membrane or skin over the surface. It is an ingredient of most of the popular corn cures, chiefly on account of its convenience of application.

430. Collodium cum Cantharide, U. S.

Collodion with Cantharides, Cantharidal Collodion.

The U. S. P., 1880, directs this to be made by percolating 60 parts of powdered Cantharides with commercial Chloroform until 250 parts of tincture are obtained, then to recover by distillation 200 parts of the Chloroform, evaporate the residue to 15 parts, and dissolve in 85 parts of flexible collodion to make 100 parts.

The following formula is essentially the same, and is to be preferred, as it makes a stronger and better preparation :

MADE BY WATER-BATH PERCOLATION.

Cantharides (in fine powder),	8	ounces av.
Pyroxylin,	$\frac{1}{2}$	ounce av.
Canada Turpentine (Balsam Fir), . .	320	grains.
Castor Oil,	160	grains.
Stronger Ether,	11 $\frac{5}{8}$	fl.ounces.
Alcohol,	3 $\frac{7}{8}$	fl.ounces.
Commercial Chloroform, a sufficient quantity.		

Pack the Cantharides firmly in the water-bath percolator, and pour upon it a pint of Chloroform, adjusting the cover tightly on the percolator. Pour water heated to about 150 degrees in the water-bath which surrounds the percolator, and keep at a moderate heat for half an hour; then remove from the fire and begin to percolate, adding Chloroform to the drug in the percolator, and continuing the percolation until the Cantharides is exhausted, or until about 20 fl.ounces have passed. Distill off the Chloroform until only 2 ounces of the extract remains. When cool, add to this extract the other ingredients which have previously been made into Flexible Collodion, by mixing them together, as directed for making Collodion and Flexible Collodion, and, after standing without agitation for 48 hours, pour off from any sediment that may have subsided.

The Chloroform remaining in the drug after percolation may be recovered by adjusting the still top and distilling as directed.

The corresponding British preparation is as follows :

COLLODIUM VESICANS.

Blistering Collodion.

Blistering Liquid (Imp. measure), . .	20	fl.ounces.
Pyroxylin,	1	ounce av.

Add the Pyroxylin to the liquid in a stoppered bottle, and shake them together until the former is dissolved. The

blistering liquid directed to be used is the *Liquor Epispasticus* of the Br. P., made from Cantharides and acetic ether.

Uses.—Cantharidal Collodion is only used externally for blistering. It is best applied to the parts with a camel's-hair pencil.

431. Collodium Flexible.

Flexible Collodion.

Collodion,	92 parts or 1 ounce av.
Canada Turpentine,	5 parts or 24 grains.
Castor Oil,	3 parts or 14 grains.

Mix. As its name indicates, this is elastic or flexible.

432. Collodium Stypticum.

Styptic Collodion — Styptic Colloid.

Tannic Acid,	4 parts or 160 grains.
Alcohol,	1 part or 52 minims.
Stronger Ether,	4 parts or 220 minims.
Collodion,	55 parts or 1½ fl.ounces.

Put the Tannic Acid in a bottle, add the Alcohol, Ether and Collodion, and agitate until dissolved.

Uses.—As its name indicates, this is used as an astringent and styptic.

The following unofficial Collodions are sometimes called for :

433. Antiseptic, Styptic Collodion.

Tannic Acid,	120 grains.
Benzoic Acid	120 grains.
Carbolic Acid,	240 grains.
Collodion,	6 fl.ounces.

Mix and dissolve. This is sometimes called *Hemostatic Collodion*.

434. Iodinal Collodion.

Iodine,	120 grains.
Canada Turpentine,	2 fl.drachms.
Collodion,	8 fl.ounces.

Or

Iodine,	15 grains.
Flexible Collodion,	1 fl.ounce.

The former formula was originally published by J. T. Shinn. It is used as an absorbent application.

435. Iodoform Collodion.

Iodoform,	30 grains.
Balsam of Peru,	30 grains.
Green Soap,	30 grains.
Flexible Collodion, sufficient quantity to make	480 grains.

Mix. An antiseptic dressing for ulcers, sores, etc.

436. Liebig's Corn Collodion.

German Corn Cure.

The following formula has been extensively published and used as a corn remedy, its chief advantage being its convenience of application :

Salicylic Acid,	10 grains.
Extract of Indian Hemp,	60 grains.
Collodion,	10 fl.drachms.

Mix and dissolve.

437. Styptic Colloid.

Chloride of Iron (the Salt),	60 grains.
Collodion,	1 fl.ounce.

Dissolve the Iron Salt in the Collodion. This is an excellent styptic for checking the flow of blood, and for erysipelas, etc.

Besides the foregoing Collodions, there are a great variety which apply particularly to photography, the formulæ for which appear in books and journals upon that subject. Some other medicinal Collodions are also made : such as Aconite Collodion, Belladonna Collodion, Morphine Collodion, etc., but they are prepared by mixing alcoholic fluid extracts of the drugs with Collodion, and do not require special formulas.

COLORES — COLORS.

In pharmacy a variety of preparations are made for coloring various medicinal and toilet preparations, juices, solutions, syrups, extracts, powders, etc. They are very properly divided

into several classes, which will be considered in the order of their importance in pharmacy. Many of the substances from which they are made will be noticed under other headings, as *Anilina*, *Tinctoria*, etc.

Coloring Liquids.

These are designed for coloring medicinal preparations, solutions, juices, syrups, extracts, spirits, liquors, cordials, elixirs, and all liquids in which it is necessary to use a harmless coloring ingredient. They must, as a rule, make clear, transparent preparations when combined with aqueous solutions, or with spirits containing 50 per cent. of alcohol.

438. Caramel.

Solution of Caramel, Burnt Sugar Coloring. (Brown.)

Sugar, any convenient quantity.

Water, a sufficient quantity.

Put the Sugar (without water) into an iron kettle of several times the capacity required for it, heat it to 410° to 430° F. as long as it gives off any vapor, and until it is changed to a black, viscid mass, stirring it occasionally during the operation, then cool, and while cooling add hot water in the proportion of one pint for each pound of the sugar used, let stand to dissolve, strain the solution, and concentrate it by evaporation to a syrupy consistence, or until it measures a pint for each pound of sugar used.

As ordinarily made, no precaution is taken to regulate the degree of heat, and for that reason a portion is converted into charcoal, which is insoluble. In small operations this is unimportant, but in manufacturing establishments the heat is regulated by an oil or sand-bath, or other means, to avoid this difficulty.

Uses.—Caramel is extensively used for coloring liquors, bottled beverages, and in soda-water syrups, etc. In pharmacy it is employed for coloring syrups, solutions, elixirs, wines, and other liquids, which are required to have an artificial brown

coloring. A reddish-brown is made by mixing caramel with red coloring.

Preparations containing more than 50 per cent. of alcohol precipitate this coloring, and it may be obtained pure in the form of a mass or powder by pouring it into strong alcohol, and afterwards washing the precipitate with alcohol.

439. Carmine Coloring.

Solution of Carmine. (Red.)

Carmine, No. 40,	120	grains.
Carbonate of Potassium (Salts of Tartar),	60	grains.
Glycerin,	2	fl.ounces.
Water of Ammonia,	$\frac{1}{2}$	fl.ounce.
Water,	5	fl.ounces.

Rub the Carmine with the Salts of Tartar to a fine powder, and then with the Glycerin, Water of Ammonia, and lastly with the Water, added in successive portions to rinse out the mortar. This is a strong red coloring, easily made, and will keep permanently.

Uses.—This solution may be used for coloring all neutral elixirs, solutions, tinctures, syrups, etc., which do not contain a large percentage of alcohol. It is precipitated by acids, and cannot therefore be employed for coloring acid syrups, etc. It makes a fine *Red* or *Carmine Ink*, and may be perfumed by diluting with an equal quantity of Orange Flower or Rose Water, and used as "*Liquid Rouge*." It may be used for giving a "flesh" tint to liquid face cosmetics, and may be mixed with face powders to give them the same.

440. Cochineal Red.

Cochineal,	1	pound av.
Carbonate of Sodium (Sal Soda),	1	ounce av.
Alcohol,	1	pint.
Water, sufficient to make 2 pints.		

Grind the Cochineal to a coarse powder, mix the alcohol with one pint of Water, and dissolve the Sal Soda in the mix-

ture, moisten the powder with the liquid, put in a water-bath percolator, pour upon it the remainder of the liquid, allow to stand 24 hours, heat moderately for one hour, then percolate, adding water to the drug after the liquid has disappeared from the surface, and continuing the percolation until $1\frac{3}{4}$ pints of the percolate have passed, which reserve, continue the percolation with water until a pint more has passed, which evaporate to 4 fl.ounces, and add to the reserved portion.

Uses.—This may be used the same as the Carmine solution for coloring all neutral elixirs, syrups, etc. When added to an acid preparation the color is very much weakened, and a precipitate eventually forms.

441. Cochineal Fruit Red.

Cochineal, 1 pound av.
 Cream of Tartar, 2 ounces av.
 Alcohol, 1 pint.
 Water, sufficient to make 2 pints.

Make in the same manner as No. 440.

Uses.—This coloring may be used with fruit juices or syrups, wines or other mildly acid preparations, and gives with them a bright red color. It may also be used with neutral liquids.

442. Cudbear Red.

Cudbear, 1 pound av.
 Alcohol, 1 pint.
 Water, sufficient to make 2 pints.

Percolate and proceed in the same manner as is directed for making Cochineal Red (440). This is also known as *Tinctura Persionis*.

Uses.—This makes an excellent red coloring, which may be used for all neutral and acid preparations. It is similar to most of the "Fruit Coloring" that is sold by dealers in soda-water supplies. Acids brighten but do not weaken its color; with alkalis it gives a purple color.

443. Grass-Green.

Fresh Lawn Grass, any convenient quantity.
 Alcohol, a sufficiency.

Cut the grass fine, put it in a wide-mouthed bottle, as compactly as possible, and cover it with alcohol, let stand a few days, with occasional agitation, and pour off the liquid, which will be a dark-green color. The *Chlorophyll* of the grass is dissolved by the alcohol.

Uses.— This is used for coloring bay rum, and some liquors and cordials. As it is only slightly soluble in water, it is not recommended for aqueous preparations, a solution of sap-green being used for these.

444. Lemon-Yellow.

For coloring Extract of Lemon or other spiritous solutions a natural lemon-yellow, chop the peel of lemons and cover them with alcohol, allow them to stand for a few weeks, then pour off the liquid.

445. Fustic-Yellow.

Ground Fustic Wood, 1 pound.
 Diluted Alcohol, a sufficient quantity.

Pack the Fustic in a percolator, pour sufficient diluted alcohol upon it to cover it, and after standing 24 hours percolate, adding enough diluted alcohol through the percolator to make two pints of the percolate.

Uses.— This may be used for imparting a yellow color to any preparation desired. For coloring Lemon Extract it is perhaps better to put the Fustic in the filter instead of using this.

446. Litmus Blue.

The method of making a solution of Litmus has already been described (415). This solution may be used for coloring neutral preparations, but is changed to red if acid is present.

447. Orange.

For coloring orange flavoring extract made from Oil of Orange or other spiritous solutions a true orange color, chop the peels of oranges and cover them with alcohol, allow them to stand for a few weeks, then pour off the liquid.

Saffron Orange may be made from Saffron in the same manner as 444, and is a fine coloring for many preparations.

Tumeric, with alcoholic solutions, makes a light orange color.

Annatto, or *Arnatto*, makes a reddish orange color in solutions.

448. Butter Color.

Many proprietary preparations have been extensively sold for coloring butter. The first put upon the market were solutions of the coloring principles of annatto or annatto in strong alkali. These had the disadvantages of being unpalatable and coloring the buttermilk, making it unfit for use, but are still used for coloring cheese. For coloring butter, Oil colors which combine with the butter only, and do not color the buttermilk, are now used entirely. The best Butter Color may be made from *Annattoine*, the coloring principle of Annatto, as follows:

Annattoine,	4 ounces av.
Salad Oil (Purified Cotton Seed Oil) sufficient to make	1 gallon.

Rub the Annattoine with a portion (say 1 pint) of the Salad Oil until it is a smooth mixture of uniform consistence. Grind the mixture very fine through a paint mill, or by continued rubbing in a mortar. Add it to the remainder of the Oil, and heat by water-bath, with occasional stirring, for 4 hours or longer; then, when cool, strain or filter through paper.

As thus prepared this is equal to any of the Butter Colors on the market, provided only the right materials be used in making it. The Annattoine must be free from adulteration, and the Salad Oil free from odor.

Colors for Powders, Etc.

For coloring tooth powders and pastes and face powders, Solution of Carmine may be most advantageously used by first rubbing a portion of the powder thoroughly with it to form a stiff mass, and then incorporating this by rubbing with the remainder of the powder. If powdered carmine is used instead of the solution, great care must be taken to have it finely powdered and thoroughly mixed with the other ingredients.

Other colors for powders are seldom required, but if they are, some harmless drug or pigment may be used, as charcoal or ivory black for *black*, tumeric for *yellow*, red saunders for a cheap *red*, etc.

Show Bottle Colors.

Colors for show bottles, to be satisfactory, must be bright, transparent, and permanent, able to stand the sunlight without precipitation and changes of temperature incident to the climate without freezing in winter or decomposing in summer. To meet all these requirements, solutions of mineral substances, containing a percentage of alcohol or acid sufficient to keep them, are generally best adapted. The aniline colors, although bright and beautiful, usually refract light, and are soon faded or decomposed by the action of sunlight.

The following hints will be serviceable in preparing show-bottle colors:

Use rain water or distilled water for making them, to avoid precipitates.

If in a cold climate use 15 to 25 per cent. of alcohol to avoid freezing; in a warm climate much less, or even none, is required in most of the colors.

Filtering properly is very important; do not be satisfied until your colors are perfectly transparent. They may require to be filtered once or twice a year, but their improved appearance well repays the cost.

Do not make the colors for the large globes too strong or dark; deeper colors can be used in the small globes.

The following colors are readily made, simple and inexpensive, and will be found satisfactory:

449. Amber, Lemon or Orange.

Any shade of yellow that may be desired, from a light amber or lemon to a deep orange, may be made by taking:

Chromic Acid, 5 to 60 grains.
Water, 1 gallon.

Dissolve and filter.

Bichromate of Potassium, which is usually used for making an amber color, deposits a coating of insoluble matter on the glass very difficult to remove, and soon renders the color dim. When Chromic Acid is used, this is avoided.

450. Blue.

Sulphate of Copper, Blue Vitriol, 2 pounds av.
Sulphuric Acid, 8 fl.ounces.
Warm Water sufficient to make a gallon.

Dissolve the Blue Vitriol in the Water, add the Acid and filter.

This makes a very *Deep Blue*; a *Medium Blue* may be made by diluting one half with water, a *Light Blue* by diluting with from 4 to 8 parts of water, according to shade desired. A fine Blue may also be made by dissolving Copper in Nitric Acid, and diluting with water.

451. Crimson.

Alkanet Root, 1 pound av.
Oil of Turpentine, 1 gallon.

Perecolate the Alkanet Root with the Oil of Turpentine.

This may be made any lighter shade of crimson by diluting with Oil of Turpentine. This will not, of course, mix with other colors.

452. Green.

Add to each gallon of Blue from 10 to 60 grains of Chromic Acid, according to shade of green desired. Any shade of Green from a deep Blue-Green to a rich Olive may be made by varying the quantity of Chromic Acid. For *Medium Green* dilute the Green thus made with an equal quantity of water; for *Light Green* dilute with from 4 to 8 parts of water, according to the shade desired.

453. Red or Scarlet.

Cudbear,	½ ounce av.
Nitric Acid,	4 fl.ounces.
Water,	1 gallon.

Mix, allow to stand 24 hours, and filter.

To make *Medium Red*, dilute with an equal quantity of water; to make *Light Red*, or *Pink*, dilute with 4 to 8 parts of water, as required to produce the desired tint.

454. Violet.

Cudbear,	60 grains.
Aqua Ammonia,	4 ounces.
Water enough to make 1 gallon.	

Mix, allow to stand 24 hours and filter. For lighter shades of violet dilute with water.

455. Wine Color.

Caramel Solution,	sufficient.
Water,	7 pints.
Alcohol,	1 pint.

Mix sufficient of the Caramel with the Water and Alcohol to make the desired color, and filter.

A wine color may also be made by dissolving a few grains of iodine in a pint of alcohol, and adding water sufficient to make a gallon, then a few drops of nitric acid until the right shade is produced.

The foregoing are the principal colors used in show bottles, but as many more as may be desired may be made by combining them. Some of the aniline colors make very fine effects, but are not so permanent as the preceding. If two or three colors are desired in one globe, amber, blue, or green may be used to partly fill the globe, and the crimson poured carefully upon it to fill. The turpentine color will remain permanently at the top.

Many other substances which are naturally colored may be used in show bottles, as fruit juices mixed with alcohol and water, oils of various kinds, either natural or colored, etc., but the foregoing are the cheapest and best.

Colored Fires.

Although the manufacture of colored fires may not properly be included in the practice of pharmacy, the druggist is frequently called upon to prepare them.

The following formulæ are designed for making fires suitable for theatrical illuminations, street parades, etc., which are the kinds usually required to be made by druggists. In the

manufacture of fire-works a great variety of colored fires are made, but their formulas are not important to the druggist.

In making colored fires it is necessary to observe some precaution in powdering and mixing the materials. The substances should be separately powdered, then mixed by means of a wooden spatula, and the mixture kept in tin cans away from moisture or heat. The sulphur directed is sometimes omitted from the formulæ on account of its disagreeable vapor, but it is not generally objectionable in the quantities used.

456. Blue Fire.

Dark Blue may be made by taking :

Sulphur,	1 ounce.
Burnt Alum,	1 ounce.
Carbonate of Copper,	1 ounce.
Chlorate of Potassium,	4 ounces.
Shellac,	1 ounce.

Powder the drugs fine and mix with the Shellac in moderately coarse powder.

Light Blue may be made by taking :

Sulphur,	1 ounce.
Burnt Alum,	2 ounces.
Chlorate of Potassium,	4 ounces.
Shellac,	1 ounce.

Mix the same as the preceding.

457. Green Fire.

Dark Green may be made by taking :

Nitrate of Barium,	4 ounces.
Boric Acid,	1 ounce.
Chlorate of Potassium,	3 ounces.
Sulphur,	1 ounce.
Shellac,	2 ounces.

Powder the drugs fine and mix with the Shellac in moderately coarse powder.

Light Green may be made by taking :

Carbonate of Barium,	2 ounces.
Sulphur,	1 ounce.
Chlorate of Potassium,	4 ounces.
Shellac,	2 ounces.

Mix as the preceding.

458. Red Fire.

Dark Red may be made by taking:

Nitrate of Strontium,	6 ounces.
Chlorate of Potassium,	2 ounces.
Sulphur,	1 ounce.
Shellac,	1 ounce.

Powder the drugs fine and mix with the Shellac in moderately coarse powder.

Light Red or *Pink* may be made by using only half the quantity of the Nitrate of Strontium, or as follows:

Chalk,	2 ounces.
Sulphur,	1 ounce.
Chlorate of Potassium,	3 ounces.
Charcoal,	$\frac{1}{4}$ ounce.
Nitrate of Potassium,	3 ounces.
Shellac,	1 ounce.

Powder and mix as the preceding.

459. Violet Fire.

Burnt Alum,	1 ounce.
Carbonate of Potassium,	1 ounce.
Sulphur,	1 ounce.
Chlorate of Potassium,	4 ounces.
Shellac,	1 ounce.

Powder the drugs fine and mix with the Shellac in moderately coarse powder.

460. White Fire.

Nitrate of Potassium,	8 ounces.
Charcoal,	$\frac{1}{4}$ ounce.
Sulphur,	1 ounce.
Shellac,	1 ounce.

Powder and mix as the preceding.

461. Yellow Fire.

Sulphur,	1 ounce.
Dried Carbonate of Sodium,	2 ounces.
Chlorate of Potassium,	5 ounces.
Shellac,	1 ounce.

Powder and mix as the preceding.

The foregoing are all the Colored Fires that are generally required for theatrical illuminations, street parades, etc., but a great variety of other colors

may be made by variously combining them, and many shades of color may be made by varying the quantities of the ingredients used.

Liquid Colored Fires or Flames.

These may be made by dissolving certain substances to saturation in Alcohol or other liquids which will dissolve them, and burn with rapidity. They are best ignited in a shallow iron pan, which for safety should be set in a shallow pan of water. Considerable caution is required in burning these liquids, that accidents may be prevented.

The substances used should be finely powdered and triturated with the Alcohol in a mortar.

Blue may be made by dissolving Acetate of Zinc in Alcohol; *Green*, by dissolving Boric Acid in Alcohol; *Red*, by dissolving Nitrate of Strontium in Alcohol, or by making a strong Tincture of Lycopodium; *Violet*, by dissolving Carbonate of Potassium in Alcohol; *Yellow*, by dissolving Nitrate of Sodium in Alcohol; *White*, by dissolving Camphor in Alcohol.

Another method of exhibiting Colored Fires, and perhaps the best of all, is to mix the finely powdered substances which produce the colors, as above, with a moderately thick Solution of Shellac in Alcohol. They are thus suspended, and when burned give forth their characteristic color.

CONFECTIONES — CONFECTIONS.

Confections are substances resembling soft, solid extracts, prepared by incorporating medicines with sugar or other saccharine matter and aromatics. They were once very popular, but are now little used. Similar preparations, varying somewhat in consistence and manner of making, were formerly known as *Electuaries* and *Conserves*, and as such they are still called for occasionally.

Confections and Conserves.

Of the Confections formerly official but two only were retained in the U. S. 1880 Pharmacopœia. The 1885 Br. P. retains eight.

Several popular proprietary articles, such as Fruit-Laxatives, etc., are Confections, put up in attractive form.

In French Pharmacy under the name *Conserves* a great variety of fresh leaves and petals of plants are made into mass by

beating or pounding with sugar, until they are thoroughly incorporated. The proportion of sugar used varies from double to three times the quantity, by weight, of the fresh leaves. The following formulæ are representative of the whole class :

462. **Conserve de Cochléaria.**

Confection of Scurvy Grass.

Scurvy Grass Leaves, fresh, 1 part.
Sugar, 3 parts.

Beat the two substances in a mortar until they are reduced to a pulpy mass, which should then be passed through a hair-cloth sieve by the aid of a flat-ended wooden spatula.

In French Pharmacy the leaves or flowers of several plants containing considerable water are made into Conserves in the same manner and with the same proportion of sugar as sorrel, fumitory, the cresses, peach and violet flowers, etc., are made into Confections in this manner.

Other Conserves of leaves which contain considerable moisture are made in the same proportion, but those containing less moisture are made as follows :

463. **Conserves de Laurier-Cerise.**

Confection of Cherry-Laurel Leaves.

Cherry-Laurel Leaves, fresh, 1 part.
Sugar, 2 parts.

Make in the same manner as the preceding.

A great variety of leaves and flowers are made into conserves in this proportion.

U. S. and Br. Official Confections.

The following are the confections official in the U. S. and Br. Pharmacopœias :

464. **Confectio Opii, Br.**

Confection of Opium.

Compound Powder of Opium, . . 100 grains or 1 part.
Syrup, 300 grains or 3 parts.

Mix. Dose, 5 to 20 grains.

As the compound powder of Opium contains 10 per cent. of opium, this is about the same as the U. S. 1870 preparation, which was made as follows:

Opium, in fine powder, 270 grains.
Aromatic Powder, 6 tr.ounces.
Clarified Honey, 14 tr.ounces.

Mix, etc.

This confection was much used during the past century under the names of *Theriaca* and *Mithridate*, wonderful virtues being ascribed to it. It is still occasionally called for by those names.

465. Confectio Piperis, Br.

Confection of Pepper.

Black Pepper, in fine powder, . . 2 ounces or 2 parts.
Caraway Fruit, in fine powder, . . 3 ounces or 3 parts.
Clarified Honey, 15 ounces or 15 parts.

Rub them well together in a mortar. Dose, 60 to 120 grains.

466. Confectio Rosæ Caninæ, Br.

Confection of Hips.

Hips, deprived of their seed-like fruits, . . 1 part.
Refined Sugar, 2 parts.

Beat the Hips to a pulp in a stone mortar, and rub the pulp through a sieve, then add the sugar and rub them well together.

To American druggists, who are unacquainted with "Hips," it may be explained that it is the oval red fruit of the dog rose or wild brier, common in fields and hedges.

467. Confectio Rosæ, U. S.

Confectio Rosæ Gallicæ, Br.—Confection of Rose.

The U. S. formula is:

Red Rose (the dried petals), in No. 60 powder, 2 ounces.
Sugar, 16 ounces.
Clarified Honey, 3 ounces.
Rose Water, 4 ounces.

Rub the Rose (petals) with the Rose Water, heated to 65° C. (149° F.), then gradually add the Sugar and Honey, and beat the whole together until thoroughly mixed.

The British formula is:

Fresh Red-Rose Petals, 1 part or 1 pound.
 Refined Sugar, 3 parts or 3 pounds.

Beat the Petals to a pulp in a stone mortar, add the Sugar, and rub them well together. This is used in making several official pills, and is much prescribed in pill masses, etc.

468. Confectio Scammonii, Br.

Confection of Scammony.

Resin of Scammony, in powder, . . 6 oz. or 48 parts.
 Ginger, in powder, 3 oz. or 24 parts.
 Oil of Caraway, $\frac{1}{4}$ fl.oz. or 2 fl.parts.
 Oil of Cloves, $\frac{1}{8}$ fl.oz. or 1 fl.part.
 Syrup, 6 fl.oz. or 48 fl.parts.
 Clarified Honey, 3 oz. or 24 parts.

Rub the Powders with the Syrup and the Honey into a uniform mass, then add the Oils and mix. Dose, 10 to 30 grains.

469. Confectio Senna.

Confection of Senna.

The U. S. formula is:

Senna, in No. 60 powder, 10 ounces av.
 Coriander, in No. 40 powder, 6 ounces av.
 Cassia Fistula, bruised, 16 ounces av.
 Tamarind, 10 ounces av.
 Prune, sliced, 7 ounces av.
 Fig bruised, 12 ounces av.
 Sugar, in coarse powder, 50 ounces av.
 Water, a sufficient quantity, 57½ fl.ounces.

“Place the Cassia Fistula, Tamarind, Prune and Fig in a close vessel with 3 pints of water, and digest for 3 hours by

means of a water-bath. Separate the coarser portion with the hand, and rub the pulpy mass first through a coarse hair sieve and then through a fine one, or through a muslin cloth. Mix the residue with the remainder of the water, and having digested the mixture for a short time, treat as before, and add the product to the pulpy liquid first obtained. Then by means of a water-bath dissolve the Sugar in the pulpy liquid and evaporate the whole until it weighs 84 ounces avoirdupois. Lastly, add the Senna and Coriander, and incorporate them thoroughly with the other ingredients while yet warm."

The finished product should weigh 100 ounces av.

The Br. formula does not differ materially from this, except that extract of liquorice is added.

Confections similar to this are put up in masses of about a drachm covered with silver leaf, and sold as *Fruit Laxatives* or Cathartic Lozenges.

470. Confectio Sulphuris, Br.

Confection of Sulphur.

Sublimed Sulphur,	4 ounces or 4 parts.
Acid Tartrate of Potassium,	1 ounce or 1 part.
Syrup of Orange Peel,	4 fl.ounces or 4 fl.parts.
Tragacanth, in powder,	18 grains or $\frac{1}{24}$ part.

Rub them well together. Dose, 60 to 120 grains.

471. Confectio Terebinthenæ, Br.

Confection of Turpentine.

Oil of Turpentine,	1 fl.ounce or 1 fl.part.
Liquorice Root, in powder,	1 ounce or 1 part.
Clarified Honey,	2 ounces or 2 parts.

Rub the Oil of Turpentine with the Liquorice, add the Honey, and mix to a uniform consistence. Dose, 60 to 120 grains.

Other Confections, Conserves and Electuaries.

The foregoing official Confections embrace nearly all for which there is a demand, except those occasionally called for in recipes from old works on medicine and pharmacy.

No class distinction is now made between Confections, Conserves, and Electuaries, but they were formerly classified separately, according to their characteristics. *Confections* being of firmer consistence, and usually made of dry ingredients mixed with sugar, and made up in the form of an extract. *Conserves* being of about the same consistence, but prepared from fresh leaves, flowers, fruit, or other vegetable matter mixed with sugar to a stiff pasty mass. *Electuaries* being of much softer consistence, and prepared generally by mixing powdered substances with syrup, honey, or other saccharine liquids.

This distinction is now done away with, and all are classed under the head of Confections, but are liable to be called for by old names. The following are the most important:

472. Aromatic Confection.—Aromatic Powder, 4 tr.ounces, mixed with Clarified Honey 4 tr.ounces, or a sufficient quantity to make a mass of the proper consistence. This was formerly official in the U. S. P.

473. Confection of Almonds or Almond Paste.—Sweet Almonds, 8 ounces; White Sugar, 4 ounces; Powdered Acacia, 1 ounce. Blanch the Almonds, and beat them with the other ingredients until all are reduced to a uniform smooth confection.

Milk of Almonds may be prepared from this confection by rubbing a portion of it with water and straining through cloth.

474. Confection of Orange Peel.—Sweet Orange Peel, recently separated from the fruit by grating, 1 tr.ounce; Sugar, 3 tr.ounces. Beat them together into a confection. This was formerly official in the U. S. P.

Confection of Lemon may be made in the same way.

475. Candied Sweet Flag.—Fresh Sweet Flag or Calamus is peeled, cut in pieces or sliced, and simmered with syrup for several hours, then drained and dried. Many other confections of fresh aromatic roots, barks, fruit and flowers, may be prepared in the same manner. Angelica root, ginger root, lemon and orange peel, rose and violet flowers, and some of the aromatic seeds or fruits, as caraway, fennel, etc., are thus prepared.

Most of the other confections, conserves and electuaries are of the past, and so seldom called for that their formulas are omitted.

CORDIALES — CORDIALS.

In pharmacy a few preparations similar to elixirs are prepared and dispensed under the name of Cordials. They have probably derived their name from their similarity to the French Ratafias, Cordials or Liqueurs, which are highly flavored, stimulating beverages, weak in spirit and sweetened. In this class only those cordials which are well known to American pharmacy will be included, the others being mentioned under the heading Liqueurs, Ratafias, etc. Many preparations that are popularly known as Cordials will be found among the Elixirs, Proprietary Remedies, etc.

476. Calisaya Cordial.

Calisaya Bark,	4	ounces av.
Wild Cherry Bark,	4	ounces av.
Orange Peel, fresh,	4	ounces av.
Cinnamon Bark,	2	ounces av.
Anise Seed,	$\frac{1}{2}$	ounce av.
Angelica Seed or Root,	1	drachm.
Cloves,	1	drachm.
Cardamom Seed,	1	drachm.
Alcohol,	2	pints.
Rose Water,	1	pint.
Sugar,	3	pounds.
Water sufficient to make	1	gallon.

Chop the Orange Peel fine and grind the drugs to a coarse powder, pour the Alcohol upon them and macerate for 48 hours; then pour off the Alcohol, transfer the drugs to a percolator, pour the alcoholic tincture upon them and percolate. When no more percolate will drop add to the drugs in the percolator, first, the Rose Water and then water, continuing the percolation until 6 pints altogether of percolate is obtained. Filter clear, dissolve the sugar in the filtrate, and add enough water passed through the drugs in the percolator to make a gallon of the Cordial. It may be colored red, if desired.

This is considerably used to disguise the taste of quinine, and other disagreeable medicines, and also as a pleasant tonic cordial. Dose half a wine glassful.

477. Curaçao Cordial.

Aromatic Cordial. Elixir Curaçoa.

Bitter Orange Peel, in very coarse powder,	2 ounces av.
Cloves, in fine powder,	80 grains.
Cinnamon in fine powder,	80 grains.
Cochineal in fine powder,	60 grains.
Oil of Sweet Orange,	1 fl.drachm.
Orange Flower Water, triple,	8 fl.ounces.
Holland Gin,	1 pint.
Alcohol,	2 pints.
Sugar,	3 pounds av.
Water sufficient to make	1 gallon.

Pour the Alcohol upon the drugs, add the Oil of Orange, and macerate for 2 days; then add the Gin and 3 pints of Water, macerate for a week, filter and add the Sugar and enough water to make a gallon of the cordial.

Fresh sweet orange peel, half a pound, may be used instead of the bitter orange peel.

Curaçao Cordial may also be made from the oils as follows:

Oil of Sweet Orange,	2 fl.drachms.
Oil of Cloves,	10 minims.
Oil of Cassia,	10 minims.
Oil of Neroli,	15 minims.
Sugar,	3 pounds av.
Alcohol,	2½ pints.
Water,	4 pints.

Mix the Oils with the Alcohol, add the Water, and, after macerating a day or two, filter, dissolve the Sugar in the filtrate, and color with Cochineal Coloring.

Curaçao Cordial is used as a pleasant vehicle for the administration of medicines, and as an adjuvant. It is also frequently employed as the base of various elixirs.

478. **Gentian Cordial.**

Gentian Root,	2	ounces av.
Orange Peel, fresh,	4	ounces av.
Cinnamon Bark,	2	ounces av.
Licorice Root,	2	ounces av.
Wild Cherry Bark,	2	ounces av.
Cardamom Seed,	$\frac{1}{2}$	ounce av.
Angelica Root or Seed,	1	drachm.
Alcohol,	2	pints.
Water,	5	pints.
Sugar,	$2\frac{1}{2}$	pounds.

Chop the Orange Peel fine and grind the drugs to a coarse powder; macerate for two days with the Alcohol, and pour off; transfer the drugs to a percolator and percolate with the alcoholic tincture; add the Water in the percolator, and when all the percolate is obtained, dissolve in it the Sugar, and filter.

This is a pleasant appetizing Cordial and tonic. Dose half a wine-glassful.

479. **CREASOTUM—CREASOTE.**

Creasote is an oily liquid of a smoky odor, similar in composition and characteristics to carbolic acid. It is obtained by the dry distillation of wood, and from smoke, pyroligneous acid, soot, etc. It is frequently called for as *Oil of Soot*.

But little true Wood Creasote is now to be found in the market, it being mostly adulterated with, or entirely substituted by, Carbolic Acid.

Uses.—Creasote is used in medicine in minute doses to check internal mucous irritation, and as a cleansing application in ointments, for ulcers and sores; but it is best known as a remedy for toothache, for which it is quite popular. The dose internally is from $\frac{1}{4}$ to 2 minims, in the form of emulsion or largely diluted.

CUPRUM—COPPER.

Symbol, Cu; Atomic weight, 63.5; sp. gr. 8.9.

Copper is a well-known metallic element, extensively employed in the arts and industries of the world, and used by many nations as a small-money coin. It is found native, and combined in the form of ore in all parts of the world.

In the arts, alloys of copper are much used. Bronze, brass, german silver, gun metal, bell metal, and many others being made by combining it with various other metals. It is also used as an alloy of gold in gold coins and in making jewelry.

The following formulæ show the composition of some of the principal alloys into which copper enters :

480. Brass.—Copper and zinc combine together in all proportions to form brass, which varies in color according to the proportion of the metals.

Prince Rupert's Metal, *Pinchbeck* and *Mannheim Gold*, contain 75 to 80 per cent. of copper, and are considerably used for making cheap jewelry.

Tombac contains 84.5 per cent. of copper and 15.5 per cent. of zinc. It is used for making "*Dutch metal*," an imitation of gold leaf; used extensively for cheap work.

Casting Brass varies in composition as required for different purposes, but the usual proportion is about 70 per cent. of copper with 30 per cent. of zinc. Other metals are sometimes added in small proportions.

By lacquering brass with various kinds of lacquer it is made to imitate bronze.

481. Bronze.—This is made from copper and tin in varying proportions. It is used in making statuary and many other articles. Varieties of bronze are known as *bell metal*, which is composed of about 78 parts of copper to 22 parts of tin, and *gun metal*, which contains 90 parts of copper and 10 of tin. The ordinary *casting bronze* contains from 80 to 85 per cent. of copper, 15 to 20 per cent. of tin, and 1 or 2 per cent. of zinc.

Phosphor Bronze contains phosphorus, and is used for making ordnance and for other purposes.

Gold Bronze is brass or bronze in very fine powder; used as a substitute for gold for gilding, etc.

482. German Silver or Nickel Silver.—This is a white metal, much employed as a basis for plated ware and ornamental artistic metal work. It is composed of copper, nickel and zinc in varying proportions, to which other metals are frequently added. The average proportion for spoons, forks, etc., is 2 parts of copper, 1 of nickel, and 1 of zinc. For other purposes larger or smaller proportions of the metals are used.

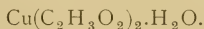
Salts of Copper.

In pharmacy the Salts of Copper are considerably used for various purposes, and in medicine they are somewhat employed in solutions, ointments, and plasters for external use, but seldom internally.

The following are the official Salts of Copper:

483. Cupri Acetas.

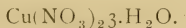
Acetate of Copper.



This is most conveniently prepared by precipitating a concentrated solution of Acetate of Lead with Sulphate of Copper, then filtering the solution, evaporating and crystallizing. This is called *Normal Cupric Acetate* to distinguish it from the *Basic Cupric Acetates*, or *Verdigris*, which is a mixture of several acetates of copper. It is used in some plasters and ointments.

484. Cupri Nitras, Br.

Nitrate of Copper.

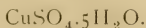


This salt is official in the Br., but not in the U. S. Pharmacopœia. It may be made by dissolving copper in nitric acid diluted with water, evaporating the solution and crystallizing.

Its solution makes a permanent blue for show bottles.

485. Cupri Sulphas.

Sulphate of Copper, Blue Vitriol.



This salt is most commonly known by the name of *Blue Vitriol* or *Blue Stone*. It is the most used of any of the copper

salts, and may be conveniently made by dissolving scraps of copper in sulphuric acid diluted with water, by the aid of heat, then evaporating the solution and crystallizing.

Dried or Anhydrous Sulphate of Copper is made by heating Sulphate of Copper until its water of crystallization has vaporized, then reducing it to a powder. It is used as a test for alcohol and as an escharotic.

Uses.—This salt is considerably used in batteries for generating electricity, for coloring and dyeing purposes, and in medicine for making various cleansing washes, liquids, etc. It is sometimes given as an astringent in doses of $\frac{1}{4}$ to 2 grains, and as a quick emetic in doses of 5 to 10 grains.

Of the Salts of Copper not officially recognized, the following are somewhat used :

486. Ammoniated Copper.— $\text{Cu}(\text{NH}_3)_4\text{SO}_4 \cdot \text{H}_2\text{O}$.—This salt was formerly official. It is made by rubbing together in a mortar 240 grains of sulphate of copper and 360 grains of carbonate of ammonium until effervescence ceases, then collecting the salt and pressing in bibulous paper.

487. Arseniate of Copper.— $\text{Cu}_3\text{As}_2\text{O}_8$.—By adding a solution of sulphate of copper to a solution of arseniate of sodium, then collecting and drying the precipitate.

488. Bromide of Copper.— CuBr_2 .—By dissolving oxide of copper in hydrobromic acid, evaporating and crystallizing.

489. Carbonate of Copper.— CuCO_3 .—By adding a solution of carbonate of sodium in excess to a solution of sulphate of copper, and warming. This is a green pigment.

490. Citrate of Copper.—By heating a solution of acetate of copper with citric acid and crystallizing.

491. Chloride of Copper.— CuCl_2 .—By dissolving copper scraps in hydrochloric acid, evaporating the solution and crystallizing.

492. Oxides of Copper.—**Suboxide of Copper, Cuprous Oxide.**— Cu_2O .—By igniting copper in fine powder in the atmosphere, or by precipitating a solution of sulphate of copper with grape sugar and caustic potassa, collecting and drying the precipitate.

Oxide of Copper, Cupric Oxide— CuO .—By heating the nitrate or carbonate of copper to redness, and continuing the heat until it remains a black heavy powder.

Many other salts of copper are formed with other acids, but they are unimportant.

493.

CYANOGEN.

CN or Cy.

Cyanogen is a gaseous radicle, discovered by M. Guy Lussac, in 1815. It is most readily obtained by igniting dry cyanide of mercury in a small retort, and collecting the gas over mercury. It is colorless, and its odor resembles that of freshly-bruised peach kernels. It is important in chemistry and pharmacy as forming a class of acids with hydrogen and oxygen, which form salts with metals and alkaline bases called *Cyanides* or *Cyanurets*. Its acids are as follows:

494. Cyanic Acid—HCNO.—Made by distilling cyanuric acid deprived of its water of crystallization in a retort, and collecting the vapor in a well-cooled receiver. *Cyanates* are salts in which the hydrogen of cyanic acid is replaced by some metallic base or other basic radical.

495. Hydrocyanic Acid—HCN—*Prussic Acid*.—This is obtained by heating ferrocyanide of potassium $2\frac{1}{4}$ ounces with sulphuric acid 1 fl.ounce (imperial measure) and 10 fl.ounces of water in a flask, and distilling, collecting the gaseous product in water, or water mixed with alcohol, until any desired percentage is obtained. The official *Diluted Hydrocyanic Acid* contains 2 per cent. of real Hydrocyanic Acid. (See page 61.)

DECOCTA — DECOCTIONS.

Decoctions which were formerly popular forms of preparing medicines have gradually given place to more scientific preparations, and are now seldom used.

The process of *Decoction* is to boil the vegetable substances for from 10 to 15 minutes in water in a covered vessel, and then cool and pour off the liquid. It is obvious that the water-bath percolator is the most convenient apparatus to use for this purpose, as there is no danger of burning the drugs or excessively heating the mixture, and when the boiling is completed the liquid may be drawn off by the stop-cock. The

following general directions for making Decoctions are therefore given :

496. Decoctions by Water-bath Percolation.

The substance, coarsely comminuted, . . . 1 ounce av.
Water enough to make 10 fl.ounces.

Having adjusted the perforated diaphragm or strainer in the bottom of a small-sized water-bath percolator, put the substance in the percolator and pour the water upon it. Cover the percolator closely with the cover, and, having filled the vessel surrounding the percolator with water, heat to boiling. Boil for 15 minutes and draw off the liquid by mean of the stop-cock, adding enough water through the percolator to make 10 fl.ounces of the product when cool.

The U. S. official directions for making Decoctions are to take of

The substance, coarsely comminuted, . . . 1 part.
Water sufficient to make 10 parts.

Put the substance into a suitable vessel provided with a cover, pour upon it 10 parts of cold water, cover and boil for 15 minutes, then strain and add water enough to make the product 10 parts.

Only two decoctions are now official in the U. S. P. They are as follows :

497. Decoctum Cetrariæ.

Decoction of Cetraria.

Cetraria (Iceland Moss), 364 grains.
Water enough to make a pint.

Cover the Cetraria with cold water for half an hour, express and throw away the liquid. Then boil the drug with a pint of water for half an hour, strain and add enough cold water through the strainer to make a pint of the finished product.

498. Decoctum Sarsaparillæ Compositum.*Compound Decoction of Sarsaparilla.*

Sarsaparilla, crushed,	729 grains.
Sassafras, in coarse powder,	156 grains.
Guaiacum Wood, rasped,	156 grains.
Liquorice Root, crushed,	156 grains.
Mezereum, crushed,	78 grains.
Water enough to make	a pint.

Boil the Sarsaparilla and Guaiacum Wood for half an hour with a pint of water; then add the Sassafras, Liquorice and Mezereum, cover the vessel well and macerate, with gentle heat for two hours; then strain and add enough water through the strainer to make a pint of the finished product.

The same directions should be followed when made by water-bath percolation.

Of the 13 Decoctions official in the 1885 Br. P., nearly all are simple decoctions, which may be included in the general directions for making Decoctions; the following require special mention:

499. Decoctum Aloes Compositum.*Compound Decoction of Aloes.*

Socotorine Aloes,	$\frac{1}{2}$ ounce av.
Myrrh,	$\frac{1}{4}$ ounce av.
Saffron,	$\frac{1}{4}$ ounce av.
Carbonate of Potassium,	$\frac{1}{4}$ ounce av.
Extract of Liquorice,	2 ounces av.
Compound Tincture of Cardamoms, 15	fl.ounces, Imp.
Distilled Water sufficient to make 50	fl.ounces, Imp.

Boil the extracts, etc., in a pint (20 ounces) of water for 5 minutes, add the Saffron, cool, add the Tincture of Cardamoms, macerate for 2 hours, then strain through flannel, adding water through the strainer to make the required measure.

500. Decoctum Cinchonæ.*Decoction of Cinchona.*

Red Cinchona Bark in No. 20 powder, . . 1¼ ounce av.
 Distilled Water, 20 fl.ounces.

Boil for 10 minutes in a covered vessel, strain the decoction, when cold, and pour as much distilled water over the contents of the strainer as will make the strained product measure 20 ounces.

Decoction of Paraira and of Oak Bark are made in the same proportion and manner by the Br. P.

501. Decoctum Granati Radicis.*Decoction of Pomegranate Root.*

Pomegranate Root Bark, sliced, . . 2 ounces av.
 Distilled Water, 40 fl.ounces, Imp.

Boil down to 20 fl.ounces and strain, making the strained product up to 20 fl.ounces if necessary by adding water through the strainer.

The remaining official British Decoctions are all made in the same manner as 500. Decoctions of Logwood, Broom, Dandelion, and Iceland Moss, are made, 1 ounce of the drug to 20 of water; of Barley and Poppy, 2 ounces to 20 of water; of Sarsaparilla, 2½ ounces to make 20 fl.ounces of the decoction, The Compound Decoction of Sarsaparilla does not differ materially from the U. S. All other Decoctions may be made by the general official formula, or by water-bath percolation, as heretofore described, in the proportion of one part of the drug to make 10 parts of decoction.

DESTILLATÆ — DISTILLATES.

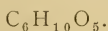
All preparations obtained by the process of distillation are Distillates, in the same sense that all preparations made by

percolation are percolates, but as distillation is a process rather than a characteristic of the substances employed, the distillates are classed under the various headings where they properly belong.

The process of distillation in pharmacy is of great importance. It is described on page 26. The preparations in which the process is employed will be found in nearly all classes of fluid galenicals.

502. DEXTRINUM — DEXTRIN.

Artificial Gum, British Gum.



When starch is subjected to the action of dilute acids at a boiling temperature, it is converted into a substance resembling gum, which is called *Dextrin*. The same also occurs when potato starch is heated to about 360°F. for an hour or two in an oven, and in this manner it is usually prepared commercially. In making an infusion of malt the Diastase acts upon the starch, first converting it into dextrin and then into sugar.

Dextrin is much used in the arts for various purposes, as a substitute for gum. It is extensively used for making paste and mucilage, and as a dusting for pills, and upon irritated surfaces.

Dextrin Syrup or *Starch Syrup* is a syrup of high conversion, containing 40 to 45 per cent. of grape sugar, and about the same of dextrin. It is considerably used as a table syrup under various fancy names, and is frequently directed in medicinal compounds.

503. Dextrin Mucilage.—A good mucilage may be made by dissolving 1 part of dextrin in 2 parts of hot water. The proportions may be varied, making a mucilage thick or thin, as desired.

DIALYSATÆ — DIALYSATES.

A number of preparations made by the process of Dialysis have recently been introduced to pharmacy and are somewhat used, the best known being Dialysed Iron. The process of Dialysis is described on page 24. The following are the preparations made by the process, but it is evident that their number may be largely increased. As Dialysis is a process rather than a characteristic of the preparation, the Dialysates might, perhaps, be more properly classed elsewhere, but, as they are so few, they are given under this heading.

504. **Ferrum Dialysatum.**

Dialysed Iron.

A Solution of Dialysed Iron or Liquor Ferri Dialysatus may be prepared as follows. It is official in the Br. P.:

Strong Solution of Perchloride of Iron (Br.

P., sp. gr. 1.42), 14 fl.ounces.

Water of Ammonia.

Water, of each, a sufficient quantity.

Mix 12 fl.ounces of the Iron Solution with 1 gallon of water in an earthenware jar that will hold 3 gallons, and add, with constant stirring, Water of Ammonia until the iron is all precipitated and the liquid remains alkaline. Let the precipitate settle, and wash it with water, as is directed for washing precipitates (page 44), until the washings give no precipitate, with solution of nitrate of silver. Then transfer the precipitate (Ferric hydrate) to a calico strainer; drain and express the water. While still moist mix the precipitate in a jar with 2 fl.ounces of the Solution of Iron, same as previously used; warm and stir them occasionally for a day or two until all has dissolved that will; then dialyse the solution as directed, changing the water every day for 10 or 12 days, or until the preparation is free from styptic taste, and clear, and make the dialysed solution measure 56 fl.ounces.

This should contain 5 per cent. of Oxide of Iron, and be of sp. gr. 1.407.

Uses.—Dialysed Iron in solution has been quite a popular form of administering iron as a tonic. It is given in doses of 10 to 30 minims.

Dialysed Iron in Scales may be made by evaporating the solution of Dialysed Iron to a syrupy consistence and spreading upon glass. The dose is from 1 to 5 grains.

505. Dialysate of Aconite.

Aconite Leaves in very coarse powder, . 16 ounces av.
Water, a sufficient quantity.

Exhaust the drug by percolating in the water-bath percolator with hot water and dialyse the percolate, saving the several waters with which the dialysis is conducted, and evaporating, by means of a water-bath, to half a pint. To this add half a pint of alcohol and filter. It will be noted that in this case it is not the contents of the dialyser that is saved, but the liquor which passes through the dialyser, and contains all but the colloid matter of the percolate.

The Dialysate has the same strength of the valuable medicinal principles of the drug as the fluid extract.

Dialysate of Belladonna, and of many other drugs, may be made in the same general way.

The process of dialysis is sometimes used to separate alkalis or other principles of plants from colloid principles.

506. DIASTASE.

The peculiar ferment in malted grains which converts the starch first into dextrin and then into grape sugar, or dextrose, is called Diastase. It acts as a very powerful ferment; one part being sufficient to convert 2,000 parts of starch into grape sugar. The chief value of extract of malt consists in the excess of diastase that it contains after converting the starch and dextrin of the malt into sugar. If this is destroyed, therefore, by excessive heat or other means in making extract of malt, the value of the extract is very much impaired.

Diastase may be obtained in an impure condition by making an infusion of malt — not heating over 160° F. — filtering, and adding the filtrate to alcohol, which precipitates the Diastase in the form of a white powder, freely soluble in water. It is an expensive chemical, seldom used, and rarely made, except by manufacturing chemists.

507.

ELATERIUM.

This is obtained from the very nearly ripe squirting cucumber fruit by cutting the fruit lengthwise and lightly pressing out the juice, then straining through a hair-cloth sieve and setting aside to deposit. The supernatant liquid is then poured off, the sediment poured on a linen filter and dried by gentle heat on porous tiles. It requires about 40 pounds of the fruit to yield half an ounce of Elaterium; it is therefore expensive and liable to adulteration.

Uses.—Elaterium is used as a purgative or hydrogogue cathartic, especially in dropsical conditions. It is generally given in the form of pills or powders, but its solution in alcohol is more effective. The dose is from $\frac{1}{16}$ to $\frac{1}{20}$ grain, repeated if necessary.

Elaterin — $C_{20}H_{28}O_5$ — is a neutral principle extracted from Elaterium by treating it with alcohol, evaporating the alcoholic tincture to the consistence of a thin oil, and pouring it while warm into a weak boiling solution of potassa. The Elaterin crystallizes, leaving the green resin in solution. The dose of Elaterin is $\frac{1}{16}$ of a grain. It is official in the U. S. P.

ELIXIRIA — ELIXIRS.

The class of preparations known in pharmacy as *Elixirs*, includes a great variety of medicines widely dissimilar in character. The first Elixirs were acid preparations prepared by alchemists and the early pharmacists. They were supposed to possess wonderful virtues. “Elixir Album” and “Elixir Rubrum” were the products of wonderful manipulations, and

were said to transmute the baser metals into pure silver and gold, and cure "most diseases in man's body." Later on, Paracelsus originated the "Elixir Proprietatis," or "Elixir of Long Life"; and still later the earlier pharmacists gave us "Elixir Paregoricum," "Elixir Salutis," "Elixir Stomachicum," "Elixir Vitriol," "Elixir Halleri," and a score of others, from which have descended some of our most popular tinctures and other similar preparations.

American Pharmacy has adopted the name "Elixir" for a class of flavored, sweetened, weakly alcoholic preparations, in which medicinal substances are exhibited in pleasant, palatable form, and which are designed to mitigate the aversion to medicines so common to invalids and delicate people. Since Elixirs have assumed this form and mission their popularity has greatly increased, and, from two or three proprietary Elixirs that were known thirty years ago, the number has grown to hundreds, and they have come to take the place, to a great extent, of tinctures and other preparations that were formerly popular forms of medicine. The number of Elixirs has increased so rapidly, and their combinations are so varied, that it is almost impossible for the druggist to keep a stock of all of them sufficient to meet the demands of his business. The formulæ for Elixirs which follow are therefore arranged so that by keeping a few of the leading bases on hand, their combinations can be readily made by adding various solutions, etc., and thus save the trouble and expense of keeping so large a variety of Elixirs on hand as would be required to supply the demands of the business.

508. Elixir Flavoring.

In former editions of FENNER'S FORMULARY this was called, simply, "Flavoring," but we have now adopted the above title as being more expressive.

Oil of Sweet Orange, fresh,	4 fl.ounces.
Oil of Caraway Seed,	2 fl.drachms.
Oil of Coriander Seed,	2 fl.drachms.
Oil of Cassia,	2 fl.drachms.
Oil of Anise, or Oil of Nutmeg,	1 fl.drachm.
Alcohol,	15 fl.ounces.

Mix. This is a strong Flavoring, of which one ounce is sufficient for a gallon of Elixir. Many Elixir Flavoring formulas have been proposed and published, but no other has been found equal in all respects to the foregoing, provided only that good materials are used in making it. Oil of Orange, it is well known, deteriorates by age and exposure, becoming terebinthine in odor, therefore it is necessary that only sweet fresh Orange Oil be used, for upon that depends the flavor of the Elixir. Oil of Caraway *Seed*, not Oil of Caraway *Chaff*, should be used. Deodorized Alcohol, or Cologne Spirit, should be employed in making the Flavoring as well as in making all the Elixirs.

When dissolved in the alcohol the flavoring will keep for any length of time; it is therefore best to get the oils as fresh as possible, and make them up, while fresh, in the flavoring.

Many formulas have been published for making Elixir Flavoring from the substances, instead of their oils: as fresh Orange Peel, Caraway Seed, Cassia Bark, etc.; but their flavor when thus prepared is uncertain, and besides the substances themselves contain astringent principles, which make inky mixtures when combined with salts of iron in solution, and are otherwise objectionable for the purpose. We therefore advise only the Flavoring made from the Oils, and from long experience choose the formula given (508) in preference to any other.

The New-York and Brooklyn Formulary publishes a formula quite similar, under the title,

509. Spiritus Aurantii Compositus.

Compound Spirit of Orange.

Oil of Bitter Orange,	4 fl.ounces.
Oil of Lemon,	1 fl.ounce.
Oil of Coriander,	160 minims.
Oil of Star Anise,	40 minims.
Deodorized Alcohol, enough to make	20 fl.ounces.

Mix them. This may be used, if preferred, in the same proportion and manner as is directed in these formulæ for Elixir Flavoring (508).

One objection to this is, that it is much more difficult to obtain a fresh fine Oil of Bitter Orange than of the Sweet Orange, although when fresh it is to be preferred to it.

510. Soluble Flavoring.

FOR ELIXIRS, ETC.

In former editions of FENNER'S FORMULARY this has been called "*Prepared Flavoring*"; but we have now adopted the above title as being more expressive.

The foregoing Flavoring (508) will not mix with the Elixir base without making a cloudy or milky mixture, and Elixir made with it has to be filtered through Carbonate of Magnesium or some other alkaline or absorbent material to make a clear solution.

It is frequently desirable to have an Elixir Flavoring that will make a clear solution when added to an elixir base, percolate or syrup, and the following is designed for that purpose:

Elixir Flavoring (508),	16	fl.ounces.
Carbonate of Magnesium,	4	ounces av.
Alcohol,	3½	pints.
Water,	4	pints.

Mix the Flavoring with the Alcohol. Rub the Carbonate of Magnesium through a wire sieve to a powder, and mix with the water; then gradually add the mixture of Magnesium and water to the solution of flavoring, and after standing a day or two (or longer), with occasional agitation, pour off the clear liquid, pour the precipitate into a paper filter, and filter the poured-off liquid through the precipitate until perfectly clear.

One ounce of the Soluble Flavoring added to a pint of any elixir or syrup base gives the required flavoring.

This is added to elixirs requiring percolation, after the percolation is completed, and to syrups, solutions, etc. It may also be added to any elixir in which a stronger flavor may be desired, and is useful for flavoring many medicinal preparations.

511. Elixir Percolating Menstruum.

In former editions of FENNER'S FORMULARY this was called "*Percolating Menstruum*."

Alcohol,	38	fl.ounces.
Water,	72	fl.ounces.

Mix them. The proportion of Alcohol and Water used is the same as is in the *Elixir*, and after the other ingredients, as Sugar and Soluble Flavoring, are added, it is the same as the Elixir.

This Elixir Percolating Menstruum is used as a percolate whenever it is necessary to obtain the strength of drugs by percolation in making elixirs. The sense of this will be apparent when it is considered that the sugar contained in the elixir would be a hindrance to percolation, and that the flavoring ingredients used would lose much of their strength during the process and exposure of percolation. In making an elixir, therefore, requiring percolation, the drugs are first percolated with the percolating menstruum, the percolate filtered if necessary, and then the sugar dissolved in the filtrate, and the soluble flavoring added, which completes the elixir.

512. Elixirs Requiring Percolation.

When it is required to make an Elixir in which the strength of the drugs is obtained by percolation, the process of water-bath percolation is recommended, but ordinary percolation may be employed instead, if more expedient. The following is the process:

The drug or drugs, as stated in the formula.

Elixir Percolating Menstruum, sufficient.

Moisten the drugs with the Elixir Percolating Menstruum, and after standing a few hours in a covered vessel transfer them to the water-bath percolator, pack moderately, pour enough of the percolating menstruum upon them to cover them well, and set in a warm place for 24 hours; then heat moderately, and after one hour begin to percolate, adding the percolating menstruum to the drugs in the percolator, and continuing the percolation until 13 fl.ounces of percolate is obtained for each pint (16 fl.ounces) of the finished Elixir required. This is then to be filtered if necessary, and to complete the Elixir take for each pint:

The Percolate, as above,	13 fl.ounces.
Sugar,	5 ounces av.
Soluble Flavoring (510),	1 fl.ounce.

Mix them and dissolve the sugar by agitation. Should it be required to remove the tannin, or otherwise treat or manipulate the percolate for any purpose, it should be done before the sugar and flavoring are added.

If small quantities only of Elixirs are required to be made, when the quantity of drugs used would be quite small, they may best be made by macerating the drugs with elixir, instead of by percolation, or, perhaps, better yet, by using fluid extracts of the drugs instead of the drugs themselves. The following is the method of procedure when fluid extracts are used :

513. Elixirs made with Fluid Extracts.

If it is desired to use Fluid Extracts of the drugs, instead of the drugs themselves, as directed in the formula, take of

Fluid Extracts of the drugs, the same fluid measure as is directed of weight.

Elixir sufficient to make the required measure, as is stated in the formula.

Mix and filter. Carbonate of Magnesium is frequently added to make them filter clear.

The Elixir in this case is used instead of the Elixir Percolating Menstruum, Soluble Flavoring and Sugar. With Fluid Extracts, which precipitate badly when added to the Elixir, it is best to mix them with the Percolating Menstruum and filter, then add the flavoring and sugar, the same as is directed in the formula.

514. Elixirs with Salts in Solution.

Some of the more soluble salts dissolve readily in the Elixirs, and others require to be dissolved separately before adding to them. Among the Solutions will be found formulæ for making solutions convenient for combining with Elixirs, etc. They are referred to in the formulæ in which they can be advantageously used.

515. Detannating Elixirs.

It is necessary in making some Elixirs and other preparations from substances containing tannin or astringent principles, to remove these principles in order that the preparations may be combined with salts of iron or other substances which would be otherwise precipitated. This may be accomplished by adding to the Elixirs any substance which will combine with the astringent principles and form precipitates which may be removed by filtration. Albumen, gelatin, and freshly precipitated ferric hydrate are the best adapted for that purpose, as they readily form precipitates with vegetable astringents. We have generally chosen albumen (white of egg) as being most convenient for the purpose, and have so directed in most of the formulas; but it is sometimes more expedient to use ferric hydrate, especially in preparations containing a large amount of astringent. To detannate with this it is necessary to make a freshly precipitated ferric hydrate as is directed (see *Ferri Oxidum Hydratum*), and mix more or less of it, as may be required, with the Elixir or other preparation to be detannated, and after standing a day or two with occasional agitation, filtering through calico. The filtered liquid is then to be tested with tincture of iron, and if tannin still remains in solution (as is shown by an inky color when it is added), more of the ferric hydrate must be added and the Elixir treated as before. This process is tedious, but thorough, and is preferred by some to any other, but in our experience albumen is sufficient for most purposes and is much to be preferred in the way of convenience.

516. Elixir.

Simple Elixir.

The simple base which is used for making Elixirs, the same as water is used for dissolving salts, or diluted alcohol for making tinctures, is variously called Elixir, Simple Elixir, Aromatic Elixir, Cordial Elixir, Curaçoa Cordial Elixir Adjuvans, etc. This base will be designated in the formulæ which follow simply as ELIXIR.

In making Elixir, only the best material should be used, the

Elixir Flavoring must be good, deodorized Alcohol or Cologne Spirit should be used; granulated Sugar is the best and most convenient, as it may readily be poured into a bottle. The following is the formula:

Elixir Flavoring (508),	1	fl.ounce.
Deodorized Alcohol (Cologne Spirit),	38	fl.ounces.
Water,	4½ pints, or 72	fl.ounces.
Sugar,	2½ pounds, or 40	ounces av.
Carbonate of Magnesium,	½	ounce av.

Mix 2 ounces of the Alcohol with the Elixir Flavoring. Rub the Magnesium Carbonate through a wire sieve to reduce it to a powder, then transfer it to a mortar that will hold at least two pints, add the mixture of Flavoring and Alcohol, and rub them well together. Mix the remaining 36 ounces of Alcohol with the Water, triturate two pints of the mixture with the contents of the mortar, and filter the mixture into the remaining mixture of Alcohol and Water, then dissolve the Sugar in the filtrate by agitation, and filter the whole Elixir through the same filter to make it bright and clear. If it is desired to increase the strength of flavor of the Elixir, a larger quantity of the Elixir Flavoring and a corresponding quantity of Carbonate of Magnesium may be used.

In making larger quantities of Elixir, as, say, 5 gallons or more, it is more conveniently made by adding the Elixir Flavoring to the entire quantity of Alcohol used; then, having mixed the powdered Carbonate Magnesium with the entire quantity of Water, gradually add the latter to the former with agitation, and let them remain for several days, with frequent agitation, before filtering; the liquid may then be filtered off and the Sugar dissolved in the filtrate. In this way any quantity of the Elixir may be made with but little trouble.

The *Elixir* as thus prepared is used as a solvent for various salts, and a vehicle for various solutions and other forms of medicine. It may also be used to percolate, but when percolation is required it is best accomplished as directed (512).

Many Elixir formulas have been proposed and published, but in an extensive experience in making Elixirs the writer has found no other equal in all respects and for all purposes to the foregoing.

517. Elixir Acetate of Potassium.

Acetate of Potassium, 1280 grains.

Elixir, sufficient to make 1 pint.

Mix and dissolve. A fl.drachm contains 10 grains of the salt. The dose is from 1 to 3 teaspoonfuls.

518. Elixir Aconite.

Tincture Aconite Root, 256 minims.

Elixir, sufficient to make 1 pint.

Mix them. A fl.drachm contains 2 minims of the tincture. The dose is from $\frac{1}{2}$ to a teaspoonful. This is a very safe and convenient preparation, as the dose of aconite can be regulated as desired.

519. Elixir Adjuvans.

Many Elixirs are known by this name. Simple Elixir is usually dispensed when Elixir Adjuvans is prescribed, unless some other preparation is known to be intended. In some localities an Adjuvant Elixir is much employed as a vehicle for Quinine, for this purpose the following is considerably used:

Orange Peel, fresh, cut fine, 8 ounces av.

Coriander Seed, crushed, 2 ounces av.

Caraway Seed, crushed, 1 ounce av.

Cardamom Seed, crushed, 8 ounces av.

Wild Cherry Bark, crushed, 8 ounces av.

Liquorice Root, crushed, 8 ounces av.

Sugar, 32 ounces av.

Alcohol, 2 pints.

Water, sufficient to make 1 gallon.

Mix the drugs and pour the Alcohol upon them, allow to stand for 24 hours, then add 2 pints of Water, macerate for 24 hours longer, then transfer to a percolator, add two pints of Water to the drugs and percolate, adding Water through the percolator until 7 pints of tincture are obtained; filter and dissolve the Sugar in the filtrate. This may be made more rapidly by water-bath percolation.

A similar preparation is put up by some manufacturers under the names *Elixir Liquorice Compound*, *Elixir Wild Cherry Compound*, *Quinine Elixir*, etc.

It is chiefly used as an addition to other preparations, or a vehicle for bitter medicines. Owing to the Tannin contained in the Wild Cherry it renders Quinine insoluble, thus masking its bitter taste.

520. Elixir Anise.

Anise Seed Cordial.

This may be made by percolation or maceration.

Anise Seed, in fine powder, 1 ounce.

Elixir, sufficient to make 1 pint.

Percolate or macerate and filter.

Or from the Oils, as directed in the New-York and Brooklyn Formulary:

Oil of Anise, Saxony, 25 minims.

Oil of Fennel Seed ("Sweet"), 5 minims.

Oil of Bitter Almonds, 1 drop.

Deodorized Alcohol, 4 fl.ounces.

Syrup, 10 fl.ounces.

Water, 2 fl.ounces.

Phosphate of Calcium, 120 grains.

Mix the Oils with the Deodorized Alcohol, add the Syrup and Water, and set aside for 12 hours; then mix with the Phosphate of Calcium and filter clear.

This Elixir is used as an aromatic vehicle, or addition to medicines, especially for children.

521. Elixir Antifebrin.

Antifebrin, 128 grains.

Elixir, sufficient to make 1 pint.

Dissolve the Antifebrin by rubbing in a mortar with the Elixir.

A fluidrachm contains 1 grain of the salt. The dose is a teaspoonful to a tablespoonful, or more.

522. Elixir Antipyrin.

Antipyrin, 640 grains.
 Elixir, sufficient to make 1 pint.

Dissolve the Antipyrin in the Elixir by rubbing them together in a mortar.

A fluidrachm contains 5 grains of the salt. The dose is a teaspoonful or more.

523. Elixir Aromatic.

Several Elixirs are known by the name of Aromatic Elixir; in fact, it is a general name for Elixirs as a class, some manufacturers calling their Elixirs Aromatic Elixirs; but the name is applied in pharmacy generally to the Simple or Aromatic Elixir prepared from substances, instead of from their oils. The following formula may be used:

Orange Peel, fresh, cut fine, 4 ounces av.
 Lemon Peel, fresh, cut fine, 1 ounce av.
 Coriander Seed, in fine powder, 1 ounce av.
 Caraway Seed, in fine powder, 1 ounce av.
 Anise Seed, in fine powder, 1 ounce av.
 Cinnamon Bark (Saigon), in fine powder, 1 ounce av.
 Sugar, 2½ pounds av.
 Alcohol, 2½ pints.
 Water, sufficient to make 1 gallon.

Macerate the drugs for 48 hours with the Alcohol, then add 4 pints of Water, and continue the maceration for 48 hours longer, pour off the liquid, transfer the drugs to a percolator, and percolate with the poured-off tincture until it has all passed, then add Water through the percolator to make the measure 6½ pints; filter clear through a little Carbonate of Magnesium, and dissolve the Sugar in the filtrate, adding Water if necessary to make a gallon.

This Elixir is used the same as Simple Elixir as a base for other Elixirs, and a vehicle for medicines, etc., but it is inadmissible for making Elixirs containing iron, bismuth, and other salts which are changed or precipitated by astringent principles.

524. Elixir Arsenic.*Elixir Arseniate of Potassium.*

Fowler's Solution of Arsenic, 640 minims.

Elixir, sufficient to make 1 pint.

Mix them. A fl.drachm contains 5 minims of Fowler's Solution. Dose, a teaspoonful. This is a safe and convenient preparation, the dose of Arsenic being regulated as desired without danger. The combinations of Arsenic and Quinine will be found under Quinine Elixirs.

525. Elixir Arsenic and Iodide of Mercury.

Donovan's Solution of Arsenic and

Iodide of Mercury, 640 minims.

Elixir, sufficient to make 1 pint.

Mix them. A fl.drachm contains 5 minims Donovan's Solution. Dose, a teaspoonful.

526. Elixir Arsenic and Strychnine.

Sulphate of Strychnine, 2 grains.

Elixir Arsenic (524), 1 pint.

Dissolve the Strychnine by rubbing with the Elixir in a mortar, or add 2 drachms of Solution of Strychnine to a pint of the Elixir of Arsenic and filter. A fl.drachm contains 5 minims of Fowler's Solution and $\frac{1}{64}$ grain Strychnine Sulphate.

527. Elixir Asafetida.

Tincture of Asafetida, 2 fl.ounces.

Spirit of Peppermint, $\frac{1}{2}$ fl.ounce.

Carbonate of Magnesium, $\frac{1}{2}$ ounce av.

Sugar, 5 ounces av.

Alcohol, 4 fl.ounces.

Water, 8 fl.ounces.

Soluble Elixir Flavoring, 1 fl.ounce.

Rub the Magnesium Carbonate to a fine powder in a mortar, mix the Tincture, Spirit and Alcohol, and rub with

the Magnesium Carbonate, then add the Water, filter, dissolve the Sugar in the filtrate, and add the Soluble Flavoring.

This Elixir is of the same strength as Syrup Asafetida, and is as agreeable a form to exhibit this disagreeable drug as can be devised, except in pills. A fl.drachm contains about 2 grains Asafetida. It is given to children and adults in doses of 1 or 2 teaspoonfuls.

528. Elixir Atropine.

Sulphate of Atropine, 2 grains.
Elixir, 1 pint.

Dissolve the Salt by rubbing in a mortar with separate portions of the Elixir, and filter if necessary. A fl.drachm contains $\frac{1}{4}$ grain of Sulphate of Atropine. For internal use this is a safe and reliable preparation. It may be given in doses of from 10 to 20 minims.

529. Elixir Beef.

Liebig's Extract of Meat, 1 ounce av.
Citric Acid, 5 grains.
Elixir, sufficient to make 1 pint.

Rub the Extract with the Elixir in a mortar, add the Citric Acid, and after standing for some time filter.

As each ounce of Liebig's Extract of Meat represents the soluble constituents of 32 ounces of fresh beef, a tablespoonful ($\frac{1}{2}$ fl.ounce) of the Elixir represents one ounce of fresh beef. The dose is from a dessert to a tablespoonful or more. Many manufacturers make the preparations of Beef with only $\frac{1}{2}$ ounce of Beef Extract in a pint.

530. Elixir Beef and Iron.

Citrate of Iron and Ammonium, 64 grains.
Elixir Beef (529), 1 pint.

Dissolve the Iron by rubbing with separate portions of the Elixir, and filter if necessary; or add to the Elixir an equivalent quantity of Solution Citrate of Iron and Ammonium. Half a fl.ounce (a tablespoonful) of this Elixir represents one

ounce of fresh beef and two grains of Soluble Citrate of Iron. The dose is from a dessert to a tablespoonful or more. This Elixir is preferable in many respects to Wine of Beef and Iron, for the reason that it is much more uniform, and will not precipitate as the wine is liable to do.

531. Elixir Beef, Iron and Cinchona.

Sulphate of Quinine,	5 grains.
Sulphate of Cinchonidine,	10 grains.
Citrate of Iron and Ammonium,	64 grains.
Elixir Beef (529),	1 pint.

Rub the salts with separate portions of the Elixir until dissolved, and filter if necessary.

Half a fl.ounce (a tablespoonful) represents one ounce of fresh beef, and the more important alkaloidal salts of about 8 grains of Cinchona, with 2 grains of Soluble Citrate of Iron. The dose is from a teaspoonful to a tablespoonful.

This is preferable to the Wine of Beef, Iron and Cinchona, for the same reasons as above stated.

532. Elixir Belladonna.

Belladonna Leaves, in coarse powder, . .	256 grains.
Elixir, sufficient to make	1 pint.

Macerate the powder with the Elixir as directed (512) and filter.

A fl.drachm represents 2 grains of Belladonna Leaves. The dose is from 20 to 60 minims, or more. This is a very convenient preparation, as the dose of Belladonna can be better regulated than in the stronger preparations.

533. Elixir Berberine.

Berberine Sulphate, or Hydrochlorate, . .	64 grains.
Alcohol,	2 fl.ounces.
Elixir,	14 fl.ounces.

Dissolve the Berberine salt first in the Alcohol by gentle heat of water-bath, then add the Elixir.

A fl.drachm contains $\frac{1}{2}$ grain of the salt. The dose is from 1 to 2 teaspoonfuls.

The Berberine salts were formerly known by the name of Hydrastin, as Muriate of Hydrastin, etc.

534. Elixir Berberine and Iron.

Pyrophosphate of Iron,	64 grains.
Hot Water,	1 fl.ounce.
Elixir Berberine,	15 fl.ounces.

Dissolve the Iron in the Hot Water and add the Elixir to the solution.

A fl.drachm contains about $\frac{1}{2}$ grain each of Iron and Berberine. Dose, 1 to 2 teaspoonfuls.

535. Elixir Berberine, Bismuth and Iron.

Citrate of Bismuth and Ammonium, . . .	64 grains.
Elixir Berberine and Iron (534),	1 pint.

Rub the Bismuth salt with the Elixir, add a few drops of Water of Ammonia to dissolve, and after standing filter.

A fl.drachm contains $\frac{1}{2}$ grain each of Bismuth, Iron and Berberine. Dose, 1 to 2 teaspoonfuls.

536. Elixir Bismuth.

Citrate of Bismuth and Ammonium, . . .	256 grains.
Elixir, sufficient to make	1 pint.
Water of Ammonia, a sufficient quantity.	

Rub the Bismuth salt with two ounces of the Elixir in a mortar, and gradually add Water of Ammonia drop by drop until the turbid solution becomes clear, or nearly clear, then add the remainder of the Elixir, and after standing a few hours filter. The Water of Ammonia is added to dissolve the Insoluble Citrate of Bismuth that may be present in the compound salt. This depends much upon the age and exposure of the salt, as it loses Ammonia when exposed. An equivalent quantity of Solution of Bismuth may be used, instead of the

salt. A fl.drachm contains 2 grains of Soluble Citrate of Bismuth. The dose is 1 or 2 teaspoonfuls.

537. Elixir Bismuth and Iron.

Citrate of Iron and Ammonium, 128 grains.
Elixir Bismuth (536), 1 pint.

Rub the Iron Salt with separate portions of the Elixir to dissolve.

A fl.drachm contains 2 grains Soluble Citrate of Bismuth and 1 grain Soluble Citrate of Iron. Dose, 1 or 2 teaspoonfuls.

538. Elixir Bismuth, Iron and Strychnine.

Sulphate of Strychnine, 1 grain.
Citrate of Iron and Ammonium, 128 grains.
Elixir of Bismuth (536), 8 fl.ounces.
Elixir, 8 fl.ounces.

Rub the Strychnine salt and Iron salt with separate portions of Elixir until dissolved; then add the Elixir Bismuth, and, after standing, filter.

A fl.drachm contains $\frac{1}{128}$ grain Strychnine and 1 grain each Soluble Citrates of Bismuth and Iron. The dose is from 1 to 2 teaspoonfuls.

This may also be made by adding equivalent quantities of Solution of Strychnine Sulphate, and Iron Citrate to Elixir Bismuth, mixed with an equal quantity of Elixir.

539. Elixir Bismuth and Strychnine.

Sulphate of Strychnine, 2 grains.
Elixir Bismuth (536), 1 pint.

Dissolve the Strychnine by rubbing with the Elixir Bismuth, or add to the Elixir Bismuth 2 fl.drachms Solution Sulphate of Strychnine, and after standing filter.

A fl.drachm of this Elixir contains 2 grains of Soluble Bismuth and $\frac{1}{64}$ grains Sulphate of Strychnine. The dose is $\frac{1}{2}$ to 1 teaspoonful.

540.

Elixir Bitter.*Elixir Amarum.*

The German Pharmacopœia of 1872 gives the following formula for this Elixir:

Extract of Buckbean,	2 parts.
Extract of Orange Peel,	2 parts.
Diluted Alcohol (G. P.),	16 parts.
Peppermint Water,	16 parts.
Spirit of Ether (Hoffman's Anodyne),	1 part.

Dissolve the Extracts in the Diluted Alcohol and Peppermint Water, previously mixed, and add the Spirit of Ether. The dose is a teaspoonful or more.

This is not properly an Elixir, as understood in American Pharmacy. The formula is different in the G. P. 1883.

541.

Elixir Blackberry.

Blackberry Root, in coarse powder,	2 ounces av.
Elixir Percolating Menstruum,	1 pint.
Sugar,	5 ounces av.
Soluble Flavoring,	1 fl.ounce.

Make by percolation as directed, 512. This may also be made by mixing —

Fluid Extract of Blackberry,	2 fl.ounces.
Elixir,	14 fl.ounces.

And filtering.

A fl.drachm contains 7 grains of Blackberry Root. The dose is from 1 to 2 teaspoonfuls.

542. Elixir Black Cohosh or Cimicifuga.

Black Cohosh, in coarse powder,	2 ounces av.
Elixir Percolating Menstruum,	1 pint.
Sugar,	5 ounces av.
Soluble Flavoring,	1 fl.ounce.

Make by percolation as directed, 512.

It may also be made by mixing—

Fluid Extract Black Cohosh,	2 fl.ounces.
Elixir,	12 fl.ounces.
Alcohol,	2 fl.ounces.

And after standing a few days, filtering through Carbonate of Magnesium.

A fl.drachm contains 7 grains of Black Cohosh. The dose is from 1 to 2 teaspoonfuls.

543. Elixir Black Cohosh Compound.

Black Cohosh, in coarse powder, . . .	1 ounce av.
Colchicum Root, in coarse powder, .	1 ounce av.
Iodide of Potassium,	256 grains.
Percolating Menstruum,	1 pint.
Sugar,	5 ounces av.
Soluble Flavoring,	1 fl.ounce.

Make by percolation as directed, 512, and dissolve the Iodide in the percolate.

This may also be made by mixing 1 ounce each of Fl. Extracts of Black Cohosh and Colchicum with 14 ounces of Elixir, and dissolving the Iodide in the Elixir.

A fl.drachm contains $3\frac{1}{2}$ grains each of Black Cohosh and Colchicum, and 2 grains of Iodide of Potassium. The dose is a teaspoonful or more for rheumatism and neuralgia.

544. Elixir Bromide of Ammonium.

Bromide of Ammonium,	640 grains.
Elixir, sufficient to make	1 pint.

Dissolve the salt in the Elixir and filter.

A fl.drachm contains 5 grains Bromide of Ammonium. The dose is from a teaspoonful to a tablespoonful.

545. Elixir Bromide of Calcium.

Bromide of Calcium, 640 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salt in the Elixir and filter.

A fl.drachm contains 5 grains Bromide of Calcium. The dose is from 1 to 2 teaspoonfuls.

546. Elixir Brom-Iodide of Calcium Compound.

Iodo-Bromide of Calcium Compound.

Tilden's Solution Iodo-Bromide Calcium

Compound, 2½ fl.ounces.

Fluid Extract of Sarsaparilla Compound, 1 fl.ounce.

Elixir, 8 fl.ounces.

Syrup, sufficient to make 1 pint.

Mix and filter if necessary.

Tilden's Elixir Iodo-Bromide of Calcium Compound is a proprietary preparation, which has had a large sale. The Solution of Iodo-Bromide of Calcium, as it is named by Tilden & Co., is prepared from the *Bittern* which remains after the crystallization of salt from natural salt water springs. It contains Iodine, Bromine, Calcium, and a number of other substances in solution. As this solution cannot be economically made from the substances themselves, and would be unlike the proprietary preparation with which the public is familiar, it is probably better to make the elixir when desired from Tilden's Solution, as above.

This Elixir is used as an alterative, in doses of a teaspoonful or more.

547. Elixir Bromide of Iron.

Bromide of Iron, 384 grains.

Citrate of Potassium, 640 grains.

Water, 2 fl.ounces.

Elixir, sufficient to make 1 pint.

Dissolve the Citrate of Potassium in 12 fl.ounces of the Elixir. Dissolve the Iron salt in 2 ounces of Water and mix the solutions, filter, and add enough Elixir if necessary to make a pint.

A fl.drachm contains 3 grains of Bromide of Iron. The Citrate of Potassium is added to overcome the styptic disagreeable taste of the Bromide of Iron. The dose is from $\frac{1}{3}$ to 1 teaspoonful.

548. Elixir Bromide of Morphine.

Bromide of Morphine, 16 grains.

Elixir, 1 pint.

Dissolve the Salt in the Elixir.

A fl.drachm contains $\frac{1}{8}$ grain Bromide of Morphine. The dose is a teaspoonful.

549. Elixir Bromide of Potassium.

Two strengths of this Elixir are common—5 grains and 10 grains of Bromide of Potassium in a fl.drachm. This is liable to confusion with physicians in prescribing it, and for that reason we prefer to stick to our old formula of 10 grains to a fl.drachm, which is none too strong for general use:

Bromide of Potassium, 1280 grains.

Elixir, sufficient to make 1 pint.

Rub the Bromide to a coarse powder, and dissolve by agitation in the Elixir. Some druggists and manufacturers color this Elixir red with Carmine solution, and some leave it colorless. It should be kept uniform, either colored or uncolored, so that customers may not be suspicious when prescriptions are refilled.

A fl.drachm contains 10 grains of the salt. The dose is from a teaspoonful to a tablespoonful.

If the Elixir containing but 5 grains of the salt in a fl.drachm is desired, dilute the above with an equal measure of Elixir, or make by dissolving 640 grains of the salt in Elixir sufficient to make a pint.

550. Elixir Bromide of Potassium and Hydrate of Chloral.

Elixir Bromide-Chloral.

Bromide of Potassium,	2 ounces av.
Hydrate of Chloral,	1 ounce av.
Elixir, sufficient to make	1 pint.

Dissolve the salts in the Elixir and filter.

A fl.drachm contains 7 grains Bromide of Potassium and $3\frac{1}{2}$ grains Hydrate of Chloral. The dose is from 1 to 2 teaspoonfuls.

The combinations of Bromide of Potassium and Hydrate of Chloral, in the form of an Elixir or Solution, have been very popular, several proprietary preparations of this kind having had a large sale as hypnotics and sedatives; one quite popular with physicians being "Bromidia," prepared by Battle & Co., Chemists Corporation, St. Louis, Mo., which, according to their published statement, contains in each fl.drachm 15 grains of Bromide of Potassium, 15 grains Hydrate of Chloral, and $\frac{1}{8}$ grain, each, extracts of Cannabis Indica and Hyoscyamus. It is claimed that alcohol should not be used in making solutions of the salts named on account of the chemical action which takes place.

551. Elixir Bromide of Potassium Compound.

Sedative Elixir.

Bromide of Potassium,	640 grains.
Sulphate of Morphine,	8 grains.
Valerianate of Ammonium,	256 grains.
Water of Ammonia,	90 minims.
Syrup,	2 fl.ounces.
Elixir, sufficient to make	1 pint.

Dissolve the Salts in the Elixir and Syrup, add the Aqua Ammonia, and color, if desired, with a little Carmine solution and Caramel, then filter.

A fl.drachm contains 5 grains Bromide of Potassium, 2 grains Valerianate of Ammonium, and $\frac{1}{16}$ grain Morphine. The dose is a teaspoonful or two.

552. Elixir Bromide of Quinine.

Bromide of Quinine, 128 grains.
Elixir, 1 pint.

Dissolve the Salt in the Elixir.

A fl.drachm contains 1 grain Bromide of Quinine. The dose is a teaspoonful or more.

553. Elixir Bromide of Sodium.

Bromide of Sodium, 1280 grains.
Elixir, sufficient to make 1 pint.

Dissolve the Salt in the Elixir, and filter.

A fl.drachm contains 10 grains Bromide of Sodium. Dose, a teaspoonful to a tablespoonful.

An Elixir containing 5 grains of the Salt in a fl.drachm may be made by diluting this one half with simple Elixir, or by dissolving 640 grains of the Salt in enough of the Elixir to make a pint.

554. Elixir Buchu.

Buchu Leaves, in coarse powder, 4 ounces av.
Elixir Percolating Menstruum, q. s., about 18 fl.ounces.
Sugar, 5 ounces av.
Soluble Flavoring, 1 fl.ounce.

Make by percolation as directed, § 12.

This Elixir may be made from Fluid Extract Buchu as follows:

Fluid Extract Buchu, 4 fl.ounces.
Carbonate of Magnesium, 2 drachms.
Elixir, 12 fl.ounces.

Rub the Fluid Extract with the Carbonate of Magnesium in a mortar, add the Elixir, and filter, adding enough Elixir through the filter to make a pint.

A fl.drachm represents 14 grains Buchu. The dose is a teaspoonful to a tablespoonful.

The New-York and Brooklyn Formulary directs Elixir Buchu to be prepared from Fluid Extract Buchu, 2 fl.ounces; Fluid Extract Triticum, 1 fl.ounce; Tincture of Vanilla, 1 fl.drachm; Syrup of Coffee, 6 fl.ounces; Carbonate of Magnesium, 120 grains, with simple Elixir enough to make a pint.

555. Elixir Buchu Compound.

Elixir Buchu and Pareira Brava.

Buchu, in coarse powder,	2 ounces av.
Pareira Brava, in coarse powder,	1 ounce av.
Stone Root, in coarse powder,	1 ounce av.
Elixir Percolating Menstruum, q. s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Flavoring,	1 fl.ounce.

Make by percolation, as directed, 512.

This Elixir may be made by mixing the Fluid Extracts of the drugs with Elixir, as directed, 513.

A fl.drachm represents 7 grains Buchu, $3\frac{1}{2}$ grains, each, Pareira Brava and Stone Root. The dose is from a teaspoonful to a tablespoonful.

Several other preparations are furnished under the name of Elixir Buchu Compound.

556. Elixir Buchu, Juniper and Acetate of Potassium.

Diuretic Elixir.

Buchu, in coarse powder,	2 ounces av.
Juniper Berries, crushed,	1 ounce av.
Acetate of Potassium,	640 grains.
Elixir Percolating Menstruum, q. s., about	18 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	5 ounces av.

Make by percolation, as directed, 512.

This may also be made with Fluid Extracts of Buchu and Juniper mixed with Elixir, filtered through Carbonate of

Magnesium and the Acetate of Potassium dissolved in the filtrate.

A fl.drachm contains 7 grains Buchu, $3\frac{1}{2}$ grains Juniper, and 5 grains Acetate of Potassium. The dose is from a teaspoonful to a tablespoonful.

557. Elixir Calisaya or Cinchona.

Elixirs of Calisaya or Cinchona and their compounds have been the best known and most popular of any ever brought to the notice of the public. Some manufacturers have introduced them as Elixir "Calisaya," while others have adopted the name "Cinchona," but the former is probably the most popular name.

The Simple Elixir of Calisaya or Cinchona is much prescribed as a tonic, and is used as the base of Compound Elixirs of Calisaya or Cinchona. It may be made either from the bark or the alkaloidal salts.

When made from the bark the Elixir must be "detannated" for combining with salts of iron; but when made from the alkaloidal salts this is avoided, and the Elixir designed to be combined with iron is now generally made from the salts. The following are the formulas for making Elixir Calisaya:

MADE FROM THE BARK, DETANNATED.

Calisaya Bark, true,	8	ounces av.
Orange Peel, fresh,	8	ounces av.
Cinnamon Bark, "Saigon,"	$1\frac{1}{2}$	ounces av.
Coriander Seed,	$1\frac{1}{2}$	ounces av.
Red Rose Leaves,	$1\frac{1}{2}$	ounces av.
Nutmeg,	$\frac{1}{2}$	ounce av.
Star Anise,	$\frac{1}{2}$	ounce av.
Sugar,	$2\frac{1}{2}$	pounds av.
Alcohol, deodorized,	38	fl.ounces.
Water, sufficient to make	1	gallon.

Grind the Calisaya Bark, Cinnamon, Coriander, Nutmeg and Anise to a No. 50 powder, and having mixed a pint of Alcohol with half pint of Water, moisten the powder with half a pint of the mixture, and macerate in a warm place for one day,

then transfer to the water-bath percolator, pack firmly, pour upon it the remainder of the menstruum, and set in a warm place for one day. Then heat very moderately, and, after one hour, begin to percolate, adding water to the drugs after the liquid has disappeared from the surface, and continuing the heat and percolation until 4 pints have passed. To this add the whites of 4 eggs, previously beaten with a portion of the percolate, and allow to stand for one day; then filter through a muslin strainer. Chop the Orange Peel fine, reduce the Red Rose leaves to a coarse powder, and having mixed them together, put them in a close vessel with the remainder (22 fl.ounces) of the Alcohol. Macerate in a warm place, with occasional agitation, for two days, then pour off the liquid and reserve. Transfer the drugs (Orange and Rose) to a conical percolator, and percolate first with the detannated Calisaya percolate, and then with water until 5 pints have passed; add this to the reserved portion, dissolve the sugar in the liquid, add enough water to make 1 gallon, and, after standing a few days, filter through a double filter paper.

Although this is a little more trouble to make than many of the Elixirs, it leaves nothing to be desired for those who wish a first-class Elixir Calisaya made from the bark.

This Elixir may be colored if desired with Cochineal coloring and Caramel. When dispensed as Elixir Calisaya it is generally colored, but left plain for making compounds. This Elixir may be made from the Fluid Extract of Calisaya Bark by mixing 1 fl.ounce with a pint of Elixir, adding the white of one egg, and after standing 24 hours, filtering.

A fl.drachm represents about 4 grains of Calisaya, with aromatics. The dose is from a teaspoonful to a tablespoonful.

558. Elixir Calisaya or Cinchona.

MADE FROM THE ALKALOIDAL SALTS.

Sulphate of Quinine,	60 grains.
Sulphate of Cinchonidine (Cinchonidia),	90 grains.
Citric Acid,	20 grains.
Water of Ammonia, q. s., or	1 fl.drachm.
Elixir, sufficient to make	1 gallon.

Rub the Quinine and the Cinchonidine with half a pint of the Elixir, and the Citric Acid with another half a pint, and mix the solutions; add to the mixture 7 pints of Elixir, and set in a warm place until the solution is clear; then add enough Water of Ammonia to neutralize the acid,* and filter.

If it is desired to dispense this as Elixir Calisaya, it may be colored with Cochineal and Caramel coloring, but if for combining it should not be colored.

This Elixir represents the more important properties of the bark in about the same proportion as contained in an average good quality of bark. The dose is from a teaspoonful to a tablespoonful.

559. Elixir Calisaya and Bismuth.

Citrate of Bismuth and Ammonium,	128 grains.
Water,	1 ounce.
Elixir Calisaya,	15 fl.ounces.

Dissolve the Bismuth in the Water by the aid of a few drops of Water of Ammonia, add the Elixir, and filter; or add $\frac{1}{2}$ fl.ounce Solution Citrate of Bismuth to a pint of Elixir Calisaya.

A fl.drachm contains 1 grain of Bismuth combined with Elixir Calisaya. The dose is 1 or 2 teaspoonfuls.

560. Elixir Calisaya, Bismuth and Strychnine.

Sulphate of Strychnine,	2 grains.
Elixir Calisaya and Bismuth,	5 grains.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 2 fl.drachms Solution of Strychnine to a pint of the Elixir, and filter.

* Before the Water of Ammonia is added the Elixir has a fluorescent or bluish appearance. Enough Ammonia should be added to remove this, but not leave any odor of Ammonia in the preparation after shaking. The quantity specified is correct if the officinal 10 per cent. Water of Ammonia is used.

A fl.drachm contains 1 grain of Bismuth, $\frac{1}{64}$ grain Strychnine combined with Elixir Calisaya. The dose is a teaspoonful.

561. Elixir Calisaya Ferrated.

Elixir Calisaya with Citrate of Iron. Ferrated Elixir Cinchona.

Citrate of Iron and Ammonium, . . . 128 grains.
Elixir Calisaya (558), 1 pint.

Dissolve the Iron salt by rubbing with successive portions of the Elixir, or use an equivalent quantity of Solution Citrate of Iron and Ammonium.

A fl.drachm contains 1 grain of the Iron salt combined with Elixir Calisaya. The dose is from 1 to 2 teaspoonfuls or more.

The Elixir of Calisaya and Citrate of Iron is of a dark wine color, similar in appearance to Wyeth's Ferrated Elixir of Cinchona.

562. Elixir Calisaya Ferrated, with Bismuth.

Elixir Calisaya, Citrate of Iron and Bismuth. Ferrated Elixir Cinchona with Bismuth.

Citrate of Bismuth and Ammonium, 128 grains.
Citrate of Iron and Ammonium, . . 128 grains.
Water, 1 ounce.
Elixir Calisaya (558), 15 fl.ounces.

Dissolve the Bismuth in the water by the aid of a few drops of water of Ammonia, dissolve the Iron salt in the Elixir by rubbing with successive portions of it, then add the solution of Bismuth and filter. This may be made by adding $\frac{1}{2}$ ounce, each, solution of Citrate of Bismuth and Ammonium, and Solution of Citrate of Iron and Ammonium to 15 ounces of Elixir Calisaya.

A fl.drachm contains 1 grain Bismuth and Iron salts, combined with Elixir Calisaya. The dose is a teaspoonful or more.

563. Elixir Calisaya Ferrated, with Bismuth and Strychnine.

Elixir Calisaya, Citrate of Iron, Bismuth and Strychnine. Ferrated Elixir Cinchona with Bismuth and Strychnine.

Sulphate of Strychnine,	1 grain.
Citrate of Bismuth and Ammonium,	128 grains.
Citrate of Iron and Ammonium,	128 grains.
Water,	1 fl.ounce.
Elixir Calisaya (558),	15 fl.ounces.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, then dissolve the Iron salt in the same manner. Dissolve the Bismuth salt in the water by the aid of a few drops of Water of Ammonia, and add to the solution, then after standing filter.

This may also be made by adding 1 fl.drachm solution of Strychnine Sulphate to a pint Elixir Calisaya Ferrated with Bismuth, or by adding equivalent quantities of solutions of Citrate of Iron, Citrate of Bismuth and Sulphate of Strychnine to Elixir Calisaya.

A fl.drachm contains 1 grain each Iron and Bismuth, and 1-128 grains of Strychnine combined with Elixir Calisaya.

This is a dark wine-colored Elixir, better known, perhaps, by the name Elixir Cinchona, Iron, Bismuth and Strychnine. A light-colored Elixir is made with Pyrophosphate of Iron instead of the Citrate. (See No. 571.)

564. Elixir Calisaya Ferrated, with Strychnine.

Elixir Cinchona, Iron and Strychnine.

Sulphate of Strychnine,	1½ grain.
Elixir Calisaya Ferrated,	1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 1½ fl.drachm of solution Sulphate of Strychnine to a pint of Ferrated Elixir Calisaya. A fl.drachm contains 1 grain Citrate of Iron, and $\frac{1}{100}$ grain Strychnine combined with Elixir Calisaya. The dose is a teaspoonful or two.

This is a dark wine-colored Elixir, better known by the name Elixir Cinchona, Iron and Strychnine. Light greenish-colored Elixirs of Calisaya, Iron and Strychnine are made with Phosphate of Iron (568) and Pyrophosphate of Iron (572).

565. Elixir Calisaya and Phosphate of Iron.

ELIXIR CALISAYA FERRI-PHOSPHATED.

Elixir Calisaya and Phosphate of Iron, Elixir Bark and Iron.

Phosphate of Iron in scales (1880), .	256 grains.
Water,	1½ fl.ounce.
Elixir Calisaya (558),	14 fl.ounces.

Dissolve the Phosphate of Iron in the water by the aid of heat, and add the Elixir; after standing, filter.

This is a fine Elixir of Calisaya with the new Phosphate of Iron. It cannot be used for combining with Ammonio-Citrate of Bismuth, because it is an acid solution; but for most purposes is preferable to the Elixir made with the Pyrophosphate of Iron.

A fl.drachm contains 2 grains of Phosphate of Iron combined with Elixir Calisaya. The dose is a teaspoonful or more. The Elixirs of Calisaya and Phosphate of Iron which are called "Ferri-phosphated" in this Formulary are of a light greenish color, similar in appearance to Caswell & Hazard's Ferro-phosphorated Elixirs of Calisaya. They are the best forms of Elixir "Bark and Iron."

Elixir Calisaya and Pyrophosphate of Iron (569) is similar in appearance and properties to this.

566. Elixir Calisaya Ferri-phosphated with Pepsin.

Elixir Calisaya, Iron and Pepsin.

Saccharated Pepsin,	256 grains.
Elixir Calisaya Ferri-phosphated (565), .	1 pint.

Mix the Pepsin with the Elixir and macerate with occasional agitation for a few days, then filter. By warming to about 120° F., this may be made in a few hours.

A fl.drachm contains 2 grains each, Phosphate of Iron and Pepsin, combined with Elixir Calisaya. Dose, a teaspoonful to a dessertspoonful.

Elixir Calisaya, Iron and Pepsin may also be made by combining Pepsin with Elixir Calisaya Ferrated (561), or Elixir Calisaya and Pyrophosphate of Iron (569) in the same manner as above directed.

567. Elixir Calisaya Ferri-phosphated with Pepsin and Strychnine.

Elixir Calisaya, Iron, Pepsin and Strychnine.

Sulphate of Strychnine, 1½ grain.

Elixir Calisaya, Iron and Pepsin (566), . . 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 1½ fl.drachm of Solution Sulphate of Strychnine to a pint of Elixir Calisaya Iron and Pepsin.

A fl.drachm contains 2 grains each, Phosphate of Iron and Pepsin, and $\frac{1}{100}$ grain Strychnine combined with Elixir Calisaya. Dose, a teaspoonful to a dessertspoonful.

Elixir Calisaya, Iron, Pepsin and Strychnine may also be made from Elixirs of Calisaya, Iron and Strychnine (564 or 572) by macerating 256 grains of Pepsin in a pint as directed (566).

568. Elixir Calisaya Ferri-phosphated with Strychnine.

Elixir Calisaya, Iron and Strychnine.

Sulphate of Strychnine, 1½ grain.

Phosphate of Iron in scales (1880), . . 256 grains.

Water, 1½ fl.ounce.

Elixir Calisaya, 14 fl.ounces.

Dissolve the Strychnine first in the water by the aid of heat, then add the Phosphate of Iron, a portion at a time until all is dissolved, to this add the Elixir Calisaya, and after standing, filter.

A fl.drachm contains 2 grains Phosphate of Iron and $\frac{1}{100}$ grain Sulphate of Strychnine combined with Elixir Calisaya. The dose is a teaspoonful or more.

This is the best one of the Elixirs Calisaya, Iron and Strychnine. It cannot be combined with Bismuth or other salts or solutions which are precipitated with acids.

For other Elixirs Calisaya or Cinchona, Iron and Strychnine, see 564, 572.

569. Elixir Calisaya and Pyrophosphate of Iron.

“Ferro-phosphorated” Elixir of Calisaya, “Ferrated Cordial Elixir.”

Pyrophosphate of Iron,	256 grains.
Water,	1 $\frac{1}{2}$ fl.ounce.
Elixir Calisaya (558),	14 fl.ounces.

Heat the water, and add the Iron salt, a portion at a time until all is dissolved, then add the Elixir Calisaya, and after standing, filter. Or add an equivalent quantity of solution Pyrophosphate of Iron to the Elixir Calisaya.

A fl.drachm contains 2 grains of Pyrophosphate of Iron combined with Elixir Calisaya.

This is similar in appearance to No. 565, but is a neutral instead of a slightly acid Elixir. It is the popular “Ferro-phosphorated Elixir of Calisaya,” which has been so long and favorably known on the market. When it is desired to make a light-colored Elixir Calisaya and Iron to combine with Bismuth, this Elixir is the one to be used.

570. Elixir Calisaya, Pyrophosphate of Iron and Bismuth.

Ferro-phosphorated Elixir of Calisaya with Bismuth.

Citrate of Bismuth and Ammonium, . .	128 grains.
Water,	1 fl.ounce.
Elixir Calisaya and Pyrophosphate of Iron,	15 fl.ounces.

Dissolve the Bismuth salt in the water by the aid of a few drops of Water of Ammonia, and add the Elixir Calisaya and Iron.

A fl.drachm contains 1 grain Bismuth and 2 grains Iron combined with Elixir Calisaya. The dose is a teaspoonful or more. This is the only light-colored Elixir of Calisaya and Iron with which Bismuth may be combined.

571. Elixir Calisaya, Pyrophosphate of Iron, Bismuth and Strychnine.

Elixir Calisaya, Iron, Bismuth and Strychnine.

Sulphate of Strychnine, 1½ grain.

Elixir Calisaya Phosphate of Iron and

Bismuth, 1 pint.

Rub the Strychnine with separate portions of the Elixir to dissolve, or add 1½ fl.drachm Solution Sulphate of Strychnine to a pint of the Elixir.

A fl.drachm contains 2 grains Iron, 1 grain Bismuth and $\frac{1}{100}$ grain Strychnine, combined with Elixir Calisaya. The dose is a teaspoonful or two.

572. Elixir Calisaya, Pyrophosphate of Iron and Strychnine.

Elixir Calisaya, Iron and Strychnine, "Ferrophosphorated Elixir of Calisaya, with Strychnine."

Sulphate of Strychnine, 1½ grain.

Elixir Calisaya and Pyrophosphate of

Iron, 1 pint.

Rub the Strychnine salt with separate portions of the Elixir to dissolve, or add 1½ fl.drachm of Solution Sulphate of Strychnine to a pint of the Elixir, and filter.

A fl.drachm contains 2 grains of Iron, and $\frac{1}{100}$ grain Strychnine combined with Elixir Calisaya.

573. Elixir Calisaya, Pyrophosphate of Iron, Bismuth and Pepsin.

Elixir Calisaya, Iron, Bismuth and Pepsin.

Saccharated Pepsin, 256 grains.
Elixir Calisaya, Pyrophosphate of Iron
and Bismuth (570), 1 pint.

Mix and macerate for several days with occasional agitation, then filter through cloth. A fl.drachm contains 2 grains each of Iron and Pepsin, and 1 grain of Bismuth, combined with Elixir Calisaya. The dose is a teaspoonful or two.

574. Elixir Calisaya, Pyrophosphate of Iron, Bismuth, and Strychnine with Pepsin.

Elixir Calisaya, Iron, Bismuth, Strychnine and Pepsin.

Saccharated Pepsin, 256 grains.
Elixir Calisaya, Iron, Bismuth and
Strychnine (571), 1 pint.

Mix and macerate for a few days then filter through cloth.

This may also be made by adding $1\frac{1}{2}$ fl.drachm solution of Strychnine to a pint of Elixir Calisaya, Iron, Bismuth and Pepsin (573).

A fl.drachm contains 2 grains Iron, 1 grain Bismuth, 2 grains Pepsin, and $\frac{1}{100}$ grain Strychnine, with Elixir Calisaya. Dose, a teaspoonful or two.

575. Elixir Calisaya and Pepsin.

Saccharated Pepsin, 256 grains.
Elixir Calisaya, 1 pint.

Mix the Pepsin with the Elixir, macerate for a few days and filter through cloth.

A fl.drachm contains 2 grains of Pepsin combined with Elixir Calisaya. The dose is a dessertspoonful or more.

576. Elixir Calisaya, Bismuth and Pepsin.

Citrate of Bismuth and Ammonium, . . . 128 grains.

Elixir Calisaya and Pepsin, 1 pint.

Dissolve the Bismuth Salt in 1 ounce of water, by the aid of a few drops Water of Ammonia, and add to the Elixir.

A fl.drachm contains 2 grains Pepsin and 1 grain Bismuth, combined with Elixir Calisaya.

577. Elixir Calisaya with Beef Extract.

Liebig's Extract of Meat, $\frac{1}{2}$ ounce av.

Elixir Calisaya, 1 pint.

Rub the Extract with the Elixir until they are uniformly mixed, macerate for a few days and filter.

The dose is from a dessert to a tablespoonful.

578. Elixir Calisaya and Iron with Beef Extract.

Elixir Calisaya, Beef and Iron.

Liebig's Extract of Meat, $\frac{1}{2}$ ounce av.

Elixir Calisaya, Ferrated (561), . . . 1 pint.

Rub the Extract with the Elixir until they are uniformly mixed, macerate for a few days and filter.

The dose is a dessertspoonful or more.

579. Elixir Calisaya, Iron and Bismuth, with Beef Extract.

Elixir Calisaya, Iron, Bismuth and Beef.

Liebig's Extract of Meat, $\frac{1}{2}$ ounce av.

Elixir Calisaya, Iron and Bismuth (562), 1 pint.

Rub the Extract with the Elixir until they are uniformly mixed, macerate for a few days and filter.

The dose is from a teaspoonful to a dessertspoonful.

580. Elixir Calisaya, Iron and Strychnine, with Extract of Beef.

Liebig's Extract of Meat, $\frac{1}{2}$ ounce av.

Elixir Calisaya, Iron and Strychnine, 1 pint.

Rub the Extract with the Elixir until they are uniformly mixed, macerate for a few days and filter.

The dose is a teaspoonful to a dessertspoonful.

581. Elixir Calisaya with Hypophosphites Compound.

Hypophosphite of Calcium (Lime), 256 grains.

Hypophosphite of Sodium (Soda), 128 grains.

Elixir Calisaya (558), 15 fl.ounces.

Hypophosphorous Acid, 1 fl.ounce.

Rub the Hypophosphites to a fine powder, then with the Elixir Calisaya, and add the Hypophosphorous Acid; when dissolved, filter.

A fl.drachm contains 3 grains Hypophosphites combined with Elixir Calisaya. The dose is a teaspoonful.

582. Elixir Calisaya with Lactopeptine.

Lactopeptine, 256 grains.

Elixir Calisaya, 1 pint.

Mix and macerate in a warm place for several days, then filter through cloth.

A fl.drachm contains 2 grains of Lactopeptine, combined with Elixir Calisaya. Dose, a dessertspoonful.

583. Elixir Calisaya and Iron with Lacto- peptine.

Lactopeptine, 256 grains.

Elixir Calisaya and Iron (565), 1 pint.

Mix and macerate in a warm place for several days, then filter through cloth.

A fl.drachm contains 2 grains of Lactopeptine, 2 grains of Phosphate of Iron, combined with Elixir Calisaya.

Dose, a teaspoonful to a dessertspoonful.

584. Elixir Calisaya, Iron and Bismuth, with Lactopeptine.

Lactopeptine, 256 grains.

Elixir Calisaya, Iron and Bismuth (570), 1 pint.

Mix and macerate in a warm place for several days, then filter through cloth.

A fl.drachm contains 2 grains Lactopeptine, 2 grains Iron and 1 grain Bismuth, combined with Elixir Calisaya.

Dose, a teaspoonful to a dessertspoonful.

585. Elixir Calisaya, Iron and Strychnine, with Lactopeptine.

Lactopeptine, 256 grains.

Elixir Calisaya, Iron and Strychnine (568), 1 pint.

Mix and macerate for several days in a warm place.

A fl.drachm contains 2 grains Lactopeptine, 2 grains Iron, and $\frac{1}{100}$ grain Strychnine, combined with Elixir Calisaya.

The dose is from a teaspoonful to a dessertspoonful.

Other combinations of Lactopeptine with Elixirs of Calisaya may be made by adding 256 grains of Lactopeptine to a pint of the combination desired.

586. Elixir Calisaya with Lactophosphate of Calcium (Lime).

Solution Lactophosphate of Calcium, . 2 fl.ounces.

Elixir Calisaya (558), 14 fl.ounces.

Mix them.

A fl.drachm contains 1 grain Lactophosphate of Calcium, combined with Elixir Calisaya.

587. Elixir Calisaya with Lactophosphates Compound.

Concentrated Solution of Phosphates,	1 fl.ounce.
Lactic Acid, concentrated,	1 fl.drachm.
Elixir Calisaya (558),	15 fl.ounces.

Mix them. The dose is a dessertspoonful.

588. Elixir Calisaya with Phosphates Compound.

Concentrated Solution Phosphates,	8 fl.ounces.
Red Cherry Juice,	1 pint.
Elixir Calisaya,	5 pints.
Syrup,	1 pint.
Water, sufficient to make	1 gallon.

Mix and filter.

As thus prepared this very much resembles a popular proprietary elixir, known as "Wheeler's Elixir." If the Red Cherry Juice is not at hand, Raspberry Juice may be used in place of it, or elixir may be used and the preparations colored red and flavored with a little Essence Bitter Almond. $\frac{1}{2}$ ounce of Lactic Acid may be added if desired, which makes the composition still more like Wheeler's.

589. Elixir Calisaya with "Protoxide" of Iron.

Elixir Peruvian Bark with "Protoxide" of Iron.

Solution of "Protoxide" of Iron,	6 fl.ounces.
Syrup,	1 pint.
Elixir Calisaya (558),	5 pints.
Water, sufficient to make	1 gallon.

Mix, color with Caramel coloring, and filter.

This Elixir is similar in composition to "Nichols'," which is a well-known proprietary Elixir.

The dose is a dessertspoonful to a tablespoonful.

590. Elixir Calisaya with Tincture Chloride of Iron.

Citrate of Potassium,	$\frac{1}{2}$ ounce av.
Tincture Chloride of Iron,	320 minims.
Elixir Calisaya (558),	15 fl.ounces.

Dissolve the salt in the Elixir, and add the Tincture of Iron; filter.

A fl.drachm contains about 6 drops Tincture of Chloride of Iron combined with Elixir Calisaya. The dose is a teaspoonful or more.

Other Calisaya Compounds.

The foregoing Compounds of Elixir Calisaya with other substances are those chiefly used, but a great variety of other combinations may be made, and some are called for occasionally. From the data given, they may be prepared without difficulty by druggists without special formulas.

591. Elixir Camphor, Mono-bromated.

Mono-bromated Camphor,	128 grains.
Alcohol,	1 fl.ounce.
Elixir,	15 fl.ounces.

Dissolve the Mono-bromated Camphor in the Alcohol, by heat of water-bath, and add the Elixir gradually to the solution.

A fl.drachm contains 1 grain of the salt.

The dose is from 1 to 4 teaspoonfuls.

592. Elixir Capsicum.

Capsicum, in fine powder,	256 grains.
Elixir,	1 pint.

Macerate the Capsicum for 5 days in the Elixir, and filter.

A fl.drachm represents 2 grains of Capsicum.

593. Elixir Cascara Sagrada.*Cascara Cordial.*

Cascara Sagrada Bark,	16	ounces av.
Liquorice Root,	6	ounces av.
Sweet Flag Root (Calamus),	2	ounces av.
Cardamom Seed,	1	ounce av.
Elixir Percolating Menstruum, q. s., about	7	pints.
Sugar,	2½	pounds av.
Soluble Flavoring,	8	fl. ounces.

Reduce the drugs to a coarse powder, and make an elixir by percolation, as directed (512).

The dose is from a dessertspoonful to a tablespoonful, or more.

As Cascara Sagrada is very bitter, Buckthorn Bark is frequently substituted for it in making this elixir, although it is not so valuable a remedy. See the Standard Remedies, Buckthorn Cordial.

594. Elixir Cathartic.

Many preparations are sold and prescribed under the above title, and as the name does not indicate any particular composition, the formulas for two of the most popular Cathartic Elixirs are given in this connection. Several others which have become popular as proprietary preparations will be found in that department, or among the Standard Remedies; and still others which are frequently called for as Cathartic Elixirs under other headings, as Elixir Laxative, Elixir Mandrake Compound, Elixir Senna Compound, the Elixirs of Rhubarb, etc., etc.

Senna,	2	ounces av.
Liquorice Root,	1	ounce av.
Epsom Salt,	1	ounce av.
Ginger,	48	grains.
Coriander,	80	grains.
Jalap,	160	grains.

Scammony,	160 grains.
Elixir Percolating Menstruum, q. s., or	1 pint.
Sugar,	5 ounces av.
Soluble Flavoring,	1 fl.ounce.

Reduce the drugs to a coarse powder, and make an elixir by percolation, as directed (512), then dissolve the Epsom Salt in the product.

The dose is a dessert to a tablespoonful.

595. Cathartic or Laxative Elixir.

Senna, in coarse powder,	2 ounces av.
Butternut Bark, in coarse powder,	1 ounce av.
Mandrake Root, in coarse power,	$\frac{1}{2}$ ounce av.
Sweet Flag Root, in coarse powder,	$\frac{1}{2}$ ounce av.
Rochelle Salts,	2 ounces av.
Bicarbonate of Sodium,	60 grains.
Elixir Percolating Menstruum, q. s., or	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), and dissolve the salts in the Elixir. The dose is a dessertspoonful to a tablespoonful, or more.

596. Elixir Celery Compound.

Celery seed, in fine powder,	1 ounce av.
Coca leaves, in coarse powder,	1 ounce av.
Black Haw Bark, in coarse powder,	1 ounce av.
Elixir Percolating Menstruum, q. s., or	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512).

A fl.drachm represents about 10 grains of the drugs. The dose is 1 to 2 teaspoonfuls.

This is similar to a popular proprietary preparation known as "*Celerina*."

597. Elixir Chloral.*Elixir Chloral Hydrate, or Hydrate of Chloral.*

Chloral (Hydrate of Chloral), in Crystals, 640 grains.

Elixir, sufficient to make 1 pint.

Dissolve the Chloral in the Elixir.

A fl.drachm contains 5 grains of Chloral. The dose is from a teaspoonful to a tablespoonful.

Elixir Butyl Chloral, or Croton Chloral may be made in the same proportion. See 622.**598. Elixir Chlorate of Potassium.**

Chlorate of Potassium in fine powder, 256 grains.

Hot water, 2 fl.ounces.

Elixir, 14 fl.ounces.

Dissolve the salt in the hot water as nearly as possible, and add the Elixir.

A fl.drachm contains 2 grains of Chlorate of Potassium. The dose is a teaspoonful or more.

599. Elixir Chloride of Ammonium.*Elixir Muriate of Ammonia.*

Chloride of Ammonium in powder, . . 1280 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salt in the Elixir and filter.

A fl.drachm contains 10 grains Chloride of Ammonium. The dose is a teaspoonful or more.

600. Elixir Chloride of Iron, Tasteless.*Elixir Muriate of Iron, Tasteless.*

Citrate of Potassium, 400 grains.

Tincture Chloride of Iron, 640 minims.

Elixir, sufficient to make 1 pint.

Dissolve the salt in the Elixir and add the tincture.

A fl.drachm contains 5 minims of Tincture Chloride of Iron, rendered tasteless by the addition of Citrate of Potassium. The dose is a teaspoonful or more.

601. Elixir Chloride of Iron and Arsenic.

Solution Chloride of Arsenic,	640 minims.
Tincture Chloride of Iron,	320 minims.
Citrate of Potassium,	240 grains.
Elixir, enough to make	1 pint.

Dissolve the salt in the Elixir, add the Tincture of Iron, and lastly the solution.

A fl.drachm contains 6 drops Tincture of Iron, and about $\frac{1}{50}$ grains Arsenic. The dose is a teaspoonful.

602. Elixir Chloroform.

Chloroform,	128 minims.
Alcohol,	1½ fl.ounce.
Elixir, sufficient to make	1 pint.

A fl.drachm contains one minim of Chloroform, making a very convenient way of regulating the dose, which is from a teaspoonful to a tablespoonful.

603. Elixir Cinchonidine.

Elixir Cinchonidia.

Sulphate of Cinchonidine,	128 grains.
Elixir,	1 pint.

Dissolve the salt by rubbing in a mortar with separate portions of the Elixir. In cold weather it may be necessary to warm the Elixir in order to effect the solution.

A fl.drachm contains one grain of the salt. The dose is from a teaspoonful to a tablespoonful.

604. Elixir Cinchonidine and Iron.

Citrate of Iron and Ammonium, . . . 128 grains.

Elixir Cinchonidine, . . . 1 pint.

Dissolve the Iron by rubbing with the Elixir. This makes a dark wine-colored Elixir. If the light-greenish color is desired, use Phosphate of Iron in scales (1880) instead of the Citrate, dissolving it in a little hot water.

A fl.drachm contains 1 grain Sulphate of Cinchonidine and 1 grain of the Iron salt. The dose is a teaspoonful or more.

605. Elixir Cinchonidine, Iron and Arsenic.

Solution Chloride of Arsenic, . . . 640 minims.

Elixir Cinchonidine and Iron, . . . 1 pint.

Mix them.

A fl.drachm contains nearly a grain each of Cinchonidine and Iron and about $\frac{1}{50}$ grain Arsenic.

606. Elixir Cinchonidine, Iron and Strychnine.

Sulphate of Strychnine, . . . 1½ grain.

Phosphate of Iron (1880) in scales, . . 128 grains.

Sulphate of Cinchonidine, . . . 128 grains.

Water, . . . 1 fl.ounce.

Elixir, . . . 15 fl.ounces.

Dissolve the Strychnine salt in the Water by the aid of heat, and then add the Iron salt, and when dissolved add the solution to the Elixir, in which the Cinchonidine has previously been dissolved.

A fl.drachm contains 1 grain each of Iron and Cinchonidine and $\frac{1}{100}$ grain Strychnine.

The dose is a teaspoonful or two.

An Elixir similar to this was formerly much used as a substitute for Elixir, Phosphate of Iron, Quinine and Strychnine, but as Quinine is now so cheap, its use has greatly decreased.

607. Elixir Cincho-Quinine.

Cincho-quinine, 128 grains.

Diluted Sulphuric Acid, q. s.

Elixir, 1 pint.

Rub the Cincho-quinine with the Elixir, and gradually add the diluted Sulphuric Acid, a few drops at a time, until the solution is complete.

A fl.drachm contains 1 grain of the salt.

The dose is a teaspoonful to a tablespoonful.

Elixirs may be made from most of the mixed salts of Cinchona, which are similar to Cincho-quinine, in the same manner as this.

608. Elixir Citrate of Caffeine.

Citrate of Caffeine, 64 grains.

Elixir, 1 pint.

Dissolve the salt in the Elixir. This may also be made double the strength of Citrate of Caffeine if desired.

A fl.drachm made as above contains $\frac{1}{2}$ grain of the Caffeine salt.

The dose is a teaspoonful to a dessertspoonful.

609. Elixir Citrate of Iron.

Citrate of Iron and Ammonium, . . . 256 grains.

Elixir, sufficient to make 1 pint.

Dissolve the Iron salt by rubbing with separate portions of the Elixir, and filter.

A fl.drachm contains 2 grains of soluble Citrate of Iron.

The dose is from a teaspoonful to a tablespoonful.

610. Elixir Citrate of Iron and Quinine.

Citrate of Iron and Quinine, 256 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salt by rubbing with separate portions of the Elixir, and filter.

This may also be made by dissolving 192 grains Citrate of Iron and Ammonium and 64 grains Quinine in a pint of the Elixir.

A fl.drachm contains 2 grains of the salt, representing about $\frac{1}{2}$ grain Quinine.

The dose is a teaspoonful or more.

611. Elixir Citrate of Iron, Quinine and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Citrate of Iron and Quinine, 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add $1\frac{1}{2}$ fl.drachm solution of Sulphate of Strychnine.

This may also be made by dissolving 256 grains of the compound salt Citrate of Iron, Quinine and Strychnine in a pint of Elixir.

A fl.drachm contains about $1\frac{1}{2}$ grain Iron, $\frac{1}{2}$ grain Quinine and $\frac{1}{100}$ grain Strychnine.

612. Elixir Citrate of Iron and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Citrate of Iron and Ammonium, 256 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salts by rubbing with the Elixir.

This may also be made from the compound salt Citrate of Iron and Strychnine by dissolving 256 grains in a pint of the Elixir.

A fl.drachm contains 2 grains Iron and $\frac{1}{100}$ grain Strychnine.

The dose is a teaspoonful to a dessertspoonful.

613. Elixir Citrate of Lithium.

Citrate of Lithium, 256 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salt in the Elixir, and filter.

A fl.drachm contains 2 grains Citrate of Lithium.

The dose is from 1 to 2 teaspoonfuls.

614. Elixir Cocaine.

Hydrochlorate of Cocaine, 32 grains.

Elixir, 1 pint.

Dissolve the salt in the Elixir.

A fl.drachm contains $\frac{1}{4}$ grain of Hydrochlorate of Cocaine.

The dose is from 1 to 2 teaspoonfuls, as an anodyne and hypnotic.

Hydrochlorate of Cocaine may be combined with many other Elixirs, and will be found advantageous in all the sedative and anodyne combinations.

615. Elixir Coffee.

Roasted Java Coffee, 4 ounces av.

Elixir Percolating Menstruum, q. s., or 1 pint.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512).

A fl.drachm represents about 15 grains of Coffee.

The dose is a teaspoonful to a tablespoonful or more.

This Elixir is used mainly to mask the taste of disagreeable medicines, and may be combined to advantage with many bitter salts, fluid extracts, etc.

616. Elixir Colombo.

Colombo, in coarse powder, 2 ounces av.

Elixir Percolating Menstruum, q. s., or 1 pint.

Sugar, 5 ounces av.

Soluble Flavoring, 1 fl. ounce.

Make by percolation as directed (512), or it may be made by rubbing 2 ounces of Fluid Extract of Colombo with 2 drachms Carbonate of Magnesium and 1 pint of Elixir, and filtering.

A fl.drachm represents 7 grains Colombo.

The dose is a teaspoonful or more.

617. Elixir Conium and Iron.

Fluid Extract of Conium, 1 fl.ounce.

Elixir Pyrophosphate of Iron, 15 fl.ounces.

Mix and, after standing, filter.

A fl.drachm contains about $3\frac{1}{2}$ grains of Conium and 2 grains Pyrophosphate of Iron.

The dose is a teaspoonful or more.

618. Elixir Corrosive Sublimate.

Elixir Bichloride of Mercury.

It is sometimes desirable to have a preparation of Bichloride of Mercury for internal use, and it is best exhibited for this purpose in the form of an Elixir, which may be made as follows:

Bichloride of Mercury, 16 grains.

Elixir, 1 pint.

Rub the salt with separate portions of the Elixir until dissolved.

A fl.drachm contains $\frac{1}{8}$ grain Corrosive Sublimate.

The dose is $\frac{1}{2}$ to 1 teaspoonful.

This is a very convenient form of preparing a solution of Bichloride of Mercury for internal use, as the dose can be easily regulated, and the metallic taste is well disguised.

619. Elixir Corydalis.

Corydalis, in coarse powder, 2 ounces av.

Elixir Percolating Menstruum, q. s., or 1 pint.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). It may also be made by mixing 2 ounces of the Fluid Extract of Corydalis with 14 ounces of Elixir.

A fl.drachm represents about $7\frac{1}{2}$ grains of the drug.

The dose is a teaspoonful or more.

620. Elixir Corydalis Compound.

Corydalis,	} of each	
Yellow Dock,		
Tag Alder,		
Figwort,		1 ounce av.
Mandrake,		
Elixir Percolating Menstruum, q. s., or		20 fl.ounces.
Sugar,		5 ounces av.
Soluble Elixir Flavoring,		1 fl.ounce.

Make by percolation as directed (512).

The dose is a teaspoonful or more as an alterative and diuretic.

621. Elixir Croton-Chloral Hydrate.*Elixir Butyl-Chloral Hydrate.*

Butyl-Chloral Hydrate,	640 grains.
Water,	4 fl.ounces.
Elixir sufficient to make,	1 pint.

Dissolve the salt in the water and add the Elixir.

A fl.drachm contains 5 grains of Butyl or Croton-Chloral Hydrate. The dose is from 1 to 2 teaspoonfuls as a hypnotic and anodyne.

622. Elixir Cyanide of Potassium.

Cyanide of Potassium,	16 grains.
Elixir,	1 pint.

Rub the salt with the Elixir until dissolved, and filter.

A fl.drachm contains $\frac{1}{8}$ grain Cyanide of Potassium. Dose, $\frac{1}{4}$ to 1 teaspoonful.

This is a convenient and safe preparation for administering this salt internally, as is sometimes desired.

623. Elixir Damiana.

Damiana Leaves,	1280 grains.
Elixir Percolating Menstruum, q. s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or it may be made by mixing 258 fl.ounces of Fl. Ext. Damiana with 1338 fl.ounces of Elixir, and filtering.

A fl.drachm represents 10 grains Damiana. The dose is from 1 to 4 teaspoonfuls as a diuretic and aphrodisiac.

624. Elixir Damiana Compound.

Fluid Extract of Buchu,	1 fl.ounce.
Fluid Extract of Nux Vomica,	2 fl.drachms.
Fluid Extract of Cubebs,	2 fl.drachms.
Fluid Extract of Damiana,	1 fl.ounce.
Carbonate of Magnesium,	60 grains.
Elixir,	14 fl.ounces.

Mix the Fluid Extracts and rub with the Carbonate of Magnesium; then add the Elixir and filter. The dose is a teaspoonful or two, as a diuretic, etc.

625. Elixir Dandelion.*Elixir of Taraxacum.*

Fluid Extract of Dandelion,	25/8 fl.ounces.
Elixir,	133/8 fl.ounces.

Mix them. A fl.drachm represents 10 grains Dandelion Root.

The dose is from a teaspoonful to a tablespoonful or more, as a laxative and tonic.

626. Elixir Dandelion Compound.*Elixir Taraxacum Compound.*

Dandelion Root in coarse powder,	16	ounces av.
Liquorice Root,	8	ounces av.
Gentian Root,	1	ounce av.

Wild Cherry Bark,	2	ounces av.
Bitter Orange Peel,	2	ounces av.
Canada Snake Root,	$\frac{1}{2}$	ounce av.
Cloves in fine powder,	$\frac{1}{4}$	ounce av.
Cinnamon, in fine powder,	1	ounce av.
Coriander, in fine powder,	1	ounce av.
Cardamom, in fine powder,	$\frac{1}{4}$	ounce av.
Elixir Percolating Menstruum, q. s., about	1	gallon.
Sugar,	2 $\frac{1}{2}$	pounds.

To make 1 gallon of the Elixir.

Make by percolation as directed (512).

This Elixir is variously prepared by different authorities, but amounts to about the same as made by any of the standard formulas. It is used chiefly as a vehicle for unpleasant medicines, and to mask the taste of Quinine. It is also given as a mild tonic and laxative in doses of a dessertspoonful or more. It has been a very popular Elixir. The New-York and Brooklyn Formulary makes Elixir Taraxacum Compound very sweet with syrup.

627. Elixir Dialysed Iron.

Elixir Ferri Dialysati.

Dialysed Iron Solution (504), 640 minims.

Elixir, sufficient to make 1 pint.

Mix them.

A fl.drachm contains 5 minims Dialysed Iron. The dose is a teaspoonful or two.

628. Elixir Digitalis.

Fluid Extract of Digitalis, 256 minims.

Elixir, sufficient to make 1 pint.

Mix them.

A fl.drachm contains 2 minims Fluid Extract of Digitalis. The dose is a teaspoonful to a tablespoonful.

629. Elixir Ergot.

Fluid Extract of Ergot, 2½ fl.ounces.

Elixir, 14 fl.ounces.

Mix them.

This is the same strength as Wine of Ergot, and is much to be preferred to it. It may also be made by percolation from freshly powdered Ergot, but is probably fully as reliable made from a good fluid extract. The dose is a teaspoonful or more.

630. Elixir Erythroxyton.

Elixir of Coca.

Coca Leaves, in coarse powder, 1280 grains.

Elixir Percolating Menstruum, q. s., about 1 pint.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). Or it may be made by mixing 25⅔ fl.ounces of Fluid Extract Erythroxyton with 13⅓ fl.ounces of Elixir.

A fl.drachm represents 10 grains Coca leaves.

The dose is 1 to 2 fl.drachms or more, as a nerve tonic, etc.

631. Elixir Eucalyptus.

Eucalyptus Leaves, in coarse powder, . . 1280 grains.

Alcohol, 2 fl.ounces.

Elixir Percolating Menstruum, q. s., about 14 fl.ounces.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). Or it may be made by mixing 25⅔ fl.ounces of Fluid Extract Eucalyptus with 2 fl.ounces of Alcohol and 11⅓ fl.ounces of Elixir.

A fl.drachm represents 10 grains Eucalyptus. The dose is a teaspoonful or more, as an aromatic stimulant.

632. Elixir Eucalyptus Compound.

Eucalyptus Leaves, in coarse powder, . . .	2 ounces av.
Liquorice Root, in coarse powder, . . .	1 ounce av.
Wild Cherry Bark, in coarse powder, . . .	1 ounce av.
Elixir Percolating Menstruum, q. s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512). It may also be made from the Fluid Extracts of Eucalyptus 2 ounces, Liquorice and Wild Cherry each 1 ounce, mixed with 12 ounces of Elixir, and filtered through a little carbonate of magnesium.

This Elixir is used mainly as a vehicle for Quinine and other bitter medicines. Its astringent properties render the Quinine insoluble, and therefore tasteless.

633. Elixir Euonymus.

Elixir of Wahoo.

Fluid Extract Wahoo,	2 fl.ounces.
Fluid Extract of Liquorice,	$\frac{1}{2}$ fl.ounce.
Elixir,	13 $\frac{1}{2}$ fl.ounces.

Mix, and, after standing, filter.

This may also be made by percolating 2 ounces av. of Wahoo and $\frac{1}{2}$ ounce of Liquorice root in coarse powder with Elixir Percolating Menstruum 1 pint, and adding Sugar 5 ounces av., and soluble Flavoring 1 fl.ounce, as directed (512).

A fl.drachm represents about 7 grains of Wahoo. The dose is a teaspoonful or more as a bitter tonic and laxative.

The New-York and Brooklyn Formulary directs Fluid Extract Euonymus 2 $\frac{1}{2}$ fl.ounces, Syrup of Coffee 2 fl.ounces, Water 2 fl.ounces, Compound Elixir of Taraxacum q. s. to make 16 fl.ounces.

634. Elixir Frangula (or Buckthorn).

The New-York and Brooklyn Formulary gives the following formula under this title. It should not be mistaken for

the proprietary preparation known as Buckthorn Cordial, which will be found among the Standard Remedies:

Fluid Extract of Frangula (Buckthorn),	4 fl.ounces.
Compound Elixir of Taraxacum, . . .	4 fl.ounces.
Simple Elixir,	8 fl.ounce.

Mix them.

A fl.drachm represents 15 grains Frangula. The dose is a dessertspoonful or more.

635. Elixir Gelsemium.

Elixir Yellow Jasmine.

Fluid Extract Gelsemium,	640 minims.
Alcohol,	2 fl.ounces.
Elixir, sufficient to make	1 pint.

Mix, and, after standing, filter.

A fl.drachm represents 5 grains Gelsemium. The dose is from $\frac{1}{2}$ to a teaspoonful.

636. Elixir Gentian.

Gentian Root, in coarse powder, . . .	2½ ounces av.
Bitter Orange Peel, in coarse powder, . .	1½ ounces av.
Coriander Seed, in fine powder,	1 ounce av.
Cardamom Seed, in fine powder,	1 ounce av.
Elixir Percolating Menstruum, q. s., about	7½ pints.
Sugar,	2½ pounds av.
Soluble Elixir Flavoring,	8 fl.ounces.

To make 1 gallon of Elixir.

Make by percolation as directed (512). Add the whites of 2 eggs, shake, allow to stand two or three days, and filter clear.

This is the same strength as the old official Compound Infusion of Gentian. The whites of eggs are added for the purpose of removing any astringent principles, so that the

Elixir may be mixed with solutions of Iron. It is the base of all the Gentian Elixirs, which may be made from it by adding various salts, solutions, etc.

The dose of the Simple Elixir of Gentian as a stomachic is a teaspoonful to a tablespoonful.

The New-York and Brooklyn Formulary directs :

Extract of Gentian,	70 grains.
Aromatic Spirit,	3 fl.drachms.
Tincture of Vanilla,	3 fl.drachms.
Syrup,	1 fl.ounce.
Simple Elixir,	16 fl.ounces.

Dissolve the Extract in the Syrup by trituration. Add the Vanilla and Elixir.

637. Elixir Gentian and Bismuth.

Citrate of Bismuth and Ammonium, . .	128 grains.
Elixir Gentian,	1 pint.

Dissolve the Bismuth salt in a little water by the aid of a few drops of Water of Ammonia, and add to the Elixir, and filter.

A fl.drachm contains 1 grain of the Bismuth salt combined with Elixir Gentian.

The dose is a teaspoonful or two—an excellent stomachic.

638. Elixir Gentian and Citrate of Iron.

Ferrated Elixir of Gentian.

Citrate of Iron and Ammonium, . .	128 grains.
Elixir Gentian,	1 pint.

Dissolve the Iron salt by rubbing with separate portions of the Elixir, and filter.

A fl.drachm contains 1 grain of Citrate of Iron combined with Elixir Gentian. The dose is a teaspoonful or two.

639. Elixir Gentian, Iron and Bismuth.

Citrate of Bismuth and Ammonium, . . . 128 grains.

Elixir Gentian and Citrate of Iron (638), 1 pint.

Dissolve the Bismuth salt in a little water by the aid of a few drops Water of Ammonia, and add to the Elixir Gentian and Iron.

A fl.drachm contains 1 grain each Iron and Bismuth combined with Elixir of Gentian. The dose is a teaspoonful or two.

640. Elixir Gentian, Iron and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Gentian and Iron (made with
either the Citrate, Phosphate, or Pyro-
phosphate of Iron), 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add an equivalent quantity of solution of Strychnine, and filter.

A fl.drachm contains $\frac{1}{100}$ grain Strychnine combined with Elixir Gentian and Iron. The dose is a teaspoonful or two.

641. Elixir Gentian, Iron, Bismuth and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Gentian, Iron and Bismuth (639), 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add an equivalent quantity of solution of Strychnine, and filter.

A fl.drachm contains 1 grain each Iron and Bismuth and $\frac{1}{100}$ grain Strychnine combined with Elixir Gentian.

The dose is a teaspoonful or two.

642. Elixir Gentian and Phosphate of Iron.*Ferri-phosphated Elixir of Gentian.*

Phosphate of Iron in scales (1880), . . .	128 grains.
Water,	1 fl.ounce.
Elixir Gentian,	15 fl.ounces.

Dissolve the Iron salt in the water by the aid of heat, add the Elixir, and filter.

A fl.drachm contains 1 grain Phosphate of Iron combined with Elixir of Gentian. The dose is a teaspoonful or two.

643. Elixir Gentian, Phosphate of Iron and Strychnine.*Ferri-phosphated Elixir of Gentian with Strychnine.*

Sulphate of Strychnine,	1½ grain.
Elixir Gentian and Phosphate of Iron,	1 pint.

Dissolve the Strychnine salt by rubbing with the Elixir, or add an equivalent quantity of solution of Strychnine.

A fl.drachm contains 1 grain of Phosphate of Iron and $\frac{1}{100}$ grain of Strychnine combined with Elixir of Gentian. The dose is a teaspoonful or two.

644. Elixir Gentian and Pyrophosphate of Iron.*Ferro-phosphorated Elixir of Gentian.*

Pyrophosphate of Iron,	128 grains.
Water,	1 fl.ounce.
Elixir Gentian,	15 fl.ounces.

Dissolve the Iron salt in the water by the aid of heat, add the Elixir of Gentian, and filter.

A fl.drachm contains 1 grain Pyrophosphate of Iron combined with Elixir Gentian. The dose is a teaspoonful or two.

Other combinations of Gentian and Pyrophosphate of Iron may be made by adding other ingredients.

645. Elixir Gentian and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.
 Elixir Gentian, 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add an equivalent quantity of solution of Strychnine, and filter.

A fl.drachm contains $\frac{1}{100}$ grain of Strychnine Sulphate combined with Elixir Gentian. The dose is a teaspoonful or more.

646. Elixir Gentian, Strychnine and Bismuth.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.
 Elixir Gentian and Bismuth (637), 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add an equivalent quantity of solution of Strychnine.

A fl.drachm contains 1 grain Bismuth and $\frac{1}{100}$ grain Strychnine combined with Elixir Bismuth. Dose, a teaspoonful.

647. Elixir Gentian with Tincture Chloride of Iron.

Solution Chloride of Iron, $1\frac{1}{2}$ fl.drachm.
 Citric Acid, 120 grains.
 Carbonate of Sodium (Sal Soda), 200 grains.
 Elixir Gentian, sufficient to make 1 pint.

Rub the Citric Acid to a powder and dissolve it in the Elixir of Gentian; add to the solution the Carbonate of Sodium in crystals, and allow to stand until effervescence ceases and the Carbonate of Sodium is dissolved; then add the solution of Iron, and after standing a day or two filter.

This may be made by using 6 fl.drachms Tincture of Chloride of Iron instead of the solution as directed.

It may also be made by taking

Tasteless Tincture Chloride of Iron, 320 minims.
 Elixir, sufficient to make 1 pint.

Mix them.

In former editions of FENNER'S FORMULARY the formula has been—

Citrate of Potassium or Sodium, . . . $\frac{1}{2}$ ounce av.
Tincture Chloride of Iron, 320 minims.
Elixir Gentian, sufficient to make . . . 1 pint.

Mix and dissolve.

All these formulæ make, practically, the same preparation; the Citrate of Potassium or Sodium which is formed making with the Solution of Iron double salts — Citro-Chloride of Iron and Sodium, or Citro-Chloride of Iron and Potassium — which have not the styptic taste of the iron salt.

A fl.drachm contains the equivalent of $2\frac{1}{2}$ minims (6 drops) of Tincture of Iron combined with Elixir of Gentian.

The dose is a teaspoonful to a dessertspoonful.

648. Elixir Gentian and Chloride of Iron with Quinine.

Sulphate of Quinine, 128 grains.
Elixir Gentian and Tincture of Iron, . . . 1 pint.

Dissolve the Quinine salt in the Elixir.

A fl.drachm contains 1 grain Sulphate of Quinine combined with Elixir Gentian and Chloride of Iron.

The dose is a teaspoonful to a dessertspoonful.

649. Elixir Gentian, Chloride of Iron, Quinine and Strychnine.

Elixir of Gentian and Chloride of Iron, . . . 1 pint.
Sulphate of Strychnine, $1\frac{1}{2}$ grain.
Sulphate of Quinine, 128 grains.

Rub the Strychnine first with separate portions of the Elixir to dissolve, then add the Quinine salt.

A fl.drachm contains 1 grain Sulphate of Quinine, $\frac{1}{100}$ grain Sulphate of Strychnine, combined with Elixir Gentian and Chloride of Iron. The dose is a teaspoonful or two.

650. Elixir Gentian and Tincture Chloride of Iron with Lactopeptine.

Lactopeptine, 256 grains.

Elixir Gentian and Chloride of Iron, 1 pint.

Macerate the Lactopeptine for 24 hours or longer, with occasional agitation, in the Elixir Gentian, etc., and filter.

A fl.drachm contains 2 grains Lactopeptine combined with Elixir Gentian and Chloride of Iron.

Other combinations of Lactopeptine with Elixirs of Gentian may be made in the same manner.

651. Elixir Ginger.

Soluble Extract of Ginger, 2 fl.ounces.

Elixir, 14 fl.ounces.

Mix them.

A fl.drachm represents about 4 grains of Ginger. The dose is a teaspoonful or more.

652. Elixir Grindelia Robusta.

Fluid Extract Grindelia Robusta, 25 $\frac{5}{8}$ fl.ounces.

Alcohol, 2 fl.ounces.

Elixir, sufficient to make 1 pint.

Carbonate of Magnesium, 2 drachms.

Rub the Carbonate of Magnesium to a fine powder, and then with the fluid extract and alcohol; then gradually add Elixir and, after standing a day or two, filter.

A fl.drachm represents 10 grains of Grindelia. The dose is a teaspoonful to a dessertspoonful.

The New-York and Brooklyn Formulary directs only 1 ounce of the fluid extract in a pint.

653. Elixir Guarana.

Fluid Extract of Guarana, 25 $\frac{5}{8}$ fl.ounces.

Elixir, sufficient to make 1 pint.

Mix them.

A fl.drachm represents 10 grains Guarana. The dose is from a teaspoonful to a dessertspoonful or more.

Some formulas for Elixir Guarana direct 4 fl.ounces in a pint. The New-York and Brooklyn Formulary directs Fluid Extract Guarana 3 fl.ounces, Elixir 3 fl.ounces, Compound Elixir Taraxacum 10 fl.ounces. The quantity directed in our formula—10 grains in a fl.drachm—is the most convenient.

654. Elixir Guarana and Celery.

Fluid Extract Guarana, 2 fl.ounces.

Fluid Extract Celery, 2 fl.ounces.

Elixir, 12 fl.ounces.

Mix them and filter.

A fl.drachm represents about 7 grains each of Celery and Guarana. The dose is a teaspoonful or more.

655. Elixir Helonias Compound.

Mitchella (Partridge Berry or Squaw Vine), 2 ounces av.

Cramp Bark, 1 ounce av.

Blue Cohosh, 1 ounce av.

Unicorn Root (Helonias), 1 ounce av.

Elixir Percolating Menstruum, q. s., about 20 fl.ounces.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). The dose is a teaspoonful or more, as a catholicon.

656. Elixir Hops, or Humulus.

Hops, in coarse powder, 2 $\frac{5}{8}$ ounces av.

Elixir Percolating Menstruum, q. s., about 18 fl.ounces.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512).

This may also be made from Fluid Extract of Hops 25½ fl.ounces, Elixir 14 fl.ounces, Carbonate of Magnesium 1 drachm. Mix and filter.

A fl.drachm represents 10 grains of Hops. The dose is a teaspoonful to a tablespoonful, as a nervine and tonic.

657. Elixir Hydrastis or Golden Seal.

Fluid Extract of Golden Seal, Aqueous, . 640 grains.

Elixir, sufficient to make 1 pint.

Mix, and, after standing, filter.

This may also be made by percolating 640 grains powdered Hydrastis with Elixir sufficient to make a pint.

A fl.drachm represents 5 grains Golden Seal. The dose is a teaspoonful to a dessertspoonful.

658. Elixir Hydrastis and Iron.

Ferri-phosphated Elixir Hydrastis.

Phosphate of Iron in scales (1880), . . 128 grains.

Water, 1 fl.ounce.

Elixir Hydrastis, 15 fl.ounces.

Dissolve the Iron salt in the water by the aid of heat, and add to the Elixir.

A fl.drachm contains 1 grain of the Iron salt combined with Elixir Hydrastis. The dose is a teaspoonful or two.

Other salts of Iron may be combined with Elixir Hydrastis in a similar manner.

659. Elixir Hydrastis, Iron and Bismuth.

Citrate of Bismuth and Ammonium, . 128 grains.

Citrate of Iron and Ammonium, . . . 128 grains.

Water, 1 fl.ounce.

Elixir Hydrastis, 15 fl.ounces.

Dissolve the Bismuth salt in the water by the aid of a few drops of Water of Ammonia; dissolve the Iron salt in the Elixir, and mix the solutions.

A fl.drachm contains 1 grain each of the Iron and Bismuth salts, combined with Elixir Hydrastis. The dose is a teaspoonful or two.

Elixir Hydrastis and Bismuth may be made the same as the above, only omitting the Iron salt.

660. Elixir Hydrastis, Iron and Strychnine.

Sulphate of Strychnine, 1½ grain.

Elixir Hydrastis and Iron, 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add 1½ fl.drachm solution of Strychnine to a pint of Elixir Hydrastis and Iron.

A fl.drachm contains $\frac{1}{100}$ grain Strychnine and 1 grain Iron, combined with Elixir Hydrastis. The dose is a teaspoonful.

Other combinations may readily be made by adding various salts, solutions or substances to Elixir Hydrastis, or by adding 1⅓ fl.ounces of Aqueous Fl. Ext. Hydrastis to a pint of other Elixirs.

661. Elixir Hyoscyamus or Henbane.

Fluid Extract of Hyoscyamus, 2¾ fl.ounces.

Elixir, sufficient to make 1 pint.

Mix them.

This may also be made by percolating 1280 grains Hyoscyamus with Elixir Percolating Menstruum 1 pint, adding Sugar 5 ounces, and Soluble Flavoring 1 ounce, as directed (512).

A fl.drachm represents 10 grains Hyoscyamus. The dose is a teaspoonful or more.

662. Elixir Hypophosphite of Calcium.

Hypophosphite of Calcium, 256 grains.

Elixir, 1 pint.

Rub the salt to a fine powder and dissolve by rubbing with separate portions of the Elixir.

A fl.drachm contains 2 grains Hypophosphite of Calcium.

The dose is a teaspoonful to a dessertspoonful.

Elixirs of other Hypophosphites, as *Hypophosphite of Sodium*, etc., may be made in the same proportion.

663. Elixir Hypophosphites Compound.

Hypophosphite of Calcium,	256 grains.
Hypophosphite of Sodium,	128 grains.
Hypophosphite of Potassium,	64 grains.
Elixir,	1 pint.

Rub the Hypophosphites to a fine powder, and with the Elixir until dissolved.

A fl.drachm contains $3\frac{1}{2}$ grains of the Hypophosphites.

The dose is a teaspoonful or two.

664. Elixir Hypophosphite of Iron.

Solution of Hypophosphite of iron,	2 fl.ounces.
Elixir,	14 fl.ounces.

Mix them.

A fl.drachm contains 1 grain Hypophosphite of Iron. The dose is a teaspoonful.

665. Elixir Ignatia.

Fluid Extract Ignatia,	1 fl.ounce.
Elixir,	15 fl.ounces.

Mix them and filter.

A fl.drachm represents $3\frac{1}{2}$ grains Ignatia. The dose is from 20 to 60 minims.

666. Elixir Iodide of Calcium.

Iodide of Calcium,	128 grains.
Elixir,	1 pint.

Dissolve the Iodide of Calcium in the Elixir.

A fl.drachm contains 1 grain of the salt. The dose is a teaspoonful or more.

667. Elixir Iodide of Iron (Tasteless).

Tasteless Iodide of Iron (the salt), . . . 256 grains.

Elixir, 1 pint.

Dissolve the salt by rubbing with the Elixir.

A fl.drachm contains 2 grains Tasteless Iodide of Iron—a salt formerly patented by J. Cruse. The dose is a teaspoonful.

668. Elixir Iodide of Potassium.

Iodide of Potassium, 640 grains.

Elixir, sufficient to make 1 pint.

Dissolve the salt in the Elixir.

A fl.drachm contains 5 grains of Iodide of Potassium. The dose is a teaspoonful or more.

Elixir Iodide of Ammonium and *Elixir Iodide of Sodium* are made in the same manner and proportion.

669. Elixir Ipecac.

Fluid Extract of Ipecac, 1 fl.ounce.

Elixir, 15 fl.ounces.

Mix and filter.

This may also be made by macerating 1 ounce of powdered Ipecac in a pint of Elixir for several days, and filtering.

A fl.drachm represents $3\frac{1}{2}$ grains of Ipecac.

The dose as an expectorant, etc., is a teaspoonful or less; as an emetic, a tablespoonful or more.

670. Elixir Ipecac and Opium.

Dover's Elixir.

Opium, in powder, 128 grains.

Ipecac, in powder, 128 grains.

Elixir, 1 pint.

Macerate the powders in the Elixir, with occasional agitation for a week, and filter.

This may also be made by taking

Tincture of Opium,	23¼ fl.ounces.
Fluid Extract of Ipecac,	¼ fl.ounce.
Elixir,	13 fl.ounces.

Mix, let stand, and filter.

A fl.drachm of this Elixir represents 1 grain each Opium and Ipecac, and is equivalent to 10 grains Dover's Powder.

Deodorized Tincture of Opium is to be preferred for making this Elixir, but is not directed, as it is not a complete representative of powdered Opium.

671. Elixir Jaborandi.

Elixir Pilocarpus.

Fluid Extract of Jaborandi,	23¼ fl.ounces.
Alcohol,	2 fl.ounces.
Elixir,	12 fl.ounces.

Mix, and after standing filter, adding a little powdered Carbonate Magnesium to the filter.

A fl.drachm represents 10 grains of Jaborandi. The dose is a teaspoonful to a dessertspoonful.

672. Elixir Juniper Berries.

Fluid Extract of Juniper Berries,	23¼ fl.ounces.
Holland Gin,	4 fl.ounces.
Elixir,	10 fl.ounces.
Carbonate of Magnesium,	1 drachm.

Mix the liquids; rub with the Carbonate Magnesium in a mortar, and filter.

A fl.drachm represents 10 grains Juniper Berries. The dose is a teaspoonful or more.

673. Elixir Kairine.

Kairine,	128 grains.
Elixir,	1 pint.

Dissolve the salt in the Elixir.

A fl.drachm contains 1 grain Kairine. The dose is a teaspoonful or two.

674. Elixir Lactate of Iron.

Solution "Protoxide of Iron,"	1 fl.ounce.
Lactic Acid, Concentrated,	1½ fl.drachm.
Elixir, sufficient to make	1 pint.

Mix them.

A fl.drachm represents 1 grain Lacto-citrate of Iron. The dose is a teaspoonful or more.

The Elixir Lactate of Iron may also be made by dissolving 128 grains Lactate of Iron in a pint of Elixir and adding 1½ fl.drachm Lactic Acid.

675. Elixir Lactate of Iron and Pepsin.

Pepsin, Saccharated,	256 grains.
Elixir Lactate of Iron,	1 pint.

Macerate the Pepsin in the Elixir for several days, and strain.

A fl.drachm contains 2 grains Saccharated Pepsin and 1 grain Lactate of Iron. Dose, a teaspoonful or two.

676. Elixir Lactopeptine.

Lactopeptine,	384 grains.
Glycerin,	2 fl.ounces.
Water,	2 fl.ounces.
Elixir,	12 fl.ounces.

Macerate the Lactopeptine in the mixed liquids for several days in a warm place. Color with cochineal coloring and filter.

A fl.drachm contains 3 grains Lactopeptine. The dose is a teaspoonful to a dessertspoonful.

A great variety of combinations of Lactopeptine with other preparations may be made by macerating 256 grains Lactopeptine in a pint of the required Elixir. The combinations of Lactopeptine with Calisaya and Gentian Elixirs will be found under those headings.

677. Elixir Lactopeptine and Bismuth.

Citrate of Bismuth and Ammonium, . . . 128 grains.

Elixir Lactopeptine (uncolored), 1 pint.

Dissolve the Bismuth salt with half an ounce of water by the aid of a few drops of Water of Ammonia, and add to the Elixir.

A fl.drachm contains 3 grains Lactopeptine and 1 grain of Bismuth. The dose is a teaspoonful or two.

678. Elixir Lactopeptine, Bismuth and Strychnine.

Sulphate of Strychnine, 1½ grain.

Elixir Lactopeptine and Bismuth, 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add an equivalent quantity of Solution of Strychnine.

A fl.drachm contains 3 grains Lactopeptine, 1 grain Bismuth, and $\frac{1}{100}$ grain Strychnine. The dose is a teaspoonful to a dessertspoonful.

679. Elixir Lactophosphate of Calcium (Lime).

Solution Lactophosphate of Calcium, . . . 2 fl.ounces.

Elixir, 14 fl.ounces.

Mix and filter.

A fl.drachm contains 2 grains Lactophosphate of Calcium. The dose is a teaspoonful or two.

680. Elixir Lactophosphate of Calcium and Iron.

Solution Phosphate of Iron, 1 fl.ounce.

Solution Lactophosphate of Calcium, . . . 1 fl.ounce.

Elixir, 14 fl.ounces.

Mix and filter.

A fl.drachm contains 1 grain each Calcium and Iron salts in solution. Dose, a teaspoonful or more.

681. Elixir Lactophosphate of Calcium with Pepsin.

Pepsin, saccharated, 256 grains.

Elixir Lactophosphate of Calcium, . . . 1 pint.

Macerate the Pepsin in the Elixir for several days, and filter.

A fl.drachm contains 2 grains each Lactophosphate of Lime and Pepsin.

A great variety of other combinations of the Lactophosphates with other substances may be made up in the form of Elixirs, by adding the solutions of Lactophosphates to the required Elixirs, or other substances to Elixirs of Lactophosphates.

682. Elixir Laxative.

A number of preparations by this name have been quite popular. The following formula makes a preparation similar to the one which has been best received:

Senna, in coarse powder, 2 ounces av.

Gentian, in coarse powder, $\frac{1}{2}$ ounce av.

Cardamom Seed, in fine powder, . . . 1 drachm.

Coriander Seed, in fine powder, . . . 1 drachm.

Elixir Percolating Menstruum, . . . 1 pint.

Sugar, 5 ounces av.

Soluble Elixir Flavoring, 1 ounce av.

Phosphate of Iron in scales (1880), . . 128 grains.

Make by percolation as directed (512). Detannate with $\frac{1}{2}$ ounce white of egg. Dissolve the Iron salt in 1 ounce of hot water, and add to the detannated Elixir. It may also be made by adding 2 fl.ounces Fluid Extract Senna and $\frac{1}{2}$ fl.ounce Tincture Cardamom Seed to 14 $\frac{1}{2}$ fl.ounces of Elixir Gentian and Phosphate of Iron. The dose is a dessertspoonful to a tablespoonful as a laxative and tonic.

Other Laxative Elixirs are noted under the Cathartic Elixirs and among the Standard Remedies.

683. Elixir Lactucarium.

Lactucarium,	256 grains.
Elixir,	1 pint.

Macerate the Lactucarium in the Elixir for 24 hours; then rub it to a smooth mixture with the Elixir, and after standing a day or two filter.

A fl.drachm contains 2 grains of Lactucarium.

The dose is a teaspoonful or more.

684. Elixir Leptandra.

Leptandra (Culver's Root), in coarse powder,	1280 grains.
Elixir Percolating Menstruum, q. s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or it may be made by mixing $2\frac{3}{4}$ fl.ounces of Fluid Extract Leptandra with enough Elixir to make a pint.

A fl.drachm represents 10 grains Leptandra.

The dose is a teaspoonful or two.

685. Elixir Liquorice.*Elixir Glycyrrhiza.*

Liquorice Root, in coarse powder, . . .	$2\frac{3}{4}$ ounces av.
Elixir Percolating Menstruum, q.s., about	1 pint.
Water of Ammonia,	1 fl.drachm.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or it may be made by mixing Fluid Extract Liquorice $2\frac{3}{4}$ fl.ounces with Water of Ammonia, 20 minims, and Elixir 14 fl.ounces.

A fl.drachm represents 10 grains of Liquorice Root.

The dose is a teaspoonful or more.

This Elixir is much used as a vehicle for bitter medicines, as Quinine, etc.

686. Elixir Liquorice Compound.*Elixir Glycyrrhiza Compound.*

Liquorice Root, in coarse powder, . . .	1 ½ ounce av.
Wild Cherry, in coarse powder, . . .	1 ounce av.
Cardamom Seed, in fine powder, . . .	1 drachm.
Coriander Seed, in fine powder, . . .	1 drachm.
Cinnamon, in fine powder,	1 drachm.
Elixir Percolating Menstruum, q.s., about	1 pint.
Water of Ammonia,	1 fl.drachm.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or add the Fluid Extract of the drugs to Elixir, as directed (513).

This Elixir is used chiefly as a vehicle for Quinine and other bitter medicines.

687. Elixir Lobelia Compound.

Lobelia, in coarse powder,	1 ounce av.
Bloodroot, in coarse powder,	1 ounce av.
Skunk Cabbage, in coarse powder, . . .	1 ounce av.
Elixir Percolating Menstruum, q.s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or add 1 ounce each of the Fluid Extracts of the drugs to 13 fl.ounces of Elixir.

The dose is ½ to 1 teaspoonful as an expectorant.

688. Elixir Lupulin.

Alcohol,	4 fl.ounces.
Lupulin,	2¾ ounces av.
Elixir Percolating Menstruum, q.s., about	12 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or add 23 $\frac{1}{4}$ fl.ounces of the Fluid Extract Lupulin to 14 fl.ounces Elixir, and filter through Carbonate Magnesium.

A fl.drachm represents 10 grains Lupulin.

The dose is a teaspoonful.

689.

Elixir Malt.

Extract of Malt, 4 fl.ounces.

Elixir, 12 fl.ounces.

Mix thoroughly, and, after standing, strain or filter.

The dose is a tablespoonful to a wineglassful.

690. Elixir Malt with Hypophosphites.

Extract of Malt, 4 fl.ounces.

Elixir Hypophosphites Compound (663), 12 fl.ounces.

Mix thoroughly, and, after standing, strain or filter.

The dose is a dessertspoonful.

691.

Elixir Malt and Iron.

Phosphate of Iron in scales (1880), . . 128 grains.

Water, 1 fl.ounce.

Elixir Malt, 15 fl.ounces.

Dissolve the Iron salt in the Water by the aid of heat and add to the Elixir.

A fl.drachm contains 1 grain Phosphate of Iron combined with Elixir Malt. The dose is a dessertspoonful.

692.

Other Malt Elixirs.

A great variety of combinations of Malt with other Elixirs may be made either by adding 4 fl.ounces of Extract of Malt to the required Elixir as directed (690), or adding the required substances to Elixir Malt, as directed (691).

693. Elixir Mandrake or May Apple.*Elixir Podophyllum Compound.*

Fluid Extract of Mandrake,	2 fl.ounces.
Alcohol,	2 fl.ounces.
Elixir,	12 fl.ounces.

Mix them, and, after standing, filter through a little Carbonate of Magnesium.

A fl.drachm represents 7 grains Mandrake.

Dose, a teaspoonful.

694. Elixir Mandrake Compound.*Elixir Podophyllum Compound.*

Mandrake (Podophyllum), in powder,	1 ounce av.
Leptandra (Culver's Root), in powder,	1 ounce av.
Senna, in coarse powder,	1 ounce av.
Elixir Percolating Menstruum, q.s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or mix the Fluid Extracts of the drugs with Elixir, and filter through Carbonate Magnesium.

A fl.drachm contains about $3\frac{1}{2}$ grains each of the drugs.

The dose is a teaspoonful as a cholagogue and laxative.

695. Elixir Matico Compound.

Matico, in coarse powder,	1 ounce av.
Buchu, in coarse powder,	1 ounce av.
Cubeb, in fine powder,	1 ounce av.
Elixir Percolating Menstruum, q.s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or by mixing the fluid extracts of the drugs with Elixir, rubbing with Carbonate

of Magnesium, and filtering. The dose is a teaspoonful or more.

696. Elixir Mono-bromated Camphor Comp.

Mono-bromated Camphor,	16 grains.
Butyl-Chloral,	24 grains.
Spirit of Cinnamon,	1½ fl.ounce.
Tincture of Gelsemium,	80 minims.
Elixir,	1½ fl.ounce.
Syrup,	8 fl.ounces.

Rub the Butyl-Chloral and Mono-bromated Camphor with the Spirit of Cinnamon; add the Tincture of Gelsemium, then the Elixir, then the Syrup, mixing them well together.

Dose, a teaspoonful.

This is considerably prescribed in France.

697. Elixir Morphine.

Sulphate of Morphine,	16 grains.
Elixir,	1 pint.

Mix and dissolve.

A fl.drachm contains $\frac{1}{8}$ grain Sulphate of Morphine.

The dose is a teaspoonful.

This preparation is of the same strength as the *Liquor Morphice Sulphatis*, formerly official, but is a better preparation, as it will keep any length of time.

698. Elixir Nux Vomica.

Tincture Nux Vomica,	640 minims.
Diluted Sulphuric Acid,	2 fl.drachms.
Elixir, sufficient to make	1 pint.

Mix, and after standing filter.

A fl.drachm contains 5 minims Tincture Nux Vomica.

The dose is from $\frac{1}{2}$ to a teaspoonful.

699. Elixir Opium.

Opium, in powder, 128 grains.

Elixir, 1 pint.

Rub the Opium with the Elixir, and macerate for several days, then filter.

It may also be made by mixing

Tincture Opium, 2½ fl.ounces.

Elixir, sufficient to make 1 pint.

An *Elixir Opium Deodorized* may be made in the same way from the Deodorized Tincture of Opium.

A fl.drachm of Elixir Opium represents 1 grain Opium.

The dose is a teaspoonful.

A proprietary preparation known as *McMunn's Elixir of Opium* is the same as Deodorized Tincture of Opium, and should not be dispensed when Elixir Opium is directed, unless it is particularly designated.

700. Elixir Orange.

Elixir Aurantii.

Oil of Orange, fresh, 30 minims.

Alcohol, 6 fl.ounces.

Water, 10 fl.ounces.

Sugar, 5 ounces av.

Carbonate of Magnesium, 120 grains.

Dissolve the Oil of Orange in the Alcohol, rub the Magnesium Carbonate to a fine powder, and add to the Water; then gradually add the mixture of Magnesium to the Solution of Orange, and after mixing thoroughly allow to stand; then filter clear and dissolve the Sugar in the filtrate.

This Elixir is known by many names, and used mostly as an adjuvant or simple Elixir. It may also be made by macerating 4 ounces of fresh Orange Peel in half a pint of Alcohol for several days, draining and pressing; then adding 8 ounces of Water and 4 ounces of Syrup, and filtering.

For other Elixirs of Orange see Simple Elixir, Aromatic Elixir, Adjuvant Elixir, Curaçoa Cordial, etc.

701. Elixir Orange Compound.*Elixir Vicerale Hoffmanni.*

This Elixir was formerly official in the German Pharmacopœia. The formula is as follows:

Orange Peel, cut, . . .	50	parts or	3 $\frac{3}{4}$	ounces.
Cinnamon,	10	parts or	6	drachms.
Carbonate of Potassium,	2 $\frac{1}{2}$	parts or	90	grains.
Sherry Wine,	250	parts or	19	fl.ounces.
Extract of Gentian,	5	parts or	3	drachms.
Extract of Wormwood,	5	parts or	3	drachms.
Extract of Buckbean,	5	parts or	3	drachms.
Extract of Cascarella,	5	parts or	3	drachms.

Macerate the Orange, Cinnamon and Carbonate of Potassium for 8 days in the Wine, pour off, express, and dissolve the extracts in the liquid. The dose is a teaspoonful.

702. Elixir Pancreatin.

This Elixir may be made from the fresh Pancreas of the pig, as follows:

The Pancreas of 3 pigs, chopped.				
Water,			6	pints.
Glycerin,			20	fl.ounces.
Hydrochloric Acid,			2	fl.ounces.

Macerate for 3 days in a cool place, then strain and add—

Elixir,	3	pints.
Alcohol,	8	fl.ounces.
Soluble Flavoring,	2	fl.ounces.

After standing a few days filter.

This may also be made from Pancreatin:

Pancreatin,	1	ounce av.
Glycerin,	4	ounces av.
Elixir, sufficient to make	1	pint.

Macerate the Pancreatin for 24 hours or more in the Elixir and Glycerin, and filter.

The dose of Elixir Pancreatin is a dessertspoonful or more.

703. Elixir Pancreatin and Pepsin.

Pancreatin,	256 grains.
Pepsin,	256 grains.
Glycerin,	4 ounces av.
Elixir, sufficient to make	1 pint.

Macerate the powders for 24 hours or longer in the Elixir and Glycerin, and filter.

A fl.drachm contains 2 grains each Pancreatin and Pepsin.

The dose is a dessertspoonful.

704. Elixir Pancreatin, Pepsin and Bismuth.

Citrate of Bismuth and Ammonium, . .	64 grains.
Elixir, Pancreatin, and Pepsin, . . .	1 pint.

Dissolve the Bismuth salt in $\frac{1}{2}$ ounce of water by the aid of a few drops of Water of Ammonia, and add to the Elixir.

A fl.drachm contains 2 grains each Pancreatin and Pepsin and $\frac{1}{2}$ grain Bismuth. The dose is a dessertspoonful.

Other combinations of Pancreatin and Pepsin may be made in a similar manner.

705. Elixir Paraldehyd.

Paraldehyd,	640 minims.
Elixir, sufficient to make	1 pint.

Mix them.

A fl.drachm contains 5 minims Paraldehyd.

The dose is a teaspoonful to a tablespoonful as a hypnotic or anodyne.

706. Elixir Pareira Brava.

Fluid Extract Pareira Brava, 23¼ fl.ounces.

Elixir, 14 fl.ounces.

Mix them, and, after standing, filter through a little Carbonate Magnesium. It may also be made by percolating the drug with Elixir, as directed (512).

A fl.drachm represents 10 grains of the drug.

The dose is a teaspoonful to a dessertspoonful.

707. Elixir Pepsin.

Elixir of Pepsin may be prepared from the fresh stomachs of the pig or calf, or from the saccharated Pepsins, or the Pure Pepsins which are furnished by manufacturers. Elixirs of Pepsin desired to combine with other preparations, as Bismuth, Iron, etc., should be made from the Saccharated Pepsin. Some manufacturers call Wine of Pepsin and its combinations Elixirs of Pepsin.

The value of Elixirs of Pepsin and their combinations with various salts as are found on the market has been seriously questioned, and not without reason, as they present many incompatibilities; but these combinations are much used and are perhaps as valuable as many other compounds which are prescribed.

Elixir Pepsin may be prepared from the fresh stomachs as follows:

The stomachs of 6 pigs.

Water, 6 pints.

Glycerin, 20 fl.ounces.

Acetic Acid, 6 fl.ounces.

Dissect the lining membrane from the stomachs, and digest for three days in the mixture of the liquids, then strain and add

Elixir, 3 pints.

Alcohol, 8 fl.ounces.

Soluble Elixir Flavoring, 2 fl.ounces.

and, after standing a few days, filter.

This may be used as a simple Elixir of Pepsin, or may be combined with salts which are not incompatible with acids; but it forms precipitates with Bismuth and some other preparations.

708. Elixir Pepsin.

MADE FROM SACCHARATED OR POWDERED PEPSIN.

Pepsin, Saccharated or Powdered, . . .	256 grains.
Water,	3 fl.ounces.
Glycerin,	3 fl.ounces.
Elixir,	10 fl.ounces.

Macerate the Pepsin in the liquids for 24 hours or longer and strain or filter through coarse filtering paper.

A fl.drachm contains 2 grains of Saccharated or official Pepsin. The dose is from a teaspoonful to a dessertspoonful or more.

Elixir Pepsin may also be made from Scale Pepsin by first reducing it to a powder and macerating 64 grains in 3 ounces each Water and Glycerin and 10 ounces of Elixir. As thus prepared it is more than double the strength of Elixir Pepsin as made from Saccharated Pepsin, representing in a fl.drachm the equivalent of 5 grains Saccharated Pepsin. It may be colored with a little caramel if desired.

Elixirs of Pepsin are very slow to filter because of the mucous which covers the surface of the paper. They are therefore better strained through muslin.

This Elixir Pepsin should be used for combining with Bismuth, Iron salts, etc.

709. Elixir Pepsin and Bismuth.

Citrate of Bismuth and Ammonium, . . .	128 grains.
Elixir Pepsin (708),	1 pint.

Dissolve the Bismuth salt in $\frac{1}{2}$ ounce of water with the aid of a few drops of Water of Ammonia, and add to the Elixir. It may be colored, if desired, with a little caramel.

A fl.drachm contains 1 grain Bismuth combined with Elixir of Pepsin. The dose is a teaspoonful to a dessertspoonful.

710. Elixir Pepsin, Bismuth and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Pepsin and Bismuth (709), 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, then filter. Or add $1\frac{1}{2}$ drachm of Solution of Strychnine to a pint of Elixir Pepsin and Bismuth.

A fl.drachm contains 1 grain Bismuth and $\frac{1}{100}$ grain Strychnine combined with Elixir Pepsin. Dose, a teaspoonful to a dessertspoonful.

711. Elixir Pepsin, Bismuth and Iron.

Citrate of Iron and Ammonium, 128 grains.

Elixir Pepsin and Bismuth (709), 1 pint.

Dissolve the Iron salt by rubbing with separate portions of the Elixir.

This may also be made with Pyrophosphate of Iron instead of Citrate, by dissolving 128 grains of Pyrophosphate of Iron in 1 ounce hot water and adding to the Elixir.

A fl.drachm contains 1 grain each Bismuth and Iron combined with Elixir Pepsin. The dose is a teaspoonful to a dessertspoonful.

712. Elixir Pepsin, Bismuth, Iron and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Pepsin, Bismuth and Iron (711), 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add $1\frac{1}{2}$ fl.drachm of Solution of Strychnine to a pint of the Elixir.

This may also be made by dissolving 128 grains Citrate or Pyrophosphate of Iron in a pint of Elixir Pepsin, Bismuth and Strychnine.

A fl.drachm contains 1 grain each Bismuth and Iron, and $\frac{1}{100}$ grain Strychnine, combined with Elixir Pepsin. The dose is a teaspoonful to a dessertspoonful.

713. Elixir Pepsin and Iron.

Phosphate of Iron, in scales (1880), . . .	128 grains.
Water,	1 fl.ounce.
Elixir Pepsin,	15 fl.ounces.

Dissolve the Iron salt in the Water by the aid of heat and add the Elixir.

This Elixir may also be made with the same quantity of Citrate of Iron and Ammonium, or of Pyrophosphate of Iron in place of the Phosphate.

A fl.drachm contains 1 grain of the Iron salt combined with Elixir Pepsin. The dose is a dessertspoonful.

714. Elixir Pepsin, Iron and Strychnine.

Sulphate of Strychnine,	1½ grain.
Elixir Pepsin and Iron,	1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 1½ fl.drachm Solution of Strychnine to a pint of the Elixir.

A fl.drachm contains 1 grain Iron and $\frac{1}{100}$ grain Strychnine, combined with Elixir Pepsin. The dose is a teaspoonful to a dessertspoonful.

715. Elixir Pepsin and Lactic Acid.

Concentrated Lactic Acid,	64 minims.
Scale Pepsin,	64 grains.
Glycerin,	3 fl.ounces.
Water,	3 fl.ounces.
Elixir,	15 fl.ounces.

Rub the Pepsin to a powder and add to the mixed liquids, allow to stand several days, with frequent agitation, then strain through muslin.

A fl.drachm contains ½ grain pure Pepsin (equivalent to 5 grains Saccharated Pepsin) and ½ minim Lactic Acid. The dose is a teaspoonful to a dessertspoonful.

This is one of the best liquid preparations of Pepsin, but is not compatible with soluble Bismuth or Pyrophosphate of Iron. It is called by some manufacturers *Aromatic Solution of Pepsin*, *Liquor Pepsin*, etc.

This Elixir may also be made the same strength by taking 640 grains of Saccharated Pepsin, instead of the scale Pepsin, and it is frequently made with much less, from 2 to 3 grains of Saccharated Pepsin being used for each fl.drachm.

716. Elixir Pepsin and Quinine.

Sulphate of Quinine, 128 grains.

Elixir Pepsin and Lactic Acid (715), . . . 1 pint.

Rub the Quinine salt with the Elixir to dissolve.

A fl.drachm contains 1 grain Sulphate of Quinine combined with the Pepsin Elixir. The dose is a teaspoonful.

717. Elixir Pepsin, Quinine and Iron.

Phosphate of Iron, in scales (1880), . . . 128 grains.

Water, 1 fl.ounce.

Elixir Pepsin and Quinine (716), . . . 15 fl.ounces.

Dissolve the Iron salt in the Water by the aid of heat and add the Elixir.

A fl.drachm contains 1 grain each of Iron and Quinine combined with Elixir Pepsin. The dose is a teaspoonful.

718. Elixir Pepsin, Quinine and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Pepsin and Quinine (716), . . . 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add $1\frac{1}{2}$ fl.drachm of Solution of Strychnine to a pint of the Elixir.

A fl.drachm contains 1 grain Quinine and $\frac{1}{100}$ grain Strychnine combined with Elixir Pepsin. The dose is a teaspoonful.

719. Elixir Pepsin, Quinine, Iron and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Pepsin, Quinine and Iron (717), 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add $1\frac{1}{2}$ fl.drachm Solution of Strychnine to a pint of the Elixir.

A fl.drachm contains 1 grain each Quinine and Iron and $\frac{1}{100}$ grain Strychnine combined with Elixir Pepsin. The dose is a teaspoonful.

720. Elixir Pepsin and Strychnine.

Sulphate of Strychnine, $1\frac{1}{2}$ grain.

Elixir Pepsin and Lactic Acid (715), 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add $1\frac{1}{2}$ drachm Solution of Strychnine to a pint of the Elixir.

A fl.drachm contains $\frac{1}{100}$ grain Strychnine combined with Elixir Pepsin. The dose is a teaspoonful to a dessertspoonful.

721. Elixir Pepsin and Wafer Ash.

Elixir Pepsin and Ptelea.

Fluid Extract of Wafer Ash (Ptelea), 1 fl.ounce.

Elixir Pepsin, 15 fl.ounces.

Mix them and, after standing, filter clear through a little powdered charcoal.

A fl.drachm represents the soluble constituents of $3\frac{1}{2}$ grains Wafer Ash combined with Elixir Pepsin. The dose is a teaspoonful to a dessertspoonful.

A Glycerite of Pepsin and Wafer Ash is also made. See Glycerites.

Other Pepsin Elixirs.

A great variety of other combinations of Pepsin with other substances in the form of Elixirs may be made by adding Pepsin to other Elixirs, or other substances to Elixir Pepsin.

722. Elixir Phosphate of Calcium (Lime).

Solution Phosphate of Calcium, . . . 2 fl.ounces.

Elixir, 14 fl.ounces.

Mix them.

A fl.drachm contains 2 grains Phosphate of Calcium. Dose, a teaspoonful to a dessertspoonful.

723. Elixir Phosphate of Iron.

Phosphate of Iron, in scales (1880), . . 256 grains.

Water, 2 fl.ounces.

Elixir, sufficient to make 1 pint.

Dissolve the Phosphate of Iron in the Water by the aid of heat and add the Elixir.

A fl.drachm contains 2 grains Phosphate of Iron. Dose, a teaspoonful or more.

724. Elixir Phosphates Compound.

Concentrated Solution of Phosphates

Compound, 2 fl.ounces.

Elixir, 15 fl.ounces.

Mix them.

The dose is a teaspoonful, containing about $3\frac{1}{2}$ grains of the mineral Phosphates in solution, with excess of phosphoric acid.

725. Elixir Phosphate of Iron and Quinine.

Phosphate of Iron, in scales (1880), . . 256 grains.

Sulphate of Quinine, 128 grains.

Phosphoric Acid (50 per cent.), 30 minims.

Water, 2 fl.ounces.

Glycerin, 2 fl.ounces.

Elixir, 12 fl.ounces.

Mix the Elixir and Acid and dissolve the Quinine salt in the mixture by the aid of gentle heat. Dissolve the Phosphate

of Iron in the Water and Glycerin, by the aid of heat, and while both the solutions are still hot add the Quinine solution to the Iron solution. When cool filter.

It is necessary that the solutions be quite warm, about 160° F., and that they be gradually mixed together, otherwise a gelatinous mass, instead of a clear solution, will result. The Quinine solution should be added to the Iron solution.

A fl.drachm contains 2 grains Phosphate of Iron and 1 grain of Quinine. Dose, a teaspoonful or more.

726. Elixir Phosphate of Iron, Quinine and Strychnine.

Sulphate of Strychnine, 2 grains.

Elixir Phosphate of Iron and Quinine, . . . 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 2 fl.drachms Solution of Strychnine to a pint of the Elixir.

This may also be made as directed in the previous formula, by adding 2 grains of Strychnine Sulphate to the ingredients therein named and proceeding in the same manner.

A fl.drachm contains 2 grains Phosphate of Iron, 1 grain Quinine, and $\frac{1}{64}$ grain of Strychnine.

The proportion of Strychnine as prepared by manufacturers varies considerably, some using only $\frac{1}{120}$ grain, while others use as much as $\frac{1}{80}$ grain in a fl.drachm.

727. Elixir Phosphoric Acid.

Phosphoric Acid, 50 per cent. (1880), by

weight, 640 grains.

Glycerin, 3 fl.ounces.

Elixir, sufficient to make 1 pint.

Mix them and, after standing, filter.

A fl.drachm contains 5 grains Phosphoric Acid. The dose is a teaspoonful to a dessertspoonful.

This is about one-third the strength of Phosphoric Acid diluted.

728. Elixir Phosphorus.

Phosphorus, fresh (not oxidized), . . . 1½ grain.
 Absolute Alcohol, 1 fl.ounce.

Add the Phosphorus to the Alcohol contained in a small bottle and stop tightly, dissolve the Phosphorus in the Alcohol by gentle heat of water bath, then mix

Glycerine, 3 fl.ounces,
 Elixir, 12 fl.ounces,

and warm the mixture to about 140° F., and while the solution of Phosphorus is still warm add the mixture to it and mix thoroughly. Set aside in a well-stopped bottle in a cool place.

A fl.drachm contains $\frac{1}{100}$ grain of Phosphorus. The dose is a teaspoonful to a dessertspoonful.

729. Elixir Phosphorus Compound.

Elixir Phosphorus and Nux Vomica.

Tincture of Nux Vomica, 384 minims.
 Elixir Phosphorus, sufficient to make . . . 1 pint.

Mix them by adding the Elixir gradually to the Tincture.

A fl.drachm contains 3 minims of Tincture of Nux Vomica and $\frac{1}{100}$ grain Phosphorus. The dose is a teaspoonful.

730. Elixir Phosphorus, Iron, Quinine and Strychnine.

Elixir Phosphorus (728), 8 fl.ounces.
 Elixir Phosphate of Iron, Quinine and
 Strychnine (726), 8 fl.ounces.

Mix them.

A fl.drachm contains 1 grain Iron, $\frac{1}{2}$ grain Quinine, $\frac{1}{80}$ grain Strychnine, and $\frac{1}{200}$ grain of Phosphorus. The dose is a teaspoonful to a dessertspoonful.

731. Elixir Pink Root Compound.

Pink Root, in coarse powder,	2	ounces av.
Senna Leaves, in coarse powder,	1	ounce av.
Balmony,	$\frac{1}{2}$	ounce av.
Elixir Percolating Menstruum, q. s., about	18	fl.ounces.
Sugar,	5	ounces av.
Soluble Elixir Flavoring,	1	fl.ounce.

Make by percolation as directed (512).

A fl.drachm represents about 7 grains Pink Root, $3\frac{1}{2}$ grains Senna, and 2 grains Balmony.

This is an excellent preparation for worms, and is given in doses of a teaspoonful or more.

732. Elixir Propylamine.

Propylamine (liquid),	64	minims.
Elixir,	1	pint.

Mix them. The dose is a tablespoonful, containing 2 minims of Propylamine.

Elixir Chloride of Propylamine is made by dissolving 384 grains of Chloride of Propylamine in a pint of Elixir. A fl.drachm contains 3 grains of the salt. The dose is a teaspoonful.

733. Elixir "Protoxide" of Iron.

Solution "Protoxide" of Iron,	2	fl.ounces.
Elixir,	14	fl.ounces.

Mix them. A fl.drachm contains 2 grains Protocitrate of Iron. The dose is a teaspoonful to a dessertspoonful.

734. Elixir Protoxide of Iron and Iodide of Calcium.

Iodide of Calcium,	128	grains.
Elixir Protoxide of Iron (733),	1	pint.

Dissolve the salt in the Elixir.

A fl.drachm contains 2 grains Protocitrate of Iron, and 1 grain Iodide of Calcium. The dose is a teaspoonful.

735. Elixir Protoxide of Iron and Iodide of Potassium.

Iodide of Potassium, 384 grains.
Elixir Protoxide of Iron (733), 1 pint.

Dissolve the salt in the Elixir.

A fl.drachm contains 2 grains Protocitrate of Iron and 3 grains Iodide of Potassium. The dose is a teaspoonful.

736. Elixir Protoxide of Iron and Quinine.

Sulphate of Quinine, 128 grains.
Elixir Protoxide of Iron (733), 1 pint.

Dissolve the Quinine salt by rubbing with separate portions of the Elixir, and filter.

A fl.drachm contains 2 grains of Protocitrate of Iron and 1 grain of Quinine. The dose is a teaspoonful.

737. Elixir Protoxide of Iron, Quinine and Strychnine.

Sulphate of Strychnine, 1½ grain.
Elixir Protoxide of Iron and Quinine, 1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, or add 1½ fl.drachm of Solution Strychnine to a pint of the Elixir.

738. Elixir Pyrophosphate of Iron.

Ferro-phosphated Cordial Elixir.

Pyrophosphate of Iron, 256 grains.
Water, 1 fl.ounce.
Elixir, 15 fl.ounces.

Dissolve the Pyrophosphate of Iron in the Water by the aid of heat and add the Elixir. After standing, filter.

A fl.drachm contains 2 grains of the Iron salt.

739. Elixir Pyrophosphate of Iron and Quinine. (Neutral.)

Sulphate of Quinine,	64 grains.
Citric Acid,	10 grains.
Pyrophosphate of Iron,	128 grains.
Water of Ammonia, q. s.,	20 to 30 drops.
Water,	1 fl.ounce.
Elixir,	15 fl.ounces.

Dissolve the Citric Acid in a portion of the Elixir and rub the Quinine salt in a mortar with the solution, then add the remainder of the Elixir and warm the mixture gently by a water-bath until the salt is entirely dissolved; dissolve the Iron salt by the aid of heat in the water, and add to the solution 20 drops of 10 per cent. Water of Ammonia, then add the Quinine solution to the Iron solution and mix them thoroughly. When cool, filter. If the Elixir, when cool, remains cloudy, add a few drops more of Water of Ammonia to make clear.

A fl.drachm contains 1 grain of the Iron salt and $\frac{1}{2}$ grain Quinine. The dose is a teaspoonful to a dessertspoonful.

This Elixir was formerly prescribed and sold as *Elixir Phosphate of Iron and Quinine*, but since the introduction of a soluble scale Phosphate of Iron the Elixir No. 725 is now furnished by that name.

740. Elixir Pyrophosphate of Iron, Quinine and Strychnine. (Neutral.)

Sulphate of Strychnine,	2 grains.
Elixir Pyrophosphate of Iron and Quinine,	1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add 2 fl.drachms of solution of Strychnine to a pint of Elixir of Pyrophosphate of Iron and Quinine. It may also be made the same as directed for the preceding formula by adding to the solution of Citric Acid in Elixir 2 grains of Sulphate of Strychnine before adding the Quinine salt.

A fl.drachm contains 1 grain of the Iron salt, $\frac{1}{2}$ grain Quinine, and $\frac{1}{64}$ grain Strychnine. The dose is a teaspoonful or more.

This Elixir was formerly called *Elixir Phosphate of Iron, Quinine and Strychnine*, as explained in the foregoing formula.

Elixirs of Pyrophosphate of Iron and Cinchonidine, with their various combinations, are made in the same manner as Elixirs Pyrophosphate of Iron and Quinine, only using Sulphate of Cinchonidine instead of Sulphate of Quinine.

A great variety of combinations are made with Elixir Pyrophosphate of Iron, Quinine, and Strychnine. It is unnecessary to give detailed formulæ for them as they are made simply by adding various salts and solutions to the Elixir.

741. Elixir Pyrophosphate of Iron and Quinine.

The foregoing Elixirs of Pyrophosphate of Iron and Quinine being neutral cannot be made to hold much more than $\frac{1}{2}$ grain of Quinine in a fl.drachm in solution. The following formula is made to contain 1 grain in a fl.drachm:

Sulphate of Quinine,	128 grains.
Phosphoric Acid, 50 per cent., 1880, .	1 fl.drachm.
Alcohol,	1 fl.ounce.
Pyrophosphate of Iron,	256 grains.
Water,	1 fl.ounce.
Water of Ammonia, q. s., about . . .	20 minims.
Elixir sufficient to make	1 pint.

Dissolve the Quinine Salt in 8 ounces of the Elixir, the Alcohol, and the Phosphoric Acid. Dissolve the Pyrophosphate of Iron in 1 ounce of Water by the aid of heat and add to the solution 6 ounces of Elixir and 20 minims Water of Ammonia. When the two solutions, the Quinine in one and the Iron in the other, are ready add the one containing the Quinine very gradually to the one containing the Iron, giving time for the precipitate formed to be dissolved after adding each portion before adding more. If not clear when all is

added, add enough Water of Ammonia, mixed with a little Elixir to make clear, and filter.

A fl.drachm contains 2 grains of the Iron salt and 1 grain Quinine. The dose is a teaspoonful.

742. Elixir Pyrophosphate of Iron, Quinine and Arsenic.

Fowler's Solution of Arsenic, . . . 256 minims.

Elixir Pyrophosphate of Iron and

Quinine (741), . . . 14½ fl.ounces.

Mix them.

A fl.drachm contains 2 grains Iron, 1 grain Quinine, and 2 minims Fowler's Solution.

743. Elixir Pyrophosphate of Iron, Quinine, and Strychnine.

Sulphate of Strychnine, . . . 2 grains.

Elixir Pyrophosphate of Iron and Quinine, 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, or add 2 fl.drachms solution of Strychnine to a pint of Elixir.

A fl.drachm contains 2 grains of the Iron salt, 1 grain Quinine, and $\frac{1}{64}$ grain Strychnine.

744. Elixir Quinine.

Sulphate of Quinine, . . . 128 grains.

Sulphuric Acid, q. s., about . . . 10 minims.

Elixir, . . . 1 pint.

Water of Ammonia, q. s., about . . . 10 minims.

Rub the Quinine salt to a powder and then with the Elixir to a smooth mixture, add Sulphuric Acid drop by drop until, after standing, the Quinine is entirely dissolved, then add a few drops of Water of Ammonia until the blue fluorescence of the solution has mostly disappeared. Filter.

A fl.drachm contains 1 grain of the Quinine salt. The dose is a teaspoonful to a tablespoonful.

745. Elixir Quinine, Bismuth and Pepsin.

Elixir Quinine (744), 8 fl.ounces.

Elixir Pepsin and Bismuth (709), . . . 8 fl.ounces.

Mix them, and if any cloudiness occurs add Water of Ammonia drop by drop to clear.

A fl.drachm contains $\frac{1}{2}$ grain Quinine, $\frac{1}{2}$ grain Bismuth, and 1 grain Pepsin. The dose is a teaspoonful to a dessert-spoonful.

746. Elixir Quinine, Bismuth and Strychnine.

Elixir Quinine (744), 8 fl.ounces.

Elixir Bismuth and Strychnine (539), . . 8 fl.ounces.

Mix them, and, if necessary, add a few drops of Water of Ammonia to make clear.

A fl.drachm contains $\frac{1}{2}$ grain Quinine, $\frac{1}{2}$ grain Bismuth, and $\frac{1}{128}$ grain Strychnine.

747. Elixir Quinine Bisulphate.

Bisulphate of Quinine, 128 grains.

Elixir, 1 pint.

Rub the Quinine salt with the Elixir until dissolved, and filter. A fl.drachm contains 1 grain Bisulphate of Quinine. The dose is a teaspoonful to a tablespoonful.

748. Elixir Quinine Phosphate.

Sulphate of Quinine, 128 grains.

Phosphoric Acid, 50 per cent. (1880), . . 1 fl.drachm.

Elixir, 1 pint.

Rub the Quinine salt to a fine powder and then to a smooth mixture with the Elixir, add the Phosphoric Acid, dissolve and filter.

A fl.drachm contains 1 grain of the Quinine salt. The dose is a teaspoonful or more.

Other combinations of Quinine with Elixirs will be found under other headings.

749. Elixir Rhubarb.

Rhubarb, in coarse powder, 1½ ounce av.
 Elixir Percolating Menstruum, q. s., about 1 pint.
 Sugar, 5 ounces av.
 Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). This may also be made by mixing 1½ ounce Fluid Extract of Rhubarb with enough Elixir to make a pint.

A fl.drachm represents about 5 grains of Rhubarb. The dose is a teaspoonful to a tablespoonful.

750. Elixir Rhubarb and Columbo.

Fluid Extract of Columbo, 256 minims.
 Fluid Extract of Rhubarb, 256 minims.
 Elixir, sufficient to make 1 pint.

Mix, and after standing, filter.

This may also be made by percolating Rhubarb and Columbo, each 256 grains, with Elixir Percolating Menstruum, 1 pint, adding 5 ounces sugar and 1 ounce Soluble Flavoring, and filtering.

A fl.drachm represents 2 grains each, Rhubarb and Columbo. The dose is a teaspoonful to a dessertspoonful.

751. Elixir Rhubarb, Columbo, and Iron.

Phosphate of Iron, in scales, 128 grains.
 Elixir Rhubarb and Columbo, 1 pint.
 Water, 1 fl.ounce.

Mix the Elixir with the white of one egg, and let stand for two days, with occasional agitation, then filter through cloth. Dissolve the Iron salt in water, by the aid of heat, and add to the detannated Elixir; after standing a few days, filter.

A fl.drachm represents 2 grains each, Rhubarb and Columbo, and 1 grain Phosphate of Iron. The dose is a teaspoonful to a dessertspoonful.

752. Elixir Rhubarb and Magnesia.

Two Elixirs of Rhubarb and Magnesia are used, one containing sulphate of Magnesium (Epsom Salt) and the other Citrate of Magnesium in solution. The former is probably most used, but the latter is by far the more elegant preparation.

MADE WITH SULPHATE OF MAGNESIUM.

Sulphate of Magnesium (Epsom Salt), . . . 640 grains.

Elixir Rhubarb (749), 15 fl.ounces.

Rub the salts with the Elixir until dissolved. The dose is a dessertspoonful to a tablespoonful.

MADE WITH CITRATE OF MAGNESIUM.

Citric Acid, 3 drachms.

Carbonate of Magnesium, 2 drachms.

Water, 1 fl.ounce.

Elixir Rhubarb (749), 15 fl.ounces.

Rub the Carbonate of Magnesium with the Water and gradually add the Citric Acid. When effervescence has ceased add the Elixir Rhubarb, and mix thoroughly. The dose is a dessertspoonful or more.

753. Elixir Rhubarb and Potassium.

Neutralizing Elixir.

Rhubarb, in coarse powder, 160 grains.

Bicarbonate of Potassium, 160 grains.

Cinnamon, 80 grains.

Golden Seal, 80 grains.

Elixir Percolating Menstruum, 1 pint.

Sugar, 5 ounces av.

Spirit of Peppermint, 2 fl.drachms.

Mix all together and macerate for several days, with occasional agitation, then filter, adding enough Elixir through the filter to make a pint. In making larger quantities of this Elixir it is best made by percolation as directed (512).

This is the same strength as the "Neutralizing Cordial" of the American Dispensatory. The dose is a dessertspoonful to a tablespoonful.

754. Elixir Rubrum.*Red Elixir.*

As understood in American Pharmacy, *Red Elixir* is Simple Elixir colored red with carmine coloring, cochineal or cudbear. The Simple Elixir is often designated as *Elixir Album* or *White Elixir*. Red Elixir may be used as a base for Elixirs desired to be colored red, but in the formulas in this work the coloring is directed to be added to the Elixir when made.

755. Elixir Salicin.

Salicin,	256 grains.
Elixir,	1 pint.

Rub the Salicin to a smooth mixture with the Elixir and heat by means of a water-bath until the salt is dissolved.

A fl.drachm contains 2 grains of Salicin. The dose is a teaspoonful to a dessertspoonful.

756. Elixir Salicylate of Propylamine.

Salicylic Acid,	1 ounce av.
Propylamine (liquid),	2 fl.drachms.
Alcohol,	3 fl.ounces.
Elixir, sufficient to make	1 pint.

Rub the Salicylic Acid with the Alcohol and Elixir and add the Propylamine, then, when dissolved, add the Elixir, and filter.

A fl.drachm contains about 4 grains Salicylic Acid and 1 minim Propylamine, equivalent to 5 grains of the Salicylate of Propylamine. The dose is a teaspoonful for rheumatic troubles.

757. Elixir Salicylate of Sodium.

Salicylate of Sodium,	640 grains.
Elixir, sufficient to make	1 pint.

Dissolve the salt in the Elixir, and filter. This Elixir may also be made by mixing 400 grains of Salicylic Acid with 300

grains of Bicarbonate of Sodium and dissolving the mixture in a pint of Elixir in a capacious vessel. When effervescence is over, filter.

A fl.drachm contains 5 grains Salicylate of Sodium. The dose is a teaspoonful to a dessertspoonful or more for rheumatic affections.

758. Elixir Salicylic Acid.

Salicylic Acid,	256 grains.
Alcohol,	3 fl.ounces.
Elixir, sufficient to make	1 pint.

Dissolve the Acid in the Alcohol, and gradually add the Elixir.

A fl.drachm contains 2 grains Salicylic Acid. The dose is a teaspoonful to a dessertspoonful or more.

759. Elixir Santonin.

Santonin, in very fine powder,	64 grains.
Alcohol,	2 fl.ounces.
Elixir,	14 fl.ounces.

Rub the Santonin with the Alcohol, and heat gently by water-bath until dissolved, then add the Elixir.

A fl.drachm contains $\frac{1}{2}$ grain Santonin. The dose is a teaspoonful to a dessertspoonful. As Santonin is quite insoluble, and it is not desirable to have it dissolved when taken as a vermifuge, it is best given in the form of an emulsion, or suspended in syrup or in powders.

760. Elixir Sarsaparilla Compound.

Fluid Extract Sarsaparilla Compound,	4 fl.ounces.
Elixir,	12 fl.ounces.

Mix them. This Elixir may also be made from the drugs directed for making 1 pint Fluid Extract Sarsaparilla Compound by percolating the ingredients as directed under Fluid Extract of Sarsaparilla Compound with Elixir Percolating Menstruum

sufficient to make 52 fl.ounces, adding 20 ounces of Sugar and 4 fl.ounces soluble flavoring to make 4 pints of Elixir.

This is of the same strength as Syrup Sarsaparilla Compound. The dose is a dessertspoonful or more.

761. Elixir Scilla Compound.

Elixir Squill Compound.

Squill, in coarse powder,	640 grains.
Senega, in coarse powder,	640 grains.
Tartrate of Antimony and Potassium, . .	16 grains.
Elixir Percolating Menstruum, q. s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512.) This is the same strength as Syrup of Squill Compound. The dose is $\frac{1}{4}$ to one teaspoonful or more.

762. Elixir Senna.

Fluid Extract of Senna,	2 $\frac{3}{4}$ fl.ounces.
Elixir, sufficient to make	1 pint.

Mix, and, after standing, filter.

A fl.drachm represents 10 grains of Senna. Dose, a dessertspoonful to a tablespoonful as a laxative.

763. Elixir Senna Compound.

Senna Leaves, in coarse powder,	2 ounces av.
Rhubarb, in coarse powder,	1 ounce av.
Jalap, in coarse powder,	$\frac{1}{2}$ ounce av.
Mandrake, in coarse powder,	$\frac{1}{2}$ ounce av.
Elixir Percolating Menstruum, q. s., about	18 fl.ounces.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512). The dose is a teaspoonful to a dessertspoonful as a laxative, a tablespoonful as a cathartic.

764. Elixir Stillingia.

Fluid Extract Stillingia,	23 $\frac{3}{4}$ ounces av.
Alcohol,	2 fl.ounces.
Elixir, sufficient to make	1 pint.

Mix them, and, after standing, filter. This may also be made by percolating 23 $\frac{3}{4}$ ounces Stillingia with 2 ounces Alcohol and 14 ounces Percolating Menstruum, adding 5 ounces of Sugar and 1 ounce Soluble Flavoring.

A fl.drachm represents 10 grains Stillingia. The dose is a teaspoonful or more.

765. Elixir Stillingia Compound.

Fluid Extract Stillingia Compound,	4 fl.ounces.
Elixir,	12 fl.ounces.

Mix them, and, after standing, filter. This may also be made by percolating the drugs as directed for making 1 pint Fluid Extract of Stillingia Compound with Elixir Percolating Menstruum until 52 fl.ounces have passed, then dissolving 20 ounces av. of Sugar in the percolate and adding 4 fl.ounces Soluble Flavoring to make 4 pints Elixir. This is the same strength as Syrup Stillingia Compound. The dose is a teaspoonful to a dessertspoonful.

766. Elixir Strychnine.

Sulphate of Strychnine,	4 grains.
Elixir,	1 pint.

Dissolve the Strychnine by rubbing with separate portions of the Elixir, adding a few drops of dilute Sulphuric Acid, or add 4 fl.drachms Solution Strychnine to a pint of Elixir and filter.

A fl.drachm contains $\frac{1}{32}$ grain Strychnine. The dose is from $\frac{1}{2}$ to a teaspoonful.

This Elixir is also made containing only 2 grains in a pint, or $\frac{1}{64}$ grain in a fl.drachm.

767. Elixir Sumbul.*Elixir of Musk Root.*

Sumbul, or Musk Root,	1280 grains.
Elixir Percolating Menstruum, q. s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), or mix $2\frac{3}{4}$ fl.ounces of Fluid Extract of Sumbul with enough Elixir to make a pint and filter.

A fl.drachm represents 10 grains of Sumbul. The dose is a teaspoonful to a dessertspoonful.

768. Elixir Sumbul Compound.*Compound Elixir of Musk Root.*

Valerianate of Ammonium,	128 grains.
Elixir Sumbul (767),	1 pint.

Dissolve the salt in the Elixir and filter.

A fl.drachm contains 10 grains Musk Root and 1 grain Valerianate of Ammonium. The dose is a teaspoonful to a dessertspoonful as a nervine. This Elixir is also called *Elixir Sumbul* and *Valerianate of Ammonium*.

769. Elixir Svapnia.

Svapnia,	128 grains.
Elixir,	1 pint.

Rub the Svapnia to a powder, and with the Elixir until dissolved and filter. A fl.drachm contains 1 grain Svapnia. The dose is a teaspoonful.

770. Elixir Taraxacum Compound.

The formulas for this Elixir are given under the heading *Elixir Dandelion Compound* (626), which see. The formula was first given for this Elixir by Prof. P. C. Candidus of Mobile,

and as this particular formula is still frequently called for, it is here repeated in substance :

Dandelion Root,	I ounce av.
Wild Cherry Bark,	$\frac{3}{4}$ ounce av.
Gentian Root,	$\frac{1}{8}$ ounce av.
Bitter Orange Peel,	$\frac{1}{4}$ ounce av.
Cinnamon,	$\frac{1}{8}$ ounce av.
Liquorice Root,	$\frac{1}{2}$ ounce av.
Star Anise,	30 grains.
Caraway Seed,	30 grains.
Coriander Seed,	30 grains.
Elixir Percolating Menstruum, q.s., about	18 fl.ounces
Sugar,	5 ounces av.

Grind the drugs to a coarse powder, and make by percolation as directed (512). This Elixir is used as a vehicle for Quinine, and as an addition to other medicines. Also as a laxative and tonic in doses of a dessertspoonful or more.

771. Elixir Tartrate of Antimony and Potassium.

Elixir Tartar Emetic.

Tartrate of Antimony and Potassium,	16 grains.
Elixir,	1 pint.

Dissolve the salt by rubbing with separate portions of the Elixir, and filter.

A fl.drachm contains $\frac{1}{8}$ grain Tartar Emetic. The dose is a teaspoonful to a dessertspoonful. This Elixir is a very convenient form in which to exhibit this salt, as the dose may be regulated as desired.

772. Elixir Valerian.

Valerian Root, in coarse powder, . . .	1280 grains.
Elixir Percolating Menstruum, q. s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512). This may also be made by mixing $2\frac{3}{4}$ fl.ounces Fluid Extract Valerian with enough Elixir to make a pint, and, after standing, filtering.

A fl.drachm represents 10 grains Valerian. The dose is a teaspoonful to a dessertspoonful or more.

773. Elixir Valerianate of Ammonium.

Valerianate of Ammonium,	256 grains.
Water of Ammonia, 10 per ct., q.s., about	$1\frac{1}{2}$ fl.drachm.
Elixir,	14 fl.ounces.
Syrup,	$1\frac{1}{2}$ fl.ounce.

Dissolve the Valerianate in the Elixir, and add Water of Ammonia to neutralize the solution, then add the Syrup, and color with Carmine solution or other red coloring.

A fl.drachm contains 2 grains of the salt. The dose is a teaspoonful to a dessertspoonful or more as an anodyne, nerve, and hypnotic. The object of adding the Water of Ammonia is to neutralize the free acid of the Valerianate of Ammonium, which is always present. The quantity specified is generally about right, but it may be tested with test-paper for excess of acid and made just right. This formula makes the preparation usually used, but some houses furnish an Elixir containing Fluid Extract of Valerian 1 fl.ounce in each pint in addition to the above formula. Such an Elixir may be readily made if desired by adding 1 fl.ounce Fluid Extract Valerian, and filtering. It is thought to be more effective when thus made.

774. Elixir Valerianate of Ammonium with Chloral Hydrate.

Hydrate of Chloral, crystallized, . . .	640 grains.
Elixir Valerianate of Ammonium, sufficient to make	1 pint.

Dissolve the Chloral in the Elixir.

A fl.drachm contains 5 grains Hydrate of Chloral combined with the Elixir. The dose is a teaspoonful to a dessertspoonful or more as a hypnotic and anodyne.

775. Elixir Valerianate of Ammonium and Iron.

Pyrophosphate of Iron,	128 grains.
Water,	1 fl.ounce.
Elixir Valerianate of Ammonium, . .	15 fl.ounces.

Dissolve the Iron salt in the Water by the aid of heat, and add the Elixir.

A fl.drachm contains 1 grain of Iron and 2 grains Valerianate of Ammonium. The dose is a teaspoonful to a dessert-spoonful. Other Salts of Iron may be added to the Elixir Valerianate of Ammonium in the same way.

776. Elixir Valerianate of Ammonium and Morphine.

Morphine Sulphate,	16 grains.
Elixir Valerianate of Ammonium, . .	1 pint.

Dissolve the Morphine salt in the Elixir.

A fl.drachm contains 2 grains Valerianate of Ammonium and 18 grain Morphine. The dose is a teaspoonful. This is one of the most desirable combinations as a hypnotic and anodyne.

777. Elixir Valerianate of Ammonium and Quinine.

Sulphate of Quinine,	64 grains.
Valerianate of Ammonium,	256 grains.
Water of Ammonia, about	20 minims.
Elixir, sufficient to make	1 pint.

Rub the Quinine salt to a smooth mixture with the Elixir, and add the Valerianate. When the Quinine is entirely dissolved add the Water of Ammonia. This may be colored with a little Carmine coloring if desired.

A fl.drachm contains 2 grains Valerianate of Ammonium and $\frac{1}{2}$ grain of Quinine. The dose is a teaspoonful to a dessert-spoonful or more. A great variety of combinations may be made with this Elixir by adding other salts, as Strychnine, Iron, etc.

778. Elixir Valerianate of Ammonium and Strychnine.

Sulphate of Strychnine, 2 grains.

Elixir Valerianate of Ammonium, 1 pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Elixir, and filter, or add 2 fl.drachms of Solution of Strychnine to a pint of the Elixir.

A fl.drachm contains 2 grains Valerianate of Ammonium and $\frac{1}{64}$ grain Strychnine. The dose is a teaspoonful.

An Elixir is also made containing double the quantity of Strychnine, or 4 grains to a fl.drachm.

779. Elixir Valerianate of Iron.

An Elixir of Valerianate of Iron may be made by dissolving 128 grains Valerianate of Iron, 60 grains of Citric Acid, and 60 grains Citrate of Potassium in a pint of Elixir; but it is more expensive and less satisfactory than the Elixir Valerianate of Ammonium and Iron (775), which is therapeutically the same.

780. Elixir Valeriate of Morphine.

Valerianate of Morphine, 16 grains.

Elixir, 1 pint.

Dissolve the salt by rubbing with separate portions of the Elixir.

A fl.drachm contains $\frac{1}{8}$ grain Valerianate of Morphine. The dose is a teaspoonful.

781. Elixir Valerianate of Quinine.

Valerianate of Quinine, 64 grains.

Citric Acid, 10 grains.

Elixir, 1 pint.

Dissolve the Valerianate by rubbing to a fine powder, adding the Citric Acid and then rubbing with the Elixir.

A fl.drachm contains $\frac{1}{2}$ grain Valerianate of Quinine. The dose is a teaspoonful to a dessertspoonful.

782. Elixir Valerianate of Strychnine.

Valerianate of Strychnine, 2 grains.
 Elixir, 1 pint.

Rub the Strychnine salt with separate portions of the Elixir until dissolved.

A fl.drachm contains $\frac{1}{64}$ grains Strychnine Valerianate.
 Dose, a teaspoonful.

This Elixir is also made double the strength, or 4 grains Strychnine Valerianate in a pint.

783. Elixir Valerianate of Zinc.

Valerianate of Zinc, 64 grains.
 Elixir, 1 pint.

Dissolve the salt by rubbing with the Elixir.

A fl.drachm contains $\frac{1}{2}$ grain Valerianate of Zinc. The dose is a teaspoonful or more.

784. Elixir Veratrum Viride.

American Hellebore, in fine powder, . . . 256 grains.
 Elixir, 1 pint.

Macerate for five days, and filter. This may also be made by adding 256 minims of Fl. Ext. Veratrum Viride to enough Elixir to make a pint.

A fl.drachm represents 2 grains Veratrum Viride. The dose is $\frac{1}{2}$ to 1 teaspoonful.

785. Elixir Wild Cherry.

Wild Cherry Bark, in coarse powder, . . . 23 $\frac{1}{4}$ ounces av.
 Elixir Percolating Menstruum, q. s., about 1 pint.
 Sugar, 5 ounces av.
 Soluble Elixir Flavoring, 1 fl.ounce.

Make by percolation as directed (512). This may also be made by mixing 23 $\frac{1}{4}$ fl.ounces of Fl. Ext. of Wild Cherry with enough Elixir to make a pint.

A fl.drachm represents 10 grains of Wild Cherry. The dose is a teaspoonful or two.

786. Elixir Wild Cherry, Detannated.

Wild Cherry Bark, in coarse powder, .	23 $\frac{3}{4}$ ounces av.
Elixir Percolating Menstruum, q. s.,	
about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512), and detannate with Ferric Hydrate as directed (515).

This Elixir is used with solutions of Iron salts, Bismuth, etc., that would form inky colors or precipitates with the former formula.

Elixir Wild Cherry, from Cherry Pits.

An Elixir may be made from Cherry Pits, which does not need to be detannated to combine with Iron, etc., by macerating 2 ounces of Cherry Pits, crushed, with a pint of Elixir, for several days, and filtering.

787. Elixir Wild Cherry, Ferrated.

Citrate of Iron and Ammonium, . . .	128 grains.
Elixir Wild Cherry, Detannated (786), .	1 pint.

Dissolve the Iron salt by rubbing with separate portions of the Elixir.

A fl.drachm represents 10 grains of Wild Cherry and 1 grain of Citrate of Iron. The dose is a teaspoonful to a dessert-spoonful.

788. Elixir Wild Cherry, Ferriphosphated.

Phosphate of Iron, in scales (1880) . .	128 grains.
Water,	1 fl.ounce.
Elixir Wild Cherry, Detannated (786), .	15 fl.ounces.

Dissolve the Iron salt in the water by the aid of heat and add the Elixir to the solution.

A fl.drachm represents 10 grains of Wild Cherry and 1 grain Phosphate of Iron. Dose, a teaspoonful to a dessert-spoonful.

789. Elixir Wild Cherry Ferrophosphorated.

Pyrophosphate of Iron,	128 grains.
Water,	1 fl.ounce.
Elixir Wild Cherry, detannated (786),	15 fl.ounces.

Dissolve the Iron salt in the Water, by the aid of heat, and add the Elixir to the solution.

A fl.drachm represents 10 grains Wild Cherry and 1 grain Pyrophosphate of Iron. Dose, a teaspoonful to a dessert-spoonful.

The Elixirs of Wild Cherry and Iron may be combined with Bismuth, Strychnine, and other soluble salts which are compatible with it.

790. Elixir Wild Cherry Compound.

Wild Cherry Bark,	1 ounce av.
Liquorice Root,	$\frac{1}{2}$ ounce av.
Marshmallow Root,	$\frac{1}{2}$ ounce av.
Elixir Percolating Menstruum, q. s., about	1 pint.
Sugar,	5 ounces av.
Soluble Elixir Flavoring,	1 fl.ounce.

Make by percolation as directed (512).

This Elixir is used chiefly as a vehicle for Quinine, for which it is excellent. It may be made by maceration instead of percolation if desired.

791. Elixir Yerba Santa.

Fluid Extract Yerba Santa,	$2\frac{3}{4}$ fl.ounces.
Alcohol,	2 fl.ounces.
Elixir, sufficient to make	1 pint.

Mix, and, after standing, filter.

A fl.drachm represents 10 grains Yerba Santa. The dose is a teaspoonful or more.

792. Elixir Yerba Santa Compound.

The following formula is adopted from the original, first published by Mr. J. S. McClary, of Los Angeles, Cal., who first brought to notice the advantages of Yerba Santa as a carrier for Quinine:

Yerba Santa,	6	ounces av.
Orange Peel,	2	ounces av.
Cinnamon Bark,	}	of each, 3 drachms.
Cloves,		
Cardamom Seeds,	}	of each, 2 drachms.
Coriander Seed,		
Caraway Seed,		
Anise Seed,		
Cochineal,		
Glycerin,	1	pint.
Alcohol,	$\frac{1}{2}$	pint.
Sugar,	4	pounds av.
Water, sufficient to make	1	gallon.

Powder the drugs coarsely, and, having mixed the Alcohol and Glycerin, moisten the powder and pack in the percolator, adding Water through the percolator, and continuing the percolation until 6 pints of percolate are obtained. In this dissolve the Sugar by gentle heat, and strain.

This Elixir is used mainly to disguise the taste of Quinine and other bitter medicines.

Other Elixirs.

In the first part of this article, page 275, it was explained that Elixirs, as understood in American Pharmacy, were flavored, sweetened, weakly alcoholic preparations, in which medicinal substances are exhibited in pleasant, palatable form, etc. The foregoing formulæ have corresponded to this description, but there are many preparations which have been known in the past as "Elixirs," which are not of this class, and which could not properly be included with it. The formulæ for such

of these as are most important, or likely to be called for, are therefore given here. Many of them have been official in foreign Pharmacopæias :

793. Acid Elixirs — *Dippell's*.— Sulphuric acid 1 part (by weight), alcohol 5 parts; drop the acid gradually into the alcohol and macerate with 1 part cochineal and 1 part saffron.

Haller's.— Equal parts by weight of Sulphuric Acid and alcohol. See page 73.

Vogler's.— Equal parts by weight of Sulphuric Ether and nitrous ether.

794. Aloes Elixirs.— *Compound Tincture of Aloes*.— Acetate of potassium, inspissated oxgall, Socotrine Aloes, myrrh each 120 grains, hay saffron 60 grains, brandy or proof spirit $2\frac{1}{2}$ fl.ounces; digest seven days and strain. Several other preparations are also known as Elixirs of Aloes. Tincture of Aloes and myrrh is sometimes known as Elixir Aloes Compound.

795. Elixir Amarum.— *Bitter Elixir*.— The present German Pharmacopœia gives the following formula: Extract of wormwood 10 parts, oleo-saccharate of peppermint 5 parts, dissolve by triturating with water 25 parts, then add aromatic tincture 5 parts, bitter tincture 5 parts.

796. Anti-Asthmatic Elixirs.— Oil of anise, camphor, balsam of tolu each 1 ounce, cochineal 1 drachm, proof spirit 1 gallon; digest seven days and filter.

Boerhaave's.— Anise seed, asarabacca, elecampane, liquorice root, orris root, and sweet flag root of each 1 part, proof spirit 5 parts; macerate and filter.

797. Elixir Antigoutteux de Villette.— *Gout Elixir*.— Cinchona bark 4 parts, poppy petals 2 parts, sassafras 1 part, guaiacum 2 parts, rum 160 parts, syrup sarsaparilla 100 parts; macerate and filter.

798. Boerhaave's Visceral Elixir.— Aloes, myrrh, and saffron, of each 1 ounce, tartrate of potassium 2 ounces, alcohol 14 fl.ounces, water 1 ounce; macerate three days and filter.

799. Claude's Elixir.— (Pideret).— Salt of tartar, chloride of ammonium, aloes, and myrrh, each 1 ounce, elder flower water 25 fl.ounces; digest with agitation for 24 hours and filter.

(Parish).— Carbonate of potassium 1 ounce, aloes, guaiacum, myrrh, saffron, and rhubarb of each 2 drachms, water 18 fl.ounces; macerate a few days and decant.

800. Elixir Deslaurier's. — *Toni-febrifuge, au Quinquina et Caffé*.— Yellow cinchona bark $2\frac{1}{2}$ ounces, brown cinchona bark 1 ounce, coffee slightly roasted 2 ounces, sugar $12\frac{1}{2}$ ounces, sherry wine 2 pints, citric acid 150 grains; powder the drugs, macerate seven days, filter, and dissolve the sugar in the filtrate.

801. Elixir Carminative, Dalby's.— Tincture of Opium $2\frac{1}{4}$ fl.ounces, tincture asafetida $1\frac{1}{4}$ fl.ounce, essence of caraway $\frac{1}{2}$ ounce, essence of pep-

permint 1 ounce, calcined magnesia $\frac{1}{2}$ ounce, tincture of castor $3\frac{1}{4}$ ounces, alcohol 4 fl.ounces, syrup 30 fl.ounces; mix.

802. Elixir de Garus.— Myrrh 90 grains, aloes 90 grains, cloves 180 grains, nutmeg 180 grains, saffron 480 grains, cinnamon 360 grains, alcohol 12 pints; reduce the drugs to a coarse powder, macerate with the alcohol and distill 9 pints, which reserve; then take maidenhair 4 tr.ounces, liquorice root $\frac{1}{2}$ tr.ounce, figs 3 tr.ounces; infuse in 8 pints boiling water, strain, express, and dissolve in the liquid 12 pounds av. of sugar; mix equal parts by weight of the syrup thus prepared with the distilled spirit reserved.

803. Elixir of Gold.— Terchloride of Gold 20 grains, alcohol 6 fl.drachms, ether 3 fl.drachms.

Dr. De la Motte's Golden Drops are also furnished under the name Elixir of Gold; chloride of iron 1 part, alcohol 3 parts, ether 3 parts.

804. Elixir of Long Life.— *Compound Tincture of Aloes* (Codex).— Aloes 8 parts, gentian, rhubarb, zedoary, saffron, agaric, opium each 1 part, alcohol 400 parts; macerate and filter.

805. Elixir Pectoral.— Balsam tolu 2 ounces, benzoin $1\frac{1}{2}$ ounce, saffron $\frac{1}{2}$ ounce, alcohol 32 fl.ounces; digest by gentle heat for four days and filter.

The German Pharmacopœia, 1883, gives the following under the name of *Burstelixir* or *Pectoral Elixir* (Elixir E Succo Liquiritiæ): Purified extract of liquorice 10 parts, dissolved in fennel water 30 parts, and added to anisated spirit of ammonia 10 parts; after standing the liquid is poured off from the sediment.

806. Elixir Salutis.— *Elixir of Health, Duffy's Elixir.*— This Elixir was formerly official under the title Tincture Senna Compound. Many formulas for it are extant. The following is from the Edinburgh Dispensatory: Senna 2 tr.ounces, jalap 1 tr.ounce, coriander $\frac{1}{2}$ tr.ounce, diluted alcohol $3\frac{1}{2}$ pints; macerate and filter. To this 1 pound of sugar and other aromatics may be added if desired.

807. Elixir Stoughton's.— (Codex.) Aloes and cascarilla of each 1 drachm, rhubarb 3 drachms, gentian, germander, wormwood, and bitter orange peel of each 5 drachms, alcohol 60° proof 2 pints; macerate and filter.

808. Elixir Tonic.— A number of old preparations are known by this name, as *Elixir Roborans* or *Tincture Crown Bark*, for which compound tincture of cinchona may be dispensed if called for.

Elixir Tonique Antiglaireux de Guillie.— A stomach tonic for diarrhœa, composed of a great number of drugs, etc.

809. Elixir Visceral, Hoffman's.— *Elixir Orange Compound* of the German Pharmacopœia. Orange peel cut 50 parts, cinnamon bruised 10 parts, carbonate of potassium $2\frac{1}{2}$ parts, sherry wine 250 parts; macerate for eight days and express; add sherry wine to make 230 parts, and dissolve in the liquid extracts of gentian, wormwood, buckbean, and cascarilla each 5 parts; allow the mixture to settle, then filter. See, also, Boerhaave's Visceral Elixir.

Besides the Elixirs of this kind which are here mentioned, are several which are official in the U. S. P., under other names, as Elixir Proprietatis (Tincture Aloes and Myrrh), Elixir Vitriol (Aromatic Sulphuric Acid), McMunn's Elixir of Opium (Deoderized Tincture of Opium), etc. There are also many which are not of sufficient general importance to require a formula for their preparation. They may usually be prepared as wanted by intelligent druggists.

EMPLASTRA — PLASTERS.

The making and spreading of Plasters, which was formerly quite an important feature of the business of the apothecary, is now nearly a lost art as far as the retail druggist is concerned, the business having been relegated to manufacturers, who have experience and suitable machinery for the work, and furnish all the necessary combinations in the plaster line. In this country several large establishments are devoted entirely to the manufacture of plasters, and from long experience and experiment have perfected their products to a high degree. It is not therefore supposed that many druggists will attempt to make their spread plasters, but only such plaster masses as are occasionally used in making other preparations, or sometimes called for in old formulas.

For spreading Plasters in a small way the Plaster Iron is generally used. Plaster-spreading machines are advertised, but they are not generally practical.

The following are the Plasters now official in the U. S., Br. and German Pharmacopœias :

810. **Emplastrum Ammoniaci.**

Ammoniac Plaster.

Ammoniac,	5 ounces.
Diluted Acetic Acid,	7 ounces.

Digest the Ammoniac in the Diluted Acetic Acid until it is entirely emulsionized; then strain and evaporate by means of a water-bath, stirring constantly until a small portion taken from the vessel hardens on cooling.

811. Emplastrum Ammoniaci cum Hydrargyro.*Ammoniac Plaster with Mercury.*

Ammoniac,	4	ounces av.
Mercury,	1	ounce av.
Olive Oil,	19	grains.
Sublimed Sulphur,	2½	grains.
Diluted Acetic Acid,	5⅓	fl.ounces.
Lead Plaster, a sufficient quantity.		

Digest the Ammoniac in the Diluted Acetic Acid and proceed as directed for making Ammoniac Plaster. Heat the Olive Oil and gradually add the Sulphur until they unite; then add the Mercury and triturate until extinguished. Next, add gradually the Ammoniac Plaster while yet hot; and, finally, having added enough Lead Plaster previously melted to make the mixture weigh 5½ ounces av., mix them thoroughly together.

The Br. formula corresponds with the U. S., 1870, Acetic Acid and Lead Plaster being omitted.

812. Emplastrum Arnicæ.*Arnica Plaster.*

Extract of Arnica Root,	1	ounce.
Resin Plaster,	2	ounces.

Add the Extract to the Plaster, previously melted by means of a water-bath, and mix them thoroughly.

813. Emplastrum Asafœtidæ.*Asafetida Plaster.*

Asafetida,	3½	ounces av.
Lead Plaster,	3½	ounces av.
Galbanum,	1½	ounce av.
Yellow Wax,	1½	ounce av.
Alcohol,	14	fl.ounces.

Digest the Gums with the Alcohol on a water-bath, and strain while hot; evaporate to the consistence of honey; then

add the Lead Plaster and Wax, previously melted together, stir the mixture well, and evaporate to the proper consistence.

814. **Emplastrum Belladonæ.**

Belladonna Plaster.

The U. S. 1880 formula directs to make a solid extract from Belladonna Root 100 parts, by exhausting with Alcohol and evaporating, and then to add to the Extract enough Resin Plaster, previously melted, to make 100 parts, and mix thoroughly.

The Belladonna Extract is best made by water-bath percolation as directed. (See Extract Belladonna Root.)

The Br. Pharmacopœia directs:

Alcoholic Extract of Belladonna,	. . . 1 part.
Resin Plaster,	. . . . . 2 parts.
Soap Plaster,	. . . . . 2 parts.

Melt the Plasters by the heat of a water-bath, then add the Extract, and mix the whole thoroughly together.

815. **Emplastrum Capsici.**

Capsicum Plaster.

The official Capsicum Plaster is made by first spreading Resin Plaster upon muslin and then brushing it over with a thin coating of Oleoresin of Capsicum, leaving a narrow blank margin along the edges. As furnished by manufacturers, the Oleoresin or Extract of Capsicum is first incorporated with the plaster mass before spreading.

816. **Emplastrum Cantharidis.**

Cantharides Plaster.

In the U. S. P. this is classed among the Cerates, as *Ceratum Cantharidis* (376), which see. The Br. formula for Emplastrum

Cantharidis is given under the same heading. The German Pharmacopœia gives two formulas, one being called *Emplastrum Cantharidum Ordinarium*, or *Spanischfliegenpflaster*, and the other *Emplastrum Cantharidum Perpetuum*, or *Zugpflaster*. The former is similar to the U. S. Cerate Cantharidis; the latter contains $2\frac{1}{2}$ per cent. Euphorbium.

817. Emplastrum Cerussæ.

White Lead Plaster, Bleiweisspflaster.

The G. P. gives the following formula:

Lead Plaster,	60 parts.
Common Olive Oil,	10 parts.
Carbonate of Lead,	35 parts.

Melt the Lead Plaster and Olive Oil together and add the Carbonate of Lead; boil the mixture, stirring frequently, and occasionally adding a little water until it is reduced to the consistence of plaster.

818. Emplastrum Ferri.

Iron Plaster, Strengthening Plaster, U. S., Chalybeate Plaster, Br.

The U. S., 1880, formula is:

Hydrated Oxide of Iron, dried at a temperature not exceeding 80° C. (176° F.) .	1 ounce.
Canada Turpentine (Balsam Fir),	1 ounce.
Burgundy Pitch,	1 ounce.
Lead Plaster,	7 ounces.

Melt the Lead Plaster, Balsam, and Pitch by means of a water-bath, then add the Oxide of Iron and stir continually until the mixture thickens on cooling.

The Br. formula is Peroxide of Iron, in fine powder, 1 ounce, Burgundy Pitch 2 ounces, Lead Plaster 8 ounces.

819. Emplastrum Fuscum Camphoratum.*Universal Plaster, Mutterpflaster.*

The G. P. contains the formula for this Plaster, more familiarly known in this country as *black plaster* :

Oxide of Lead, in fine powder,	30 parts.
Common Olive Oil,	60 parts.
Yellow Wax,	15 parts.
Camphor,	1 part.

Boil the Oxide of Lead and Olive Oil together, constantly stirring until the mass has acquired a blackish-brown color, then add the Yellow Wax, and then, while cooling, the Camphor previously triturated with a little Olive Oil.

820. Emplastrum Galbani.*Galbanum Plaster.*

The U. S. formula is :

Galbanum,	8 ounces.
Turpentine (Gum Thus.),	1 ounce.
Burgundy Pitch,	3 ounces.
Lead Plaster,	38 ounces.

To the Galbanum and Turpentine, previously melted together and strained, add, first the Burgundy Pitch and then the Lead Plaster, melted over a gentle fire, and mix the whole together.

The Br. formula is Galbanum, Ammoniacum, Yellow Wax of each 1 ounce, Lead Plaster 8 ounces.

821. Emplastrum Hydrargyri.*Mercurial Plaster.*

The U. S. formula is :

Mercury, by weight,	3 ounces.
Olive Oil, by weight,	1 ounce.
Resin, by weight,	1 ounce.
Lead Plaster,	5 ounces.

Melt the Oil and Resin together, and, when they have become cool, rub the Mercury with it until extinguished ; then

gradually add the Lead Plaster, previously melted, and mix the whole thoroughly together.

The Br. formula is Mercury 3 ounces, Olive Oil 56 grains, Sublimed Sulphur 8 grains, Lead Plaster 6 ounces. It is made in a similar manner.

The German formula resembles the U. S., but directs Turpentine (Gum Thus) instead of Resin.

822. **Emplastrum Ichthyocollæ.**

Isinglass Plaster, Court Plaster.

This is made by dissolving 10 parts of Isinglass in enough hot water to make 120 parts; one half of this solution is then spread in successive layers with a brush upon taffeta stretched on a level surface. The remainder of the solution is then mixed with 40 parts of Alcohol and 1 part of Glycerin, and the taffeta is again varnished with the solution as before. To make water-proof, varnish the back side of the taffeta with Tincture Benzoin.

This method of preparing Court Plaster is similar to that used by manufacturers, except that the fresh fish-sounds are generally used for making the solution and that the taffeta is usually brushed over with the solution a great many times. Some manufacturers have machinery by which the solution can be more evenly spread. Court Plaster is made in various colors by coloring the solutions. It is also made on silk, thin muslin, and paper. For the retail trade it is put up in small packages containing different colored sheets, and sold as Court Plaster. For physicians' use it is furnished in yard rolls.

823. **Emplastrum Opii.**

Opium Plaster.

The U. S. formula is:

Extract of Opium,	1	ounce.
Burgundy Pitch,	3	ounces.
Lead Plaster,	12 $\frac{2}{3}$	ounces.
Water,	1 $\frac{1}{2}$	ounces.

Rub the Extract of Opium with the Water until uniformly soft, and add to it the Pitch and Lead Plaster, melted together

by means of a water-bath; then continue the heat for a short time, stirring constantly, until the moisture is evaporated.

The Br. formula is: Opium in finest powder 1 ounce or 1 part, Resin Plaster 9 ounces or 9 parts; melt the Plaster by means of a water-bath, then add the Opium by degrees and mix thoroughly.

824. **Emplastrum Picis.**

Pitch Plaster.

The Br. P. gives the following formula. There is no corresponding U. S. formula:

Burgundy Pitch,	26	ounces or parts.
Common Frankincense,	13	ounces or parts.
Resin,	4½	ounces or parts.
Yellow Wax,	4½	ounces or parts.
Expressed Oil of Nutmeg,	1	ounce or part.
Olive Oil,	2	ounces or parts.
Water,	2	ounces or parts.

Add the Oils and Water to the Frankincense, Burgundy Pitch, Resin, and Wax, previously melted together; then, constantly stirring, evaporate to a proper consistence.

825. **Emplastrum Picis Burgundicæ.**

Burgundy Pitch Plaster.

Burgundy Pitch,	90 parts or 9 ounces.
Yellow Wax,	10 parts or 1 ounce.

Melt them together, strain the mixture and stir constantly until it thickens on cooling.

826. **Emplastrum Picis Canadensis.**

Canada Pitch Plaster, Hemlock Pitch Plaster.

Canada Pitch (Hemlock Gum),	90 parts or 9 ounces.
Yellow Wax,	10 parts or 1 ounce.

Melt them together, strain the mixture and stir constantly until it thickens on cooling.

827. Emplastrum Picis cum Cantharide.

Pitch Plaster, with Cantharides — Warming Plaster.
(Emplastrum Calefaciens, Br.)

The U. S. formula is :

Burgundy Pitch, 92 parts or 11½ ounces.
 Cerate of Cantharides, . . . 8 parts or 1 ounce.

Heat the Cerate as nearly as possible to 100° C. (212° F.) on a water-bath, and, having continued the heat for 15 minutes, strain it through a close strainer which will retain the Cantharides. To the strained liquid add the Pitch, melt them together by means of a water-bath, and, having removed the heat, stir the mixture constantly until it thickens.

The Br. formula directs an infusion of Cantharides 1 part in 5 parts of boiling water for six hours, then strain and press through a calico strainer and evaporate the liquid until it is reduced to ⅓ part. Expressed Oil of Nutmeg, Yellow Wax, and Resin each 1 part, Resin Plaster 13 parts, Soap Plaster 8 parts, are then melted together with the Extract of Cantharides, and well stirred until the whole is thoroughly mixed.

828. Emplastrum Plumbi.

Lead Plaster, Diachylon Plaster, Litharge Plaster.

The U. S. formula is :

Oxide of Lead (Litharge), in very fine
 powder, 8 ounces.
 Olive Oil, by weight, 15 ounces.
 Water, a sufficient quantity.

Rub the Oxide of Lead with about one half the Olive Oil and add the mixture to the remainder of the Oil, contained in a suitable vessel of a capacity equal to three times the bulk of the ingredients ; then add about 4 ounces of boiling Water and boil the whole together until a homogeneous plaster is formed, adding from time to time during the process a little Water as that first added is evaporated.

The Br. formula directs 5 ounces of Oxide of Lead, 10 ounces of Olive Oil, and 5 ounces of Water, to be boiled together by the heat of a steam bath for four or five hours, stirring constantly until the product acquires a proper consistence for a plaster, adding more Water during the process if necessary.

The German Pharmacopœia directs equal parts of common Olive Oil, Lard and Oxide of Lead to be boiled together with Water in the same manner as above directed. It is called *Emplastrum Lithargyri* in the G. P.

Lead Plaster is the basis of most of the official plasters. The British formula makes the best product.

The Compound Lead Plaster (*Emplastrum Lithargyri Compositum*) of the German Pharmacopœia is nearly identical with the Galbanum Plaster of the Br. P.

829. **Emplastrum Plumbi Iodidi.**

Iodide of Lead Plaster.

This is official in the Br. P., as follows:

Iodide of Lead,	2 ounces or 1 part.
Lead Plaster,	16 ounces or 8 parts.
Resin,	2 ounces or 1 part.

Add the Iodide of Lead, in fine powder, to the Plaster and Resin, previously melted at as low a temperature as possible, and mix them intimately.

830. **Emplastrum Resinæ.**

Resin Plaster, Adhesive Plaster.

The U. S. formula is:

Resin, in fine powder,	14 parts or $\frac{7}{8}$ ounce.
Lead Plaster,	80 parts or 5 ounces.
Yellow Wax,	6 parts or $\frac{3}{8}$ ounce.

To the Lead Plaster and Wax, melted together over a gentle fire, add the Resin and mix them.

The Br. formula is Resin 4 ounces or 2 parts, Lead Plaster 2 pounds (av.) or 16 parts, Curd Soap 2 ounces or 1 part. To

the Lead Plaster, previously melted at a low temperature, add the Resin and Soap, first liquefied, and stir them until they are thoroughly mixed.

This is the "Adhesive Plaster," which, when spread, is used so extensively in surgery. Druggists are familiar with the spread plaster but are little acquainted with the plaster mass.

831. **Emplastrum Saponis.**

Soap Plaster.

The U. S. formula is :

Soap, dried and in fine powder, 10 parts or 1 ounce.
Lead Plaster, 90 parts or 9 ounces.
Water sufficient.

Rub the Soap with Water until brought to a semi-liquid state, then mix it with the Lead Plaster, previously melted, and evaporate to the proper consistence.

The Br. formula is Curd Soap 6 ounces, Lead Plaster 2¼ pounds av., Resin 1 ounce. To the Lead Plaster, melted at a low temperature, add the Soap and the Resin, first liquefied ; then, constantly stirring, evaporate to a proper consistence.

The German formula is Lead Plaster 70 parts, Yellow Wax 10 parts, melted together, and to the partially cooled mass add medicinal Soap, powdered, 5 parts, and Camphor, rubbed with a little Olive Oil, 1 part.

832. **Emplastrum Saponis Fuscum.**

Brown Soap Plaster.

The Br. formula directs :

Curd Soap, in powder, 10 parts or ounces.
Yellow Wax, 12 parts or ounces.
Olive Oil, 20 fl.parts or fl.ounces.
Oxide of Lead, 15 parts or ounces.
Vinegar, 160 fl.parts or ounces.

Boil the Vinegar and Oxide of Lead together by the heat of a steam bath, constantly stirring them, until the Oxide has

combined with the Acid; then add the Soap and boil again until most of the moisture is evaporated; finally, add the Wax and Oil, melted together, and stir the whole continuously, maintaining the heat until, by evaporation of the remaining moisture, the product has acquired the proper consistence for a plaster.

Other Plasters.

The official Plasters for which formulæ have been given embrace most that are used to any extent in pharmacy; but a few others deserve attention, and are therefore mentioned here:

833. Aconite Plaster.—This Plaster was formerly official in the U. S. P. It is made by exhausting 16 ounces of Aconite Root with Alcohol, evaporating to a soft extract and adding to it sufficient Resin Plaster, previously melted, to make 16 ounces.

834. Antimonial Plaster.—This is best prepared extemporaneously by sprinkling Tartar Emetic in very fine powder on the surface of common Adhesive Plaster or any kind of spread plasters. It is used as a counter-irritant.

835. Camphor Plaster.—For extemporaneous work Camphor in fine powder may be applied to the warmed surface of adhesive or other spread plaster. Several plasters containing Camphor are official.

836. Cancer Plaster.—Several Plasters are furnished for the purpose of removing Cancers. The one to which the greatest success is attributed is used by some of the most noted cancer doctors. Sheep-sorrel is gathered green and pounded to a pulp, the juice is expressed and dried on pewter plates to an extract; this is then used as it is as a plaster, or combined with some sort of adhesive salve and applied. Another Cancer Plaster is made with Extract of Hemlock 1 drachm, Arsenious Acid in very fine powder 30 grains, Wax Plaster 1 ounce.

Many other Cancer Plasters are used, most of them consisting of Arsenic combined with other substances.

837. Corn Plaster.—A great variety of Corn Plasters are found in the market, the most popular being made of Felt coated with Adhesive Plaster, and a hole punched in the centre to relieve the pressure from the corn. These are not in any way medicinal, but simply remove the pressure from the corn.

To apply to corns in the form of a plaster, the following will be found effective: Salicylic Acid 60 grains, Beeswax 6 drachms, Venice Turpentine

2 drachms, Verdigris, in fine powder, 60 grains. Melt the Wax, add the Venice Turpentine, and mix in the other ingredients.

838. Croton-Oil Plaster.—The most common way of making a Croton-Oil Plaster is to rub a few drops of Croton-Oil over the surface of Adhesive or any spread plaster. It can also be made by melting Lead Plaster and adding 1 part of Croton-Oil to 6 parts of the plaster.

839. Elemi Plaster.—Wax Plaster 3 parts, Gum Elemi 1 part, melted together. This is also called *Issue Plaster*.

840. Euphorbium Plaster.—Burgundy Pitch Plaster 8 ounces, melted and mixed with Euphorbium in fine powder 1 drachm. *Capuchin Plaster* is sometimes furnished by the name of Euphorbium Plaster. It is made of Burgundy Pitch and Beeswax each 3 ounces, Venice Turpentine 1 ounce, melted together and then added to the mass Gum Ammoniacum, Olibanum, Mastich and Calamine, each 1 ounce. Euphorbium, Pyrethrum (pellitory) and Common Salt, all in fine powder, each 2 ounces. The whole is then well mixed together.

841. Extract Plasters.—A great variety of plasters may be made by mixing solid extracts of drugs with Burgundy Pitch Plaster, Resin Plaster, Lead Plaster, or other combined plasters. The plaster is first melted and the extract incorporated. The proportion is generally 1 part of extract to 9 parts of plaster.

842. Issue Plaster.—Beeswax 8 parts, Burgundy Pitch and Chian Turpentine, each 4 parts, Vermilion and Orris Root each 1 part. Many other stimulating plasters are used as Issue Plasters.

843. Mustard Plaster.—This is always made extemporaneously by mixing powdered Mustard to a stiff paste with warm water or vinegar. It is usually diluted with 3 or 4 parts of Corn-meal.

Ginger Plaster may be made in the same way. *Spread Mustard Plasters* are prepared mustard spread upon paper. The formulæ will be found under *Charta Sinapis* (407).

844. Poor Man's Plaster.—This is another name for Pitch Plaster, which is conveniently made by melting together Beeswax 1 ounce, Resin 3 ounces, Tar 3 ounces, and spreading upon paper or cloth.

845. Quinine Plaster.—Quinine may be mixed with Adhesive, Wax or Lead Plaster, or any compound plasters, when melted, in the proportion of 1 part to 10, or any other proportion desired. Other alkaloids or their salts may also be combined in the same way.

846. Sticking Plaster or Sticking Salve.—A great variety of Sticking Salves or Plasters are found in the market, most of them being made of Burgundy Pitch combined with various ingredients and sold under various names. The following formula makes a first-class "Sticking Salve":

Burgundy Pitch 6 parts, Resin 4 parts, Turpentine Gum 2 parts, Canada Balsam 1 part, Yellow Wax 2 parts, Venice Turpentine 1 part. Melt them

together. This may be colored green with Bayberry Wax 2 parts. It is put up in small round sticks and sold by various names.

847. Verdigris Plaster.—Beeswax 4 parts, Burgundy Pitch 2 parts, melted together, and, while liquid, Venice Turpentine 1 part and powdered Verdigris 1 part added and stirred while cooling.

848. Wax Plaster or Simple Plaster.—Beeswax 3 parts, Yellow Resin 2 parts, Suet (fresh tallow) 2 parts, melted together and stirred while cooling.

849. Zinco-Lead Plaster.—Beeswax 8 ounces, Olive Oil 3 ounces, Black Lead 3 ounces, Carbonate of Lead 2 ounces, Calamine 1 ½ ounce, Olibanum ¾ ounce. Melt and mix together to make a plaster.

The foregoing are all the Plasters for which formulæ are generally needed; but many other combinations are made, and may occasionally be called for. The judgment of the druggist will generally enable him to prepare any combination that may be wanted.

EMULSIONES — EMULSIONS.

Emulsions are preparations in which an oil, liquid resin, balsam, or other fluid fatty matter is made to combine with water or aqueous solutions by means of some substance which combines with it to form a homogenous mixture in which the globules of oil or other substance are so broken up or divided as to be invisible except by a microscope. To fulfill the required conditions, an Emulsion must be of a uniform consistence, permanent without separation, miscible in all proportions with water, syrup or aqueous liquids, and sufficiently fluid to be poured readily from a bottle. To make such an Emulsion it is necessary to use the proper emulsifying ingredients in the proper proportions and to combine them in the proper manner, all of which requires an understanding of the method of making emulsions and care in preparing them.

In medicine Emulsions are employed to render many nauseating medicines palatable, and by minutely dividing the globules of oil, etc., fitting them for digestion and assimilation. They are mainly employed as nutritive food in debilitated conditions.

Emulsification is the process of making emulsions, which may be briefly described as follows :

850. General Directions for Preparing Emulsions.

To prepare Emulsions in a small way, choose a shallow-shaped mortar that will hold double the quantity of the Emulsion desired to be made, and a pestle with a large flattened head. See that the mortar and pestle are perfectly dry, then put the powdered Gum Arabic in the mortar, and gradually add the water, rubbing it to a smooth paste: or if Acacia Mucilage Syrup is used, rub it with the pestle around the sides of the mortar. Then begin to add the Oil by pouring it very slowly from a bottle into the centre of the Gum Solution, constantly rubbing it with the pestle with a circular motion around the sides of the mortar. This will form a thick pasty mass, which should get thicker as more Oil is added. If the Oil does not combine as rapidly as added, stop pouring for a moment and work the mass with the pestle until it is homogeneous. The Oil should be more slowly added as the process proceeds, and care must be used to maintain a coating of the pasty mass on the sides of the mortar and on the pestle, the Oil being broken up and emulsified between the two clinging surfaces thus presented. When all the Oil is added, the mass should be white and of a thick, pasty consistence, having no globules of Oil visible. The Flavoring Oils should then be added, the Glycerin or Syrup incorporated with the mass by rubbing them together, and then the water, to which is added any salts or solutions that are directed to be incorporated, should be gradually added and thoroughly rubbed with the pasty mass to complete the Emulsion.

If any insoluble salts or other insoluble substances are to be added, they should be reduced to a very fine powder and rubbed with the Emulsion when completed.

In making Emulsions it frequently happens that the Oil is added too fast to emulsify, or that the sides of the mortar become "greased" and will not "cling" to the Oil and break up its globules. It is then necessary to start the Emulsion over

again in a clean dry mortar, with a small quantity of fresh Mucilage Syrup, and work in the "cracked" Emulsion in the mortar in the same manner as at first. The clinging surfaces must be maintained or the Emulsion cannot be made.

On a large scale Emulsions are best made in revolving churns or other apparatus by which the Oil and Mucilage may be thoroughly agitated. The Mucilage sufficient for the whole batch is first put in the churn and the inside thoroughly covered, the Oil is then added in portions and the mixture well agitated after each portion is added.

The Mucilage or Mucilage Syrup which is used for emulsifying must be sweet and fresh, and of a uniform consistence without lumps.

851. Acacia Mucilage Syrup.

For making Emulsions it is most convenient to have a Mucilage Syrup prepared and ready, for when made by rubbing powdered Gum Arabic with Water considerable delay is experienced and the results are not always satisfactory. We have, therefore, found it desirable to have the following syrup prepared for this purpose:

Best Gum Arabic, granulated,	. . .	6 ounces av.
Albumen, (white of egg,)	. . . . .	8 fl.ounces.
Glycerin,	. . . . .	4 fl.ounces.
Boric Acid,	. . . . .	30 grains.

Rub the Boric Acid to a very fine powder, and dissolve by rubbing with the Glycerin. Mix the solution with the Albumen in a wide-mouth bottle or jar, add the Gum Arabic, and stir several times a day with a stick from the bottom, until the Gum is entirely dissolved, strain, if necessary, stop tight, and put away in a cool place.

This requires two or three days to make, as heat cannot be used to effect the solution. It should be kept on hand, but it may be quickly made by using powdered Gum Arabic and rubbing with the Glycerin, etc., in a mortar.

This is used as the emulsifying agent instead of Gum Arabic alone, as it is more effective.

852. Stronger Lime Water.

Lime, in lump, selected,	1 ounce av.
Water,	14 fl.ounces.
Sugar,	4 ounces av.

Slack the Lime by pouring upon it half an ounce of hot water, and allowing to stand until it is reduced to a powder, add the Water and Sugar, allow to stand, and filter.

This is sometimes used in making preparations of Cod Liver Oil that are sold as emulsions, although it does not make a true Emulsion, but rather saponifies the Oil, the Hydrate of Calcium uniting with the oleic acid of the Oil.

853. Emulsion Castor Oil.*Tasteless Cod Liver Oil.*

Castor Oil,	8 fl.ounces.
Acacia Mucilage Syrup,	5 fl.ounces.
Oil of Wintergreen,	20 minims.
Water,	3 fl.ounces.

Rub the Oils with the Syrup, and add the Water as directed (850). The efficacy of Castor Oil as thus prepared is very much increased, and it is not unpleasant to take. The dose is a dessertspoonful to a tablespoonful in milk or plain. It contains 50 per cent. of Oil.

854. Emulsion Cod Liver Oil.*Tasteless Cod Liver Oil.*

Cod Liver Oil,	8 fl.ounces.
Acacia Mucilage Syrup,	5 fl.ounces.
Oil Bitter Almonds,	10 drops.
Oil Wintergreen,	5 drops.
Water,	3 fl.ounces.

Rub the Oils with the Syrup and add the Water as directed (850). This Emulsion contains 50 per cent. of Oil, and is very

palatable if made from good Oil. The dose is a dessertspoonful to a tablespoonful.

The New-York and Brooklyn Formulary gives the following:

855. **Emulsio Olei Morrhuæ Fortior.**

Stronger Emulsion of Cod Liver Oil.

Acacia, in fine powder,	2 ounces av.
Sugar, in fine powder,	4 ounces av.
Cod Liver Oil,	16 fl.ounces.
Water, enough to make	28 fl.ounces.

Mix the Acacia and Sugar with the Cod Liver Oil in a dry mortar, and add 8 fl.ounces of Water, then triturate thoroughly and continuously until the Oil is emulsified, and finally incorporate enough Water to make the product measure 28 fl.ounces. The *Common Emulsion of Cod Liver Oil* is made by mixing 14 fl.ounces of the Stronger Emulsion of Cod Liver Oil, 15 minims each Oil of Sassafras and Wintergreen, Water enough to make 16 fl.ounces. This makes a 50 per cent. Emulsion. Unless this Emulsion is very skillfully made it will soon separate, and it will soon ferment in warm weather. It is therefore good only for immediate use.

856. **Cod Liver Oil with Lime.**

This is not a true Emulsion, but has every appearance of one, and is much sold both as plain Emulsion of Cod Liver Oil and as Emulsion of Cod Liver Oil and Lime. It is very conveniently made and gives good satisfaction, but thickens after a time, and is therefore not desirable to put upon the market.

Cod Liver Oil,	8 fl.ounces.
Stronger Lime Water,	4 fl.ounces.
Syrup,	4 fl.ounces.
Oil Bitter Almonds,	10 drops.
Oil Wintergreen,	5 drops.

This may be mixed simply by shaking together violently in a bottle. It is a valuable preparation whenever Lime is indicated in connection with Cod Liver Oil. The dose is a dessertspoonful or more.

857. Emulsion of Cod Liver Oil with Hypophosphites of Lime and Soda.

Cod Liver Oil,	8 fl.ounces.
Acacia Mucilage Syrup,	5 fl.ounces.
Hypophosphite of Calcium,	64 grains.
Hypophosphite of Sodium,	64 grains.
Oil Wintergreen,	10 drops.
Oil Bitter Almonds,	5 drops.
Water,	3 fl.ounces.

Rub the Oils with the Mucilage Syrup, dissolve the salts, first reduced to a fine powder, in the Water, and add as directed (850).

A dessertspoonful, which is the usual dose, contains 1 grain each of the Hypophosphites of Lime and Soda and 50 per cent. of Oil.

This has been a very popular preparation, extensively sold as a proprietary remedy, and much prescribed in all parts of the country.

Quite a number of combinations of this Emulsion with other preparations are found in the market, but they may be made generally as required by adding the desired ingredients.

858. Cod Liver Oil with Iodine.

Cod Liver Oil,	8 fl.ounces.
Acacia Mucilage Syrup,	5 fl.ounces.
Compound Solution of Iodine,	1 fl.ounce.
Water,	2 fl.ounces.
Oil Bitter Almonds,	10 drops.

Rub the Oils with the Mucilage Syrup, add the Solution of Iodine and Water as directed (850).

A dessertspoonful, which is the usual dose, contains $\frac{1}{3}$ grain Iodine, $\frac{2}{3}$ grain Iodide of Potassium, and 50 per cent. Cod Liver Oil. There is also a preparation called Iodized or Iodinized Cod Liver Oil, which is a solution of Iodine in Cod Liver Oil, not an Emulsion. It is noticed under Proprietary Medicines.

859. Emulsion Cod Liver Oil, Iodo-Ferrated.

Cod Liver Oil,	8 fl.ounces.
Acacia Mucilage Syrup,	5 fl.ounces.
Tasteless Iodide of Iron,	128 grains.
Water,	3 fl.ounces.
Oil Bitter Almonds,	10 minims.
Oil Wintergreen,	5 minims.

Rub the Oils with the Mucilage Syrup, dissolve the Iodide of Iron in the Water, and add the solution as directed (850).

A teaspoonful, which is the usual dose, contains 2 grains Tasteless Iodide of Iron and 50 per cent. of Cod Liver Oil. There is also a preparation called Iodo-Ferrated Cod Liver Oil, which is not an Emulsion. See Proprietary Medicines.

860. Emulsion Cod Liver Oil with Iodide of Potassium.

Iodide of Potassium,	256 grains.
Water,	1 fl.ounce.
Cod Liver Oil Emulsion (854),	15 fl.ounces.

Dissolve the Iodide in the Water and mix with the Emulsion.

A dessertspoonful, the usual dose, contains 4 grains of Iodide of Potassium combined with Emulsion Cod Liver Oil.

861. Emulsion Cod Liver Oil with Iron.*Emulsion Cod Liver Oil, Ferrated.*

Cod Liver Oil may be combined with any of the soluble salts of Iron, as the Phosphate, Pyrophosphate, Citrate, etc., and also with solutions of Iron, as Dialysed Iron, etc. The following formula may be used:

Phosphate of Iron in scales, 1880 (or any other soluble salt of Iron),	128 grains.
Water,	$\frac{1}{2}$ fl.ounce.
Emulsion Cod Liver Oil (854),	1 pint.

Dissolve the Iron salt in the Water by the aid of heat, and add the solution to the Emulsion, rubbing them well together.

A dessertspoonful contains 2 grains of the Iron salt and 50 per cent. of Cod Liver Oil.

862. Emulsion Cod Liver Oil with Lacto-phosphate of Iron.

Solution Lacto-phosphate of Iron, . . . $\frac{1}{2}$ fl.ounce.

Emulsion Cod Liver Oil (854), . . . 1 pint.

Add the solution to the Emulsion and mix them thoroughly. A dessertspoonful contains 1 grain Lacto-phosphate of Iron combined with Emulsion Cod Liver Oil.

863. Emulsion Cod Liver Oil with Lacto-phosphate of Lime.

Solution Lacto-phosphate of Calcium, 1 fl.ounce.

Emulsion Cod Liver Oil (854), . . . 15 fl.ounces.

Mix them thoroughly. A dessertspoonful contains 2 grains Lacto-phosphate of Lime with Emulsion Cod Liver Oil.

This may also be made by rubbing 128 grains of Precipitated Lacto-phosphate of Lime with a pint of the Emulsion of Cod Liver Oil.

864. Emulsion Cod Liver Oil with Lacto-phosphates Compound.

Solution Lacto-phosphate of Iron, . . . $\frac{1}{2}$ fl.ounce.

Solution Lacto-phosphate of Calcium, 1 fl.ounce.

Emulsion Cod Liver Oil (854), . . . $14\frac{1}{2}$ fl.ounces.

Mix the solutions with the Emulsion.

A dessertspoonful contains 1 grain Lacto-phosphate of Iron and 2 grains Lacto-phosphate of Lime.

This may also be made by rubbing 64 grains Lacto-phosphate of Iron and 128 grains Lacto-phosphate of Calcium with a pint of Emulsion Cod Liver Oil.

865. Emulsion Cod Liver Oil with Phosphate of Lime.

Solution Phosphate of Calcium, . . . 1 fl.ounce.

Emulsion Cod Liver Oil (854), . . . 15 fl.ounces.

Add the solution to the Emulsion and mix them thoroughly.

A dessertspoonful, the usual dose, contains 2 grains Phosphate of Lime with Emulsion Cod Liver Oil.

This may also be made by rubbing 256 grains Precipitated Phosphate of Lime with a pint of Emulsion Cod Liver Oil.

866. Emulsion Cod Liver Oil with Phosphates Compound.

Cod Liver Oil with Chemical Food.

Concentrated Solution of Phosphates, $\frac{1}{2}$ fl.ounce.

Emulsion Cod Liver Oil (854), . . . 1 pint.

Add the solution to the Emulsion and mix them thoroughly.

A dessertspoonful contains about $3\frac{1}{2}$ grains of Mineral Phosphates with 50 per cent. Cod Liver Oil.

867. Emulsion Cod Liver Oil with Phosphate of Lime and Wild Cherry.

Fluid Extract Wild Cherry, 2 fl.ounces.

Emulsion Cod Liver Oil and Phosphate

of Lime, 14 fl.ounces.

Mix them thoroughly. Dose, a dessertspoonful.

868. Emulsion Cod Liver Oil with Pepsin.

Saccharated Pepsin, 128 grains.

Emulsion Cod Liver Oil (854), . . . 1 pint.

Rub the Pepsin first with a small portion of the Emulsion, and then with the remainder, and mix them thoroughly.

A dessertspoonful contains 2 grains of Pepsin combined with Emulsion Cod Liver Oil.

869. Emulsion Cod Liver Oil with Pepsin and Quinine.

Sulphate of Quinine,	64 grains.
Saccharated Pepsin,	128 grains.
Emulsion Cod Liver Oil (854),	1 pint.

Rub the Quinine and Pepsin together to a fine powder, then with a small portion of the Emulsion, and then with the remainder until thoroughly mixed.

A dessertspoonful contains 1 grain Quinine, 2 grains Pepsin, and 50 per cent. Cod Liver Oil.

870. Emulsion Cod Liver Oil Peptonized.

Peptonized Cod Liver Oil and Milk.

Condensed Milk,	2 ounces.
Saccharated Pepsin,	128 grains.
Acacia Mucilage Syrup,	3 fl.ounces.
Cod Liver Oil,	8 fl.ounces.
Oil of Bitter Almonds,	10 minims.
Oil of Wintergreen,	5 minims.
Water,	3 fl.ounces.

Rub the Condensed Milk with the Saccharated Pepsin and 1 fl.ounce of Water, and allow them to stand for 6 hours, then add the Mucilage Syrup, and rub the Oils with the mixture to make an Emulsion; finally, add the Water as directed (850).

The dose is a dessertspoonful to a tablespoonful.

Many combinations may be made by mixing this with other preparations, solutions, salts, etc.

871. Emulsion Cod Liver Oil with Pancreatine.

Pancreatine, in powder,	128 grains.
Cod Liver Oil,	8 fl.ounces.
Glycerin,	3 fl.ounces.
Water,	3 fl.ounces.
Acacia Mucilage Syrup,	2 fl.ounces.
Oil Wintergreen,	10 minims.
Oil Bitter Almonds,	5 minims.

Mix the Pancreatin with the Water and Glycerin, and let stand for 6 hours, then add the Acacia Mucilage Syrup, and rub the Oils with the mixture to make an Emulsion.

A dessertspoonful contains 2 grains Pancreatine, with 50 per cent. Cod Liver Oil.

872. Emulsion Cod Liver Oil with Pancreatine and Pepsin.

Pepsin, saccharated, 128 grains.

Emulsion Cod Liver Oil and Pancreatine, 1 pint.

Rub the Pepsin first with a portion of the Emulsion, then add the remainder.

A dessertspoonful contains 2 grains each of Pepsin and Pancreatine with 50 per cent. Cod Liver Oil.

873. Emulsion Cod Liver Oil with Wild Cherry.

Fluid Extract of Wild Cherry, . . . 4 fl.ounces.

Acacia Mucilage Syrup, 4 fl.ounces.

Cod Liver Oil, 8 fl.ounces.

Rub the Oil with the Mucilage Syrup, and add the Fluid Extract.

A dessertspoonful contains $\frac{1}{2}$ drachm Fluid Extract Wild Cherry with 50 per cent. Cod Liver Oil.

874. Emulsion Cod Liver Oil with Yolk of Egg, Cod Liver Oil and Glyconin.

A kind of Emulsion is made with the Yolks of Eggs by shaking them with Cod Liver Oil and other ingredients :

The Yolks of Eggs, $2\frac{1}{2}$ fl.ounces.

Glycerin, 3 fl.ounces.

Diluted Phosphoric Acid, 2 fl.ounces.

Sherry Wine, 4 fl.ounces.

Cod Liver Oil, 10 fl.ounces.

Old Bitter Almonds, 10 drops.

Oil Wintergreen, 10 drops.

Beat the Yolks of Eggs and Glycerin together, then add the Oils gradually, shaking them well together after adding each portion. Lastly, add the Acid and Wine, and mix them well together. The dose is a dessert to a tablespoonful.

A preparation made like this, but containing only half the quantity of Oil is known and prescribed as "*Hospital Emulsion*."

875. Cod Liver Oil Mixture with Hypophosphites.

The contents of two good-sized Eggs,	
white and yolk, about	3 fl.ounces.
Cod Liver Oil,	8 fl.ounces.
Oil Wintergreen,	10 drops.
Oil Bitter Almonds,	5 drops.
Hypophosphorous Acid, diluted (34),	2 fl.ounces.
Syrup Hypophosphites Compound,	4 fl.ounces.

Beat the Eggs with the Oils and add the Syrup and Acid.

A dessertspoonful contains $2\frac{1}{2}$ grains mixed Hypophosphites and 50 per cent. Cod Liver Oil. Wine or Brandy may be added to this mixture if desired.

876. Cod Liver Oil Mixture with Phosphates.

Cod Liver Oil with Chemical Food.

The contents of two good-sized Eggs,	
white and yolk, about	3 fl.ounces.
Cod Liver Oil,	8 fl.ounces.
Diluted Phosphoric Acid,	1 fl.ounce.
Syrup Phosphates Compound,	4 fl.ounces.
Oil Wintergreen,	10 drops.
Oil Bitter Almonds,	5 drops.

Beat the Eggs with the Oils and add the Syrup and Acid.

A dessertspoonful contains nearly 2 grains mixed Phosphates with 50 per cent. Cod Liver Oil. This may be mixed with Wine or Brandy if desired.

877. Phosphorated Emulsion Cod Liver Oil.

The contents of two good-sized Eggs,	
white and yolk, about	3 fl.ounces.
Phosphoric Acid, diluted,	2 fl.ounces.
Syrup,	2 fl.ounces.
Sherry Wine,	4 fl.ounces.
Cod Liver Oil,	8 fl.ounces.
Oil Bitter Almonds,	10 drops.
Oil Wintergreen,	5 drops.

Beat the Eggs with the Oils, and add the Syrup, Wine and Acid. Dose, a dessertspoonful to a tablespoonful.

878. Cod Liver Oil with Extract of Malt.

Cod Liver Oil,	8 fl.ounces.
Extract of Malt,	8 fl.ounces.
Oil Wintergreen,	20 minims.
Oil Bitter Almonds,	5 minims.

Rub the Oils with the Extract of Malt as directed for making Emulsions. The dose is a dessert to a tablespoonful, containing 50 per cent. each, Cod Liver Oil and Malt Extract.

Extract of Malt makes a semi-solid palatable mixture with Cod Liver Oil, and is an excellent combination for debilitated conditions and wasting diseases.

A great variety of combinations of Cod Liver Oil with Extract of Malt may be advantageously made, but it is unnecessary to give formulas for them, as they may be made by adding powders, Pepsin, Pancreatine, etc., or solutions, as Phosphate of Calcium, Phosphates Compound, etc., or other substances as may be desired.

879. Emulsion Copaiba.

Acacia Mucilage Syrup,	6 fl.ounces.
Balsam Copaiba,	4 fl.ounces.
Syrup,	3 fl.ounces.
Water,	3 fl.ounces.
Oil Wintergreen,	20 drops.

Rub the Oil and Balsam with the Mucilage Syrup, and add the Syrup and Water, as directed for making Emulsions.

A fl.drachm contains 15 minims Balsam Copaiba. The dose is a teaspoonful to a dessertspoonful or more.

880. Emulsion Olive Oil.

Acacia Mucilage Syrup,	6 fl.ounces.
Best Olive Oil,	8 fl.ounces.
Oil Wintergreen,	20 minims.
Water,	2 fl.ounces.

Rub the Oils with the Mucilage Syrup and add the Water as directed (850). Dose, a dessertspoonful containing 50 per cent. of Oil.

881. Emulsion Turpentine.

Acacia Mucilage Syrup,	6 fl.ounces.
Syrup,	3 fl.ounces.
Water,	3 fl.ounces.
Oil of Turpentine,	4 fl.ounces.
Oil of Wintergreen,	20 minims.

Rub the Oils with the Mucilage Syrup, and add the Syrup and Water as directed (850).

A fl.drachm contains 15 minims Oil of Turpentine. The dose is half to a teaspoonful or more.

882. Emulsion Canada Turpentine.

Emulsion Balsam Fir.

Acacia Mucilage Syrup,	6 fl.ounces.
Water,	3 fl.ounces.
Syrup,	3 fl.ounces.
Canada Balsam,	4 fl.ounces.
Oil of Wintergreen,	20 minims.

Rub the Oil and Balsam with the Mucilage Syrup, and add the Syrup and Water as directed (850).

A fl.drachm contains 15 minims Canada Balsam.

Other Emulsions.

A variety of other Emulsions may be made from fixed and volatile Oils, Balsams, Gums, Resins, Extracts, etc., in the same manner as the foregoing. A few sample formulas are given:

883. Emulsion of Almonds—*Milk of Almonds*.—Blanched Almonds, 1 ounce av., beat to a pulp, with water gradually added sufficient to make 10 fl.ounces, and strained through gauze or cheese cloth.

This may also be made with Oil of Almonds 3 fl.drachms, Acacia Mucilage Syrup 10 fl.drachms, Rose Water 1 fl.ounce, Distilled Water 3 fl.ounces. Rub the Oil with the Mucilage, then add the other ingredients.

884. Emulsion Asafetida.—Asafetida 1 ounce, Oil of Almonds 3 fl.ounces, Acacia Mucilage Syrup 4 fl.ounces, Water 3 fl.ounces. Warm the Asafetida with the Oil, and rub in a mortar until uniformly mixed, then rub with the Mucilage Syrup, and add the Water. This may be flavored with Peppermint if desired. Many other Gums or Gum Resins may be made into Emulsions in the same manner.

885. Emulsion Balsam Peru.—Balsam Peru 2 ounces, Acacia Mucilage Syrup 4 fl.ounces, Syrup 6 fl.ounces, Water 4 fl.ounces. Rub the Balsam with the Mucilage Syrup, add the Syrup and Water. Emulsions of other liquid Balsams and Oleo-resins may be made in the same manner.

886. Emulsion of Wax.—White Wax 1 ounce, Acacia Mucilage Syrup 4 ounces, Water 12 ounces. Melt the Wax, and having warmed the Mucilage Syrup to about 140°F., rub the melted Wax with it in a mortar, and gradually add the Water, warmed to about 100°F., rubbing them well together until cold. Emulsions of other waxes, Spermaceti, etc., may be made in the same manner.

ESSENTIÆ — ESSENCES — FLAVORING EXTRACTS.

The term *Essence* is applied in a general way to the important or essential part or portion of plants or other substances, and in pharmacy to a class of preparations made from or possessing the essential principles of substances, such as Essential Oils or their solutions in alcohol, Ethers used as artificial flavors, Fluid Extracts or Tinctures of odorous substances used for flavoring or in perfumery, etc., etc.

In the U. S. P. there is no mention of essences, but in the Br. P. Essence of Anise and Essence of Peppermint are assigned a place, being very much stronger solutions of the Essential Oils than the "Spirits" of the same. Many of the preparations which are commonly known as essences are found in the Spirits of the U. S. and other pharmacopœias, and others are found among the Ethers, Fluid Extracts, Tinctures, etc.

It is intended in this work to class under this heading only such preparations as are known as Essences and Flavoring Extracts—the *esprits* and essences used in perfumery being classed under perfumes.

The preparations included under this classification are naturally divided into several departments, as solutions of Essential Oils or Essences proper, many of which are also known as Extracts, Extracts of odorous substances used for flavoring, etc., Soluble Extracts or Essences used for flavoring beverages, Artificial Fruit, Essences or Flavors, and miscellaneous essences and extracts that cannot well be classified under any of these headings.

Concentrated Essences or Extracts.

Solutions of Essential Oils.

The Solutions of Essential Oils in Spirits have been familiarly known from time immemorial as "Essences," and the characteristic "Yankee Essence Peddler" is not even now entirely extinct in the rural districts.

No uniform standard of strength has ever been adopted for Essences, but the general practice of Pharmacists in this country is to use 1 ounce of the Oil in a pint of Alcohol for all the more common ones, but Peddlers' Essence is made much weaker as a rule.

It is needless to remark that only the best quality of oils and good cologne spirit or alcohol should be used in making all these preparations. Many of them are used for flavoring soda water syrups, and are known as "Concentrated Extracts." Others are extensively used for flavoring confectionery, ice

cream, and for culinary use, and some are well known domestic remedies.

890. Anise Essence.

Oil of Anise,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. The Essence of Anise of the Br. P. contains 20 per cent. of the Oil, which is double the strength of the U. S. Spirit of Anise; both are stronger than is generally sold as Essence of Anise.

891. Bay Essence.

Oil of Bay Leaves,	4 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. This is used for flavoring soups, etc., in place of the leaves. A soluble Essence of Bay for making Bay Rum may be made by dissolving 4 fl.drachms Oil of Bay in 6 ounces Cologne Spirit, rubbing 6 drachms of Carbonate of Magnesium with 8 ounces of Water, adding the mixture to the solution, and filtering.

892. Bergamot Essence.

Oil of Bergamot,	1 fl.ounce.
Cologne Spirit,	1 pint.

Mix and filter. This Essence is considerably called for as a scent for hair preparations, etc.

893. Bitter Almond Essence.

Oil of Bitter Almond,	4 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. This is sold as the Concentrated Essence or Extract of Bitter Almond. A good ordinary Essence may be made by dissolving 1 ½ fl.drachm of Oil Bitter Almond in 8 fl.ounces of Alcohol and adding 8 fl.ounces of Water.

894. Calamus or Sweet Flag Essence.

Oil of Calamus,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring confectionery, etc., and in making Bitters, etc. An extract may also be made by macerating 4 ounces av. of powdered Calamus in a pint of Alcohol.

895. Caraway Essence.

Oil of Caraway Seed, 1 fl.ounce.
 Cologne Spirit, 15 fl.ounces.

Mix them. Used for flavoring confectionery, pastry, etc.

896. Cardamom Essence.

Oil of Cardamom Seed, 4 fl.drachms.
 Cologne Spirit, 15 fl.ounces.

Mix them. Used for flavoring, etc. The Oil of Cardamom is quite expensive, but of fine flavor. An extract may also be made by macerating 4 ounces of powdered Cardamom Seed in a pint of Alcohol.

897. Cassia or Cinnamon Essence.

Oil of Cassia, 1 fl.ounce.
 Cologne Spirit, 15 fl.ounces.

Mix them. The U. S. Spirit of Cinnamon contains 10 per cent. of the Oil; the Br. contains but 2 per cent.

898. Cedar Essence.

Oil of Cedar, 1 fl.ounce.
 Cologne Spirit, 15 fl.ounces.

Mix them.

899. Celery Essence.

Oil of Celery, 4 fl.drachms.
 Cologne Spirit, 1 pint.

Mix them. Used for flavoring. An extract is also made from Celery Seed.

900. Clove Essence.

Oil of Cloves, 1 fl.ounce.
 Cologne Spirit, 1 pint.

Mix them. Used for flavoring, etc.

901. Cherry Essence.

Cherry Laurel Oil, 4 fl.drachms.
 Cologne Spirit, 1 pint.

Mix them. Used for flavoring.

902. Cognac Essence.

Oil of Cognac,	2 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. This is used for flavoring, also for making artificial Brandy. Good Oil of Cognac is very expensive. This Essence may be diluted, if desired, cheaper.

903. Coriander Essence.

Oil of Coriander,	4 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. Used for flavoring.

904. Curaçoa Essence.

Oil of Curaçoa,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring, like Orange.

905. Dill Essence.

Oil of Dill,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

906. Fennel Essence.

Oil of Fennel Seed,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

907. Hemlock Essence.

Oil of Hemlock,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

908. Juniper Essence.

Oil of Juniper Berries,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. The U. S. Spirit of Juniper contains 3 per cent. of the Oil; the Br. P. directs 2 per cent.

909. Lavender Essence.

Oil of Lavender,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. The U. S. Spirit of Lavender contains 3 per cent. of the Oil ; the Br. P. directs 2 per cent.

910. Lemon Essence.

Oil of Lemon, fresh,	1 fl.ounce.
Fresh Lemon Peel, chopped fine or grated,	1 ounce av.
Cologne Spirit,	15 fl.ounces.

Mix them and macerate for 7 days, then filter. The outer, yellow portion of the peel only should be used. If the fresh Lemon Peel cannot readily be obtained, color with a few chips of Fustic. This essence is the well-known Extract of Lemon, so much sold as a flavoring extract. It may be made stronger or weaker if desired by using more or less Lemon Oil ; but this formula makes an extract fully up to the standard. The U. S. P. directs 6 per cent. of Lemon Oil and 4 per cent. of Lemon Peel.

911. Lime Essence.

Oil of Limes,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring, like Lemon.

912. Mace Essence.

Oil of Mace, ethereal,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring, like Nutmeg.

913. Mustard Essence.

Oil of Mustard, essential,	4 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. Used for flavoring. The Oil of Mustard must be carefully handled.

914. Nutmeg Essence.

Oil of Nutmeg,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring. The Br. P. directs 2 per cent. of the Oil for making Spirit of Nutmeg.

915. Orange Essence.

Oil of Sweet Orange, fresh,	1 fl.ounce.
Fresh Orange Peel, outside, grated,	1 ounce av.
Cologne Spirit,	15 fl.ounces.

Mix them and macerate for 7 days, then filter. See remarks after Lemon Essence.

916. Parsley Essence.

Oil of Parsley,	4 fl.drachms.
Cologne Spirit,	1 pint.

Mix them. Used for flavoring.

917. Pennyroyal Essence.

Oil of Pennyroyal,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them, and filter.

918. Peppermint Essence.

Oil of Peppermint,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them, and filter. It is customary with some druggists to color Essence of Peppermint green, which may be done by adding a little peppermint herb to the Essence, or a little grass-green coloring (443). The U. S. P. Spirit of Peppermint contains 10 per cent. of the Oil; the Br. P. directs 2 per cent. of the Oil for making Spirit of Peppermint, but also gives an Essence of Peppermint containing 20 per cent. of the Oil.

919. Pimento or Allspice Essence.

Oil of Pimento,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. Used for flavoring.

920. Rose Essence.

Oil of Rose,	1 fl.drachm.
Cologne Spirit,	1 pint.

Mix them. This may be reduced if a cheaper Essence is desired.

921. Rosemary Essence.

Oil of Rosemary,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

922. Sage Essence.

Oil of Sage,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

923. Sarsaparilla Essence.

Oil of Sassafras,	3 fl.drachms.
Oil of Wintergreen,	4 fl.drachms.
Oil of Anise,	30 minims.
Cologne Spirit,	12 fl.ounces.
Water,	3 fl.ounces.

Mix them. This is the popular "Sarsaparilla Flavoring" so much used for flavoring Soda Water, Syrup Sarsaparilla, etc. A stronger flavor can be made by using a larger quantity of the Oils and no Water.

924. Sassafras Essence.

Oil of Sassafras,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

925. Spearmint Essence.

Oil of Spearmint,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. This may be colored with Spearmint herb or grass-green coloring if desired. See remarks under Essence Peppermint. The U. S. P. Spirit of Spearmint contains 10 per cent. of the Oil.

926. Spruce Essence.

Oil of Spruce,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them, and filter.

927. Wintergreen Essence.

Oil of Wintergreen,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them. The U. S. P. directs Spirits of Gaultheria to be made with 3 parts of Oil of Wintergreen and 97 parts of Alcohol.

928.

Wormwood Essence.

Oil of Wormwood,	1 fl.ounce.
Cologne Spirit,	15 fl.ounces.

Mix them.

Essences of other Oils may be made in the same manner as the preceding, the judgment of the druggist directing how much of the Essential Oil should be used with a pint of Alcohol.

Concentrated Extracts.

In this department are included the liquid extracts of substances, not Essential Oils, that are used as Flavoring Extracts, or for flavoring beverages, pastry, etc. Some of them are properly Fluid Extracts, others are Tinctures and others are mixtures both of Extracts and Essences.

929.

Angelica Extract or Essence.

Angelica Root, in coarse powder,	4 ounces av.
Alcohol,	12 fl.ounces.
Water, sufficient to make	1 pint.

Mix 4 ounces of Water with the Alcohol, and macerate the drug in the mixture for 7 days, then pour off the liquid, transfer the drug to a percolator, and percolate first with the poured off liquid, then with Water, until a pint is obtained.

This may also be made by mixing $\frac{1}{2}$ fl.ounce Oil of Angelica with a pint of Cologne Spirit.

930. Beef or Meat Extract, Essence or Juice.

A variety of preparations are sold under this name. The Extracts of Meat or Beef are usually of the consistence of a soft, solid Extract, while some are gelatinous. The Essences of Beef found in the market are liquid. Of the Beef or Meat Extracts, Liebig's is the most popular. It is made on a large scale in South America by evaporating Meat Juices in vacuo in iron cylinders — the finished Extract representing 32 times its weight of fresh meat. It is much used in making Wine of Beef and Iron and other similar nutritive preparations, and for making soups and other articles of diet.

Essence of Beef or Meat Juice is prepared from the expressed juice of fresh meat, condensed and preserved with glycerin. The most popular meat

juice in this country is Valentine's. It is said to contain the nutritive value of two pounds of beef in a fl.ounce.

In a small way Meat Juice may be made by chopping fresh beefsteak fine, enclosing it in a linen cloth, and pressing it in a lemon squeezer or a small press. It is much better and more nutritious than beef tea.

931. Chocolate Extract or Essence.

Confectioners' Cocoa or Chocolate, 16 ounces av.
Alcohol, a sufficient quantity.

Reduce the Cocoa or Chocolate to a coarse powder, and put in a wide-mouth quart bottle, pour upon it a pint of Alcohol, and shake them thoroughly together, let stand in a warm place for 12 hours, with occasional agitation, then heat in a water-bath for one hour or more to about 160°F., leaving a little vent in the cork for the steam to escape. When cool, pour off the liquid and add half a pint more of Alcohol, heat as before, and add the product to the liquid before obtained to make about a pint of the Extract. The Chocolate may be still more thoroughly exhausted by adding more Alcohol, concentrating the Tincture by distillation and adding the soft extract to the liquid formerly obtained.

932. Coffee Extract or Essence.

Java Coffee, browned or roasted, 8 ounces av.
Mocha Coffee, browned or roasted, 8 ounces av.
Alcohol, 8 fl.ounces.
Water, a sufficient quantity to make 1 pint.

Grind the Coffee to a moderately fine powder, mix the Alcohol with 8 ounces of Water, and moisten the powder with 8 ounces of the mixture, pack firmly in the water-bath percolator, pour the remainder of the mixture upon it, and set in a warm place for one day, then heat moderately, and after one hour begin to percolate, adding Water through the percolator, and continuing the percolation until 14 fl.ounces are obtained, which reserve, continue the percolation with Water until the drug is exhausted, then evaporate to 2 fl.ounces, and add to the reserved liquid to make a pint. This is a Fluid Extract of Coffee. It may be used for flavoring soda water syrups, etc., or medicinally. It requires about 4 fl.ounces to flavor a gallon of *Coffee Syrup* for soda water.

933. Jamaica Ginger Extract or Essence.

Extracts or Essences of Jamaica Ginger are well known as proprietary remedies, and are considerably used as flavors for pastry and other articles of diet. The following formula is for a Fluid Extract of Jamaica Ginger,

which is used chiefly for flavoring, or may be diluted for the proprietary Essence of Jamaica Ginger :

Jamaica Ginger, in moderately fine powder, 16 ounces av.
Alcohol, a sufficient quantity.

Moisten the powder with Alcohol, pack firmly in a water-bath percolator, pour upon it sufficient Alcohol to cover it, and set in a warm place for 2 days, then heat moderately for one hour, and begin to percolate, adding Alcohol to the drug, and continuing the percolation until 14 fl.ounces are obtained, which reserve; continue the percolation with Alcohol until the drug is exhausted, then concentrate the later percolate by distillation to 2 fl.ounces, and add to the reserved portion to make a pint of Fluid Extract of Jamaica Ginger.

This is used as a Flavoring for Soda Water Syrup and other beverages. To make the proprietary Essence of Jamaica Ginger, mix 3 parts of this Extract with 5 parts of Cologne Spirit.

934. **Orris Extract or Essence.**

Orris Root, in moderately fine powder, 4 ounces av.
Cologne Spirit, sufficient to make 1 pint.

Moisten the powder with Cologne Spirit, pack firmly in water-bath percolator, cover with Cologne Spirit, let stand 2 days, then heat moderately 1 hour, and percolate with Cologne Spirit until a pint has passed. Used for flavoring and in compound perfumes. It has the odor of violets.

935. **Sherbet Extract or Essence.**

Vanilla Extract (940), 6 fl.ounces.
Oil of Orange, fresh, 3 fl.drachms.
Oil of Rose, 3 minims.
Acetate of Amyl, 1 fl.drachm.
Cologne Spirit, 8 fl.ounces.

Mix them, and filter.

936. **Tonka Extract or Essence.**

Tonka Beans, in fine powder, 4 ounces av.
Cologne Spirit, sufficient to make 1 pint.

Moisten the powder with the Cologne Spirit, pack firmly in the water-bath percolator, cover with Cologne Spirit, and let stand for 2 days, then heat moderately and percolate with Cologne Spirit until a pint has passed.

This was formerly much used to combine with Vanilla for making a cheap Vanilla Extract, but is now rapidly going out of use. It is considerably employed in perfumery.

937. Vanilla Extract or Essence.

A great variety of Extracts of Vanilla are found on the market, and as it is one of the most important Extracts, the selection of the beans for preparing it, and the manner of making, should be well understood.

The Mexican Vanilla Beans have the finest flavor, and the longer the bean, as a rule, the better the Extract; but owing to the increased value of the longer beans they are seldom used by the large manufacturers.

The Bourbon Beans are considerably used, but they have a ranker flavor, more like Tonka, and a first-class Extract cannot be made from them alone. They are, however, used to mix with the Mexican Beans, and give a strength to the flavor, which is considered desirable by some manufacturers, but is not liked by the best judges of Good Vanilla Extract.

Owing to the high price of Vanilla Beans, they are liable to manipulation in the hands of unscrupulous jobbers, and an Extract is frequently made by soaking the whole beans in spirits, then drying and selling them. They are then brittle and lighter colored, and are practically worthless. The best way is to buy them of reliable houses only.

Several strengths of Vanilla Extracts are made. One containing 4 ounces to a pint being usually called Fluid Extract of Vanilla; one, containing 2 ounces to the pint, being called Concentrated Extract of Vanilla, chiefly used by confectioners and for flavoring soda water, etc.; and one for the popular trade, usually made 1 ounce to the pint, and called by any name that the manufacturers chose to give it. Besides these, which rank as first-class, and vary only in strength, are the Extracts made of Vanilla and Tonka, or of poorer quality of beans, which are much sold by grocers and also by druggists. The following are the formulæ:

938. Fluid Extract of Vanilla.

Vanilla Beans, cut fine,	4 ounces av.
Cologne Spirit,	12 fl.ounces.
Water, sufficient to make	1 pint.

The Beans are best cut fine with a dried-beef slicer, or by chopping in a chopping-bowl; they should then be pounded in an iron mortar until they are thoroughly crushed or dessicated, then pack them firmly in the water-bath percolator, and pour upon them 8 ounces of Cologne Spirit mixed with 4 ounces of Water, and set in a warm place for 2 days; then heat moderately for 2 hours, and begin to percolate. When the liquid has ceased to drop add the remaining 4 ounces of Cologne Spirit, mixed with 4 ounces of Water, and continue the percolation, adding Water, if necessary, through the percolator until a pint of the Extract is obtained, then filter.

This Extract is not sold except as a Fluid Extract, or for special use to those who know its strength.

939. Concentrated Extract of Vanilla.

Vanilla Beans, cut fine,	2 ounces av.
Cologne Spirit,	12 fl.ounces.
Water, sufficient to make	1 pint.

Make the same as the preceding.

940. Extract of Vanilla.

This is the Flavoring Extract of Vanilla that is mostly made and sold by druggists and manufacturers when Extract of Vanilla is wanted :

Vanilla Beans, cut fine,	1 ounce av.
Cologne Spirit,	10 fl.ounces.
Water, sufficient to make	1 pint.

Reduce the Cut Beans to a coarse powder by beating in an iron mortar and put them in a pint wide-mouth bottle. Mix the Cologne Spirit with 6 ounces of Water, and pour one third of the mixture upon the Vanilla, and stop with a perforated cork, heat for one hour in a water-bath to about 160° F., pour off the liquid and reserve ; pour on the drugs one third more of the menstruum, and heat as before, adding the liquid to the portion previously reserved. Pour on the remainder of the liquid, heat as before, and add the product to the reserved Extract, then add sufficient Water to the Vanilla in the bottle, heat again and pour off, adding the liquid to the reserved extract to make a pint of the Extract of Vanilla.

In making larger quantities of this Extract, it is best made by water-bath percolation the same as the preceding.

941. Vanilla-Tonka Extract.

Many druggists mix a portion of Tonka with Vanilla to make an Extract of Vanilla. Although it gives a stronger flavor, it is not the same as Vanilla.

This is called by some manufacturers *Fortified Extract of Vanilla*, but those who are accustomed to the true Vanilla flavor think but little of it. It may be made by using :

Vanilla Beans,	$\frac{3}{4}$ ounce.
Tonka Beans,	$\frac{1}{4}$ ounce.
Alcohol,	10 fl.ounces.
Water, sufficient to make	1 pint.

Make in the same manner as Extract of Vanilla. Some manufacturers use a still larger proportion of Tonka.

Soluble Flavoring Extracts.

Most of the Essences and Extracts made from Essential Oils and substances containing Oleo-resins, are insoluble in aqueous solutions — making cloudy or milky mixtures. It is desirable for many purposes that some of them should make clear solutions when mixed with Water or Syrup. A general formula is therefore given by which any of the Essences made from Oils may be made soluble, and a few special formulæ for others are given.

These Soluble Extracts are mainly used for Soda Water Syrups and for making bottled beverages.

942. General Formula for Soluble Extracts.

The Essential Oil or Oils,	½ fl.ounce.
Cologne Spirit,	9 fl.ounces.
Carbonate of Magnesium,	½ to 1 ounce av.
Water, sufficient to make	1 pint.

Mix the required Oil or Oils with the Cologne Spirit, rub half an ounce of Carbonate of Magnesium to a fine powder, and then with the Water, and add the mixture to the solution, shaking them well together, let stand a few days, shaking occasionally, then filter, adding enough Water through the filter to make a pint. As some Oils are much less soluble than others in aqueous solutions, the filtered product may not make a clear mixture with Water. This may be ascertained by dropping a few drops into a few ounces of Water. If the solution is cloudy it will be necessary to rub the filtrate with more Carbonate of Magnesium and again filter.

943. Soluble Extract of Ginger.

Jamaica Ginger Root, in moderately fine powder, . . .	4 pounds av.
Alcohol, a sufficient quantity.	
Water, a sufficient quantity.	
Carbonate of Magnesium,	3 ounces av.
Carbonate of Sodium (Sal Soda),	1 ounce av.

Pack the Ginger in the water-bath percolator, and pour sufficient Alcohol upon it to cover it, let stand 48 hours in a warm place, then add more Alcohol, heat moderately for 1 hour and begin to percolate, adding Alcohol to the percolator, and continuing the percolation until the drug is exhausted. Reserve the first 4 pints that pass, and concentrate the remainder by distilling off the Alcohol until only a pint of the Extract remains; add this to the percolate reserved. Dissolve the Carbonate of Sodium in 4 pints of Water; rub

the Carbonate of Magnesium to a smooth mixture with the solution, and add the mixture to the Extract. Let stand for several days, with occasional agitation, and finally filter.

This is about half the strength of a Fluid Extract, and makes a clear solution with Syrup or Water. It is used for flavoring Syrup for Soda Water, Ginger Beer, and other beverages. For making the U. S. official Syrup of Ginger, mix 1 fl.ounce of this Extract with 15 fl.ounces of Syrup.

944. **Ginger Ale Extract.**

Jamaica Ginger, in moderately fine powder,	4	pounds av.
Oil of Lemon,	1	fl.ounce.
Oil of Orange,	3	fl.drachms.
Oil of Pimento,	1½	fl.drachms.
Carbonate of Magnesium,	4	ounces av.
Carbonate of Sodium,	1	ounce av.
Caramel Coloring,	2	fl.ounces.
Alcohol, a sufficient quantity.		
Water, a sufficient quantity.		

Pack the Ginger in the water-bath percolator, and pour sufficient Alcohol upon it to cover it, let it stand 48 hours in a warm place, then add more Alcohol, heat moderately for 1 hour and begin to percolate, adding Alcohol to the percolator, and continuing the percolation until the drug is exhausted. Reserve the first 4 pints that pass, and concentrate the remainder by distilling off the Alcohol until only a pint of the Extract remains. Add this to the percolate reserved, then add the Oils to the same.

Dissolve the Carbonate of Sodium in 4 pints of Water, rub the Carbonate of Magnesium with the solution, add the Caramel Coloring, and then add the mixture to the Extract. Let stand several days, with occasional agitation, and finally filter.

This is the popular Ginger Ale Extract so much used as a flavoring for Soda Water Syrups and bottled beverages.

For making Ginger Ale to bottle or charge in a fountain, mix 6 ounces of this Extract with 1½ gallons of Syrup, 7 gallons of Water, 1 ounce solution Citric Acid and 2 ounces Caramel, and charge to 30 pounds. For making *Syrup Ginger Ale* to draw from the fountain, mix 3 ounces of the Extract with 1 gallon Syrup, and add ½ ounce solution Citric Acid.

945. **Soluble Extract of Lemon.**

Oil of Lemon, fresh.	½	fl.ounce.
Carbonate of Magnesium,	¾	ounce av.
Cologne Spirit,	9	fl.ounces.
Water, q. s., or	8	fl.ounces.

Dissolve the Oil of Lemon in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, and add to the solution, let stand a few days, with occasional agitation, then filter, adding enough Water through the filter to make the measure one pint.

For making *Lemon Pop*, etc., mix 8 ounces of this Extract with 2 gallons of Syrup and 8 gallons of Water, add 1 ounce of Citric Acid, and charge to 30 pounds. For Soda Water Syrup, mix 3 ounces with 1 gallon of Syrup, and add 1 ounce Citric Acid Solution.

946. Soluble Extract of Mead.

A great number of formulas have been published for making this popular beverage, some being in the form of Extracts, and others in the form of a Syrup. The following makes a soluble Extract of fine flavor and strength :

Oil of Lemon,	2 fl.ounces.
Oil of Sassafras,	4 fl.drachms.
Oil of Cloves,	3 fl.drachms.
Oil of Wintergreen,	1 fl.drachm.
Oil of Pimento,	1 fl.drachm.
Oil of Cinnamon,	40 minims.
Caramel Coloring,	2 fl.ounces.
Carbonate of Magnesium,	4 ounces av.
Cologne Spirit,	4½ pints.
Water, q. s., or	4 pints.

Dissolve the Oils in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, and add the Caramel Coloring, then add the mixture to the solution, and let stand a few days, shaking occasionally, and filter.

For charging in a fountain or bottling, mix 6 ounces of this Extract with 1½ gallons of Syrup, 7 gallons of Water, and 1 ounce Solution Citric Acid, and charge to 30 pounds.

For making *Syrup of Mead* to draw from the fountain, mix 3 ounces with 1 pint Strawberry or Raspberry Fruit Juice, and ½ ounce Citric Acid Solution, and add enough Syrup to make 1 gallon.

947. Excelsior Mead Extract.

Fluid Extract Sarsaparilla Compound,	4 fl.ounces.
Strawberry Juice (or other Fruit Juice),	4½ pints.
Soluble Mead Extract (946),	8 fl.ounces.
Caramel Coloring,	1 fl.ounce.
Sugar,	5 pounds av.
Cologne Spirit,	12 fl.ounces.

Mix the liquids and dissolve the Sugar in the mixture.

To charge in a fountain, or make *Bottled Mead*, mix $1\frac{1}{2}$ gallons of this Extract with 1 gallon of Syrup and $7\frac{1}{2}$ gallons of Water, and charge to 30 pounds.

For *Excelsior Mead Syrup* to draw from the fountain, mix 1 part with 3 parts of Syrup.

948. Soluble Extract of Orange.

Oil of Orange,	$\frac{1}{2}$ fl.ounce.
Carbonate of Magnesium,	$\frac{3}{4}$ ounce av.
Cologne Spirit,	9 fl.ounces.
Water, q. s., or	8 fl.ounces.

Dissolve the Oil in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, and add to the solution, let stand a few days, shaking occasionally, then filter, adding enough Water through the filter to make the measure a pint.

For making *Orange Syrup* for Soda Water, mix 3 ounces with 1 gallon Syrup and $\frac{1}{2}$ ounce Solution Citric Acid.

949. Soluble Extract of Sarsaparilla.

Oil of Wintergreen,	$2\frac{1}{2}$ fl.drachms.
Oil of Sassafras,	$1\frac{3}{4}$ fl.drachm.
Oil of Anise,	15 minims.
Carbonate of Magnesium,	$\frac{1}{2}$ ounce av.
Cologne Spirit,	9 fl.ounces.
Water, q. s., or	8 fl.ounces.

Dissolve the Oils in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, and add to the solution, let stand a few days, then filter, adding enough Water through the filter to make the measure a pint.

For charging in a fountain, making *Sarsaparilla Pop*, etc., mix 8 ounces of this Extract with 2 gallons of Syrup, 8 gallons of Water, $\frac{1}{2}$ ounce Citric Acid, and 8 ounces Caramel Coloring, and charge to 30 pounds.

For Soda Water Syrup, mix 3 ounces with 1 gallon Syrup, and color with Caramel.

950. Soluble Extract of Tolu.

Balsam Tolu,	$1\frac{1}{2}$ ounce av.
Alcohol,	3 fl.ounces.
Carbonate of Magnesium,	2 ounces av.
Water, a sufficient quantity to make	1 pint.

Dissolve the Balsam of Tolu in the Alcohol by the aid of a water-bath, and rub the solution thoroughly with the Carbonate of Magnesium, then gradually add to the mixture a pint of boiling Water, rubbing them well together, allow the mixture to stand until cold, then filter, adding through the filter sufficient Water to make the measure 16 fl.ounces.

To make *Syrup of Tolu*, mix 2 fl.ounces of this with 14 fl.ounces of Syrup. It is also used to flavor Soda Water Syrup in the same proportion.

951. Soluble Extract of Wintergreen.

Oil of Wintergreen,	3 fl.ounces.
Carbonate of Magnesium,	$\frac{1}{2}$ ounce av.
Cologne Spirit,	9 fl.ounces.
Water, q. s., or	8 fl.ounces.

Dissolve the Oil in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, and add to the solution, let it stand for a few days, shaking occasionally, then filter, adding enough Water through the filter to make the measure a pint.

For charging in a fountain, etc., use the same as Sarsaparilla. For Soda Water Syrup, mix 3 ounces with 1 gallon Syrup.

952. Birch Beer Extract.

Oil Wintergreen,	3 fl.ounces.
Oil Sassafras,	$\frac{1}{2}$ fl.ounce.
Oil Lemon,	$\frac{1}{2}$ fl.ounce.
Oil Cassia,	10 minims.
Catechu,	60 grains.
Carbonate of Magnesium,	3 ounces av.
Caramel Coloring,	2 fl.ounces.
Cologne Spirit,	$4\frac{1}{2}$ pints.
Water, q. s., or	4 pints.

Dissolve the Oils in the Cologne Spirit, rub the Carbonate of Magnesium with the Water, add the Caramel and Catechu, and add the mixture to the solution, let stand several days, with occasional agitation, then filter.

This Soluble Extract is much used by bottlers and for flavoring Soda Water Syrup.

For *Birch Beer* charged in a fountain or bottled, mix 6 ounces with $1\frac{1}{2}$ gallon of Syrup, 2 ounces of Caramel, $\frac{1}{2}$ ounce Solution Citric Acid, 8 gallons of Water, and charge to 30 pounds.

For *Birch Beer Syrup* to be drawn from the fountain, mix 3 ounces with 1 gallon of Syrup, and add $\frac{1}{2}$ ounce Solution Citric Acid. Color with Caramel.

953. Ottawa Beer Extract.

This was formerly a proprietary preparation, but now all the leading Soda Water manufacturers furnish it. A good Extract may be made as follows :

Burdock Root,	1	pound av.
Sarsaparilla,	1	pound av.
Sassafras,	8	ounces av.
Sweet Flag (Calamus),	2	ounces.
Dandelion Root,	6	ounces av.
Caramel Coloring,	1	fl.ounce.
Oil of Wintergreen,	2	fl.drachms.
Oil of Lemon,	2	fl.drachms.
Carbonate of Magnesium,	1	ounce av.
Alcohol,	4½	pints.
Water, q. s. to make	1	gallon.

Grind the drugs to a coarse powder, mix 4 pints of Alcohol with 4 pints of Water, make an Extract by water-bath percolation, reserving the first 7 pints that pass, continue the percolation with water, evaporate the remaining percolate to 1 pint, and add. Dissolve the Oils in 8 fl.ounces of Alcohol, and add; rub the Carbonate of Magnesium with a portion of the Extract, add to the remainder, and, after standing, filter.

For *Ottawa Beer* charged in a fountain, mix 6 ounces with 1½ gallon Syrup, 1 ounce Solution Citric Acid, 2 ounces Caramel, and 8 gallons of Water, and charge to 30 pounds.

For *Ottawa Beer Syrup*, mix 3 ounces with ½ ounce Solution Citric Acid and 1 gallon of Syrup, and color with Caramel.

954. Peruvian Beer Extract.

Fluid Extract of Sarsaparilla Compound,	4	fl.ounces.
Oil of Lemon,	2	fl.drachms.
Oil of Sassafras,	2	fl.drachms.
Oil of Wintergreen,	1½	fl.drachm.
Oil of Spruce,	1	fl.drachm.
Oil of Nutmeg,	½	fl.ounce.
Carbonate of Magnesium,	1	ounce av.
Caramel Coloring,	½	fl.ounce.
Alcohol,	16	fl.ounces.
Water,	16	fl.ounces.

Dissolve the Oils in the Alcohol, rub the Carbonate of Magnesium with the Water, add the Fluid Extract and Caramel, then add the mixture to the solution, and, after standing a few days, with occasional agitation, filter.

Directions for charging, bottling and drawing as a Syrup the same as for Birch Beer.

955. **Root Beer Extract.**

American Sarsaparilla,	16	ounces av.
Sassafras Bark,	12	ounces av.
Dandelion,	12	ounces av.
Sweet Flag (Calamus),	3	ounces av.
Nutmeg,	2	ounces av.
Oil of Wintergreen,	2	fl.drachms.
Oil of Lemon,	2	fl.drachms.
Oil of Spruce,	1	fl.drachm.
Caramel Coloring,	1	fl.ounce.
Carbonate of Magnesium,	1	ounce av.
Alcohol,	4½	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a coarse powder; mix 4 pints of the Alcohol with 4 pints of Water; make an Extract by water-bath percolation, reserving the first 7 pints which pass, and continue the percolation with Water until the drugs are exhausted; evaporate this last percolate to 1 pint, and add to the reserved Extract. Dissolve the Oils in 8 ounces of Alcohol, and mix with the Extract. Rub the Carbonate of Magnesium with a portion of the Extract, and add to the remainder; then add the Caramel, and, after standing a few days, with occasional agitation, filter.

Directions for charging, bottling, and drawing as a Syrup the same as for Ottawa Beer.

956. **Spruce Beer Extract.**

Oil Hemlock, pure,	4	fl.drachms.
Oil Lemon,	1	fl. drachm.
Oil Wintergreen,	½	fl.drachm.
Oil Sassafras,	½	fl.drachm.
Carbonate of Magnesium,	1	ounce av.
Alcohol,	20	fl.ounces.
Water,	12	fl.ounces.

Dissolve the Oils in the Alcohol, rub the Carbonate of Magnesium with the Water, and add to the solution; let stand a few days, with occasional agitation, and filter.

Directions for charging, bottling, and drawing as a Syrup the same as for Birch Beer, except that the color is omitted.

Artificial Fruit Essences or Flavors.

A variety of artificial Fruit Flavors or Essences are made from various ethers, which, when largely diluted, resemble the flavors of fruit to a greater or less degree.

They are considerably used by bottlers and confectioners, and were formerly much used for flavoring soda water syrups, but have now been superseded almost entirely by natural Fruit Juices, which are infinitely better for the purpose.

The strongest preparations of this class are known in the market as Ethers or Fruit Oils, and generally consist of Amyl and Ethyl Oxides, either simple or combined; but the preparations that are generally furnished as Fruit Essences, Extracts, or Flavors are diluted and mixed so as to more closely imitate the real flavor of fruit, some of them being very good imitations, while others are poor representatives of the natural fruit flavors.

The following formulæ represent all the flavors of this kind for which there is a demand, and make them about the same strength as are furnished by the leading manufacturers for this purpose. They may, however, be made stronger or weaker by using more or less Cologne Spirit or Alcohol in making them:

957. Apple Essence or Extract.

Valerianate of Amyl,	1 ½ fl.ounce.
Acetic Ether,	1 fl.drachm.
Aldehyd,	1 fl.drachm.
Cænanthic Ether,	30 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit or Alcohol,	12 fl.ounces.

Mix them. This may also be made by mixing 3 fl.ounces of Valerianate of Amyl (which is also called Apple Oil) with 3 fl.ounces of Glycerin and 10 fl.ounces of Alcohol.

958. Apricot Essence or Extract.

Butyrate of Amyl,	1 fl.ounce.
Valerianic Ether,	½ fl.ounce.
Cænanthic Ether,	1 fl.drachm.
Butyric Ether,	2 fl.drachms.
Oil of Bitter Almond,	20 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them.

959. Banana Essence or Extract.

Acetate of Amyl,	1 ½ fl.ounce.
Butyrate of Amyl,	½ fl.ounce.
Chloroform,	10 minims.
Aldehyde,	30 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them. A very good Essence of Banana may also be made by mixing 3 fl.ounces of Acetate of Amyl with 13 fl.ounces of Alcohol.

960. Blackberry Essence or Extract.

Formic Ether,	2 fl.drachms.
Acetic Ether,	6 fl.drachms.
Butyrate of Amyl,	1 fl.drachm.
Acetate of Amyl,	30 minims.
Blackberry Juice,	3 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	10 fl.ounces.

Mix them, and filter.

961. Black Cherry Essence or Extract.

Benzoic Ether,	4 fl.drachms.
Acetate of Amyl,	1 fl.drachm.
Cinnamic Ether,	1 fl. drachm.
Oil of Bitter Almond,	30 minims.
Black Cherry Juice,	4 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

962. Black Currant Essence or Extract.

Acetic Ether,	1 fl.ounce.
Cinnamic Ether,	1 fl.drachm.
Extract of Orris (934),	2 fl.drachms.
Black Currant Juice,	5 fl.ounces.
Oil of Bitter Almond,	20 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

963. Blueberry Essence or Extract.

Acetic Ether,	2 fl.drachms.
Benzoic Ether,	2 fl.drachms.
CEnanthic Ether,	1 fl.drachm.
Pelargonic Ether,	30 minims.
Blueberry Juice,	5 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

This is also known as *Huckleberry Extract*.

964. Cranberry Ether or Extract.

Acetic Ether,	2 fl.drachms.
Formic Ether,	1 fl.drachm.
Benzoic Ether,	1 fl.drachm.
Wine Vinegar,	2 fl.ounces.
Cranberry Juice,	5 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	8 fl.ounces.

Mix them, and filter.

965. Grape Essence or Extract.

CEnanthic Ether,	1 fl.ounce.
Formic Ether,	1 fl.drachm.
Aldehyd,	1 fl.drachm.
Grape Juice, any variety,	4 fl.ounces.
Glycerin,	2 fl.ounces.
Alcohol,	9 fl.ounces.

Mix them, and filter.

The flavors of different varieties of Grapes may be imparted to this Essence by adding to it 2 fl.drachms of the Oil distilled from the required variety of grape, as Catawba, Sherry, Port, Claret, etc. These Oils are also produced artificially by combining various Ethers.

966. Gooseberry Essence or Extract.

Acetic Ether,	1 ½ fl.ounce.
Benzoic Ether,	2 fl.drachms.
CEnanthic Ether,	1 fl.drachm.
Aldehyd,	1 fl.drachm.
Succinic Ether,	1 fl.drachm.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them.

967. Melon Essence or Extract.

Sebacic Ether,	1 fl.ounce.
Valerianic Ether,	3 fl.drachms.
Butyric Ether,	2 fl.drachms.
Aldehyd,	1 fl.drachm.
Formic Ether,	30 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them.

968. Nectar Essence or Extract.

Butyric Ether,	1 fl.ounce.
Oil of Wintergreen,	60 minims.
Oil of Bitter Almonds,	15 minims.
Extract of Vanilla (940),	3 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	10 fl.ounces.

Mix them, and filter.

969. Nectarine Essence or Extract.

Butyric Ether,	$\frac{1}{2}$ fl.ounce.
Acetic Ether,	$\frac{1}{2}$ fl.ounce.
CEnanthic Ether,	$\frac{1}{2}$ fl.ounce.
Formic Ether,	$\frac{1}{2}$ fl.ounce.
Valerianic Ether,	$\frac{1}{2}$ fl.ounce.
Sebacic Ether,	1 fl.drachm.
Aldehyd,	1 fl.drachm.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them.

970. Orgeat Essence or Extract.

Oil of Bitter Almonds,	2 fl.drachms.
Acetic Ether,	2 fl.drachms.
Butyric Ether,	4 fl.drachms.
Orris Extract (934),	15 fl.ounces.

Mix them.

971. Peach Essence or Extract.

Ænanthic Ether,	4 fl.drachms.
Acetic Ether,	4 fl.drachms.
Butyrate of Amyl,	2 fl.drachms.
Valerianic Ether,	2 fl.drachms.
Oil of Bitter Almonds,	20 minims.
Peach Juice,	4 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

972. Pear Essence or Extract.

Acetate of Amyl,	1 fl.ounce.
Acetic Ether,	4 fl.drachms.
Glycerin,	2 fl.ounces.
Pear Juice,	2 fl.ounces.
Cologne Spirit,	11 fl.ounces.

Mix them, and filter. The Essence of Jargonelle Pear is made the same as this, only using 30 drops of Acetic Ether.

973. Pineapple Essence or Extract.

Butyrate of Amyl,	4 fl.drachms.
Butyric Ether,	2 fl.ounces.
Sebacic Ether,	4 fl.drachms.
Acetic Ether,	2 fl.drachms.
Acetate of Amyl,	2 fl.drachms.
Pineapple Juice,	2 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	12 fl.ounces.

Mix them, and filter. A very fair Essence of Pineapple is made by mixing 2 ounces of Butyric Ether with 12 ounces of Cologne Spirit and 2 ounces of Water.

974. Plum Essence or Extract.

Acetic Ether,	$\frac{1}{2}$ fl.ounce.
Aldehyd,	$\frac{1}{2}$ fl.ounce.
Butyric Ether,	2 fl.drachms.
Formic Ether,	1 fl.drachm.

Oil of Bitter Almond,	30	minims.
Plum Juice,	3	fl.ounces.
Glycerin,	2	fl.ounces.
Cologne Spirit,	9	fl.ounces.

Mix them, and filter.

975. Prune Essence or Extract.

Acetic Ether,	½	fl.ounce.
Aldehyd,	½	fl.ounce.
Ænanthic Ether,	2	fl.drachms.
Butyric Ether,	1	fl.drachm.
Formic Ether,	1	fl.drachm.
Prune Juice,	3	fl.ounces.
Glycerin,	2	fl.ounces.
Oil Bitter Almond,	20	minims.
Cologne Spirit,	10	fl.ounces.

Mix them, and filter.

976. Quince Essence or Extract.

Pelargonic Ether,	1	fl.ounce.
Aldehyd,	1	fl.drachm.
Chloroform,	1	fl.drachm.
Quince Juice,	3	fl.ounces.
Glycerin,	2	fl.ounces.
Cologne Spirit,	10	fl.ounces.

Mix them, and filter.

977. Raspberry Essence or Extract.

Butyrate of Amyl,	2	fl.drachms.
Acetic Ether,	2	fl.drachms.
Benzoic Ether,	1	fl.drachm.
Ænanthic Ether,	1	fl.drachm.
Formic Ether,	30	minims.
Sebacic Ether,	30	minims.
Acetate of Amyl,	4	fl.drachms.
Extract of Orris,	1	fl.ounce.
Oil of Rose,	2	minims.
Raspberry Juice,	3	fl.ounces.
Glycerin,	2	fl.ounces.
Cologne Spirit,	9	fl.ounces.

Mix them, and filter.

978. Red Cherry Essence or Extract.

Butyrate of Amyl,	2 fl.drachms.
Benzoic Ether,	4 fl.drachms.
Acetate of Amyl,	1 fl.drachm.
Cenanthic Ether,	1 fl.drachm.
Oil of Bitter Almonds,	30 minims.
Red Cherry Juice,	3 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	10 fl.ounces.

Mix them, and filter.

979. Red Currant Essence or Extract.

Acetic Ether,	1 fl.ounce.
Cenanthic Ether,	1 fl.drachm.
Orris Extract,	2 fl.drachms.
Red Currant Juice,	5 fl.ounces.
Oil Bitter Almond,	20 minims.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

980. Strawberry Essence or Extract.

Acetic Ether,	1 fl.ounce.
Butyric Ether,	4 fl.drachms.
Acetate of Amyl,	2 fl.drachms.
Butyrate of Amyl,	2 fl.drachms.
Formic Ether,	1 fl.drachm.
Extract of Orris,	1 fl.ounce.
Strawberry Juice,	3 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	9 fl.ounces.

Mix them, and filter.

981. Wild Cherry Essence.

Benzoic Ether,	4 fl.drachms.
Cenanthic Ether,	1 fl.drachm.
Acetate of Amyl,	1 fl.drachm.
Oil of Cherry Laurel,	30 minims.
Fluid Extract of Wild Cherry,	3 fl.ounces.
Glycerin,	2 fl.ounces.
Cologne Spirit,	10 fl.ounces.

Mix them, and filter.

982. Havana Cigar Flavoring.

Tonka Beans, in fine powder,	2 ounces av.
Valerian, in fine powder,	1 ounce av.
Vanilla Beans, cut fine.	1 ounce av.
Beaver Castor, cut very fine,	2 drachms.
Benzoin, in fine powder,	2 drachms.
Balsam Peru,	2 drachms.
Oil of Cassia,	20 minims.
Oil of Nutmeg,	30 minims.
Valerianic Ether,	1 fl.ounce.
Benzoic Ether,	1 fl.ounce.
Acetate of Amyl,	2 fl.drachms.
Cologne Spirit,	1 pint.

Macerate the Tonka, Valerian, Vanilla, Castor and Benzoin in the Cologne Spirit in a warm place for seven days, then pour off the liquid, put the drugs in a percolator and percolate with the poured off liquid, adding through the percolator enough Cologne Spirit to make 14 fl.ounces, to this add the Oils, Ethers and Balsam, and mix thoroughly.

983. Cachou Flavor.

Oil of Peppermint,	2 fl.ounces.
Oil of Wintergreen,	1 fl.ounce.
Oil of Cassia,	2 fl.drachms.
Oil of Cloves,	1 fl.drachm.

Mix them. By the addition of 2 drachms Oil of Calamus or the same quantity of Oil of Cardamom the flavor is much improved, but they add to the expense.

Aromatic Cachous for the breath are made by mixing powdered Extract of Liquorice 7 parts, powdered Purified Catechu 2 parts, powdered Gum Arabic 1 part, Cachou Flavoring 1 part, with Water sufficient to make a mass, and making into pills which may be coated with silver leaf. *Trév*, a proprietary article, are made in the same manner, but rolled out in sheets and cut in small squares. The flavoring may be varied by adding other aromatic substances, as desired.

984. Essence of Coltsfoot.

Balsam Tolu,	1 ounce av.
Compound Tincture of Benzoin,	3 ounces.
Alcohol,	3 ounces.

Mix the liquids, dissolve the Balsam in the mixture by the aid of gentle heat, and filter. This is used for flavoring Coltsfoot Candy, and as a remedy for coughs.

Bitters Extracts.

These Extracts are used for flavoring Liquors and for making Bitters to bottle. They are dispensed at bars from squirt bottles, by which a few drops may be added to a glass of liquor, and are used as directed for flavoring put-up Bitters, for which druggists have considerable demand :

985. Angostura Bitters Extract.

Angostura Bark,	16 ounces av.
Bitter Orange Peel,	8 ounces av.
Canada Snake Root,	8 ounces av.
Calisaya Bark,	8 ounces av.
Virginia Snake Root,	8 ounces av.
Gentian Root,	4 ounces av.
Galangal Root,	4 ounces av.
Sweet Flag (Calamus),	4 ounces av.
Cardamom Seed,	2 ounces av.
Cinnamon,	1 ounce av.
Cloves,	1 ounce av.
Coriander,	1 ounce av.
Mace,	1 ounce av.
Alkenet Root,	2 ounces av.
Alcohol,	6 pints.
Water, sufficient to make	1 gallon.

Grind the drugs to a moderately fine powder, and moisten them with 2 pints of Alcohol, pack in the water-bath percolator, and, having mixed the remainder of the Alcohol with 4 pints of Water, pour enough of the mixture upon the drugs to cover them, and set in a warm place, let stand 2 days, then pour the remainder of the diluted Alcohol upon them, heat very moderately, and after one hour begin to percolate, adding Water to the drugs, and continuing the percolation until the drugs are exhausted. Reserve the first 7½ pints that pass, evaporate the remainder of the percolate to a ½ pint, and add to the reserved portion to make 1 gallon. This is a very strong Extract.

To make *Angostura Bitters* for bottling, take 2 ounces of this Extract, ¾ gallon Pure Proof Spirit, ¼ gallon Water, 1 ounce Glycerin.

986. Aromatic Bitters Extract.

Bitter Orange Peel,	2 pounds av.
Sweet Flag Root (Calamus),	8 ounces av.
Hops,	8 ounces av.

Cardamom Seed,	2 ounces av.
Cassia Bark,	2 ounces av.
Coriander Seed,	1 ounce av.
Cloves,	1 ounce av.
Mace,	1 ounce av.
Cochineal,	1 ounce av.
Alcohol,	5 pints.
Water, sufficient for	1 gallon.

Grind the Orange and Hops to a coarse powder, and the other articles to a fine powder, mix them, moisten with 1 pint of Alcohol, pack, percolate, and proceed in the same manner as for making Angostura Bitters Extract. This is a pleasant Aromatic Extract.

To make *Aromatic Bitters* to bottle, mix 4 fl.ounces of this Extract with 6 pints Pure Proof Spirit and 2 pints of Water, and add 1 ounce Glycerin.

987. Boker's Bitters Extract.

Quassia,	8 ounces av.
Sweet Flag Root,	8 ounces av.
Bitter Orange Peel,	12 ounces av.
Catechu,	4 ounces av.
Cardamom,	3 ounces av.
Alcohol,	5 pints.
Water, sufficient to make	1 gallon.

Make by water-bath percolation same as the preceding.

988. Orange Bitters Extract.

Fresh Orange Peel, chopped fine,	2 pounds.
Bitter Orange Peel, coarsely ground,	1 pound.
Oil of Orange,	1 fl.ounce.
Cologne Spirit,	6 pints.
Water, sufficient to make	1 gallon.

Mix the Orange Peels, fresh and dry, and cover them with Cologne Spirit, 4 pints; let stand a few days and pour off the liquid, pour on 2 pints fresh Cologne Spirit, macerate as before, and pour off, then pour 3 pints Water upon the drugs, macerate as before, pour off and express. Dissolve the Oil of Orange in the spiritous tincture, and add the last portion obtained by maceration and pressure to it. After standing a few days filter.

To make *Orange Bitters* for bottling, add 8 fl.ounces of this Extract to 6 pints Pure Proof Spirit, 2 pints of Water, and 1 ounce Glycerin.

989. Peruvian Bitters Extract.

Peruvian or Calisaya Bark, in coarse powder,	1½ pound av.
Bitter Orange Peel, in coarse powder,	1 pound av.
Galangal Root, in fine powder,	1 ounce av.
Cinnamon Bark,	2 ounces av.
Nutmeg,	1 ounce av.
Cloves,	1 ounce av.
Alcohol,	6 pints.
Water, sufficient to make	1 gallon.

Make by water-bath percolation the same as Angostura Bitters.

To make *Peruvian Bitters* or *Cinchona Bitters* for bottling, mix 8 fl.ounces of this Extract with 6 pints of Pure Proof Spirit and 2 pints of Water, and add 1 ounce of Glycerin.

990. Stomach Bitters Extract.

Wahoo Bark,	2 pounds av.
Bitter Orange Peel,	1 pound av.
Hops,	8 ounces av.
Juniper Berries,	4 ounces av.
Cardamom Seed,	4 ounces av.
Cinnamon,	3 ounces av.
Cloves,	1 ounce av.
Nutmeg,	1 ounce av.
Alcohol,	6 pints.
Water,	2 pints.

Grind the Wahoo, Orange and Hops to a coarse powder and the other drugs to a fine powder, mix them and make by water-bath percolation as directed for making Angostura Bitters.

To make *Stomach Bitters* for bottling, mix 4 ounces of this Extract with 6 pints of Pure Proof Spirit, and 2 pints of Water, and add 1 ounce of Glycerin.

991. Stoughton Bitters Extract.

Gentian, in coarse powder,	1 pound av.
Virginia Snake Root, in coarse powder,	8 ounces av.
Bitter Orange Peel, in coarse powder,	1 pound av.
Sweet Flag (Calamus), in coarse powder,	8 ounces av.
Cardamom Seed, in fine powder,	4 ounces av.

Cloves, in fine powder,	1 ounce av.
Coriander Seed, in fine powder,	2 ounces av.
Red Saunders, in fine powder,	4 ounces av.
Alcohol,	6 pints.
Water, sufficient to make	1 gallon.

Make by water-bath percolation as directed for Angostura Bitters. This is a strong extract and is to be diluted for use.

992. Wild Cherry Bitters Extract.

Fluid Extract of Wild Cherry,	15 fl.ounces.
Oil of Cherry Laurel,	60 minims.
Cologne Spirit,	1 fl.ounce.

Dissolve the Oil in the Cologne Spirit, and mix with the Extract. A *Wild Cherry Bitters* may be made by mixing 6 ounces of this extract with 6 pints of Pure Proof Spirit, 2 pints of Water, and 1 ounce of Glycerin.

Cordial Essences or Flavors.

The following are familiar Cordials which are used for flavoring Liquors, etc., similar to the foregoing Bitters.

Other Cordials will be found under other headings.

993. Absinthe Essence.

Absinthe is usually made by distillation from the drugs, but a good article may be made from this essence :

Oil of Wormwood,	4 fl.ounces.
Oil of Anise,	2 fl.ounces.
Oil of Fennel,	2 fl.ounces.
Oil of Coriander,	1 fl.drachm.
Cologne Spirit,	8 fl.ounces.

Mix them.

994. Absinthe.—To make Absinthe mix 2 fl.ounces of Absinthe Essence with 5 gallons of Cologne Spirit, and add 5 gallons of water in which 5 pounds of white sugar has formerly been dissolved, then color by adding 2 ounces fluid Extract of Wormwood and sufficient grass-green coloring to give the desired tint, or by macerating 1 pound of fresh Wormwood tops in the liquid. Filter if necessary.

995.

Anisette Essence.

Many formulas, all differing somewhat in flavor, are employed for making Anisette. The following combination will be found as agreeable as any :

Oil of Aniseed,	8 fl.ounces.
Oil of Coriander,	1 fl.drachm.
Oil of Cinnamon,	1 fl.drachm.
Oil of Nutmeg,	30 minims.
Oil of Neroli,	30 minims.
Cologne Spirit,	8 fl.ounces.

Mix them.

996. Anisette or *Anisette Cordial*.—To make Anisette mix 2 fl.ounces of this essence with 4 gallons Cologne Spirit and add to the mixture 5 gallons of water and 15 pounds of white sugar. Let stand and filter through a little Carbonate of Magnesium, if necessary.

997.

Kümmel Essence.

Oil of Caraway Seed,	8 fl.ounces.
Oil of Aniseed,	2 fl.drachms.
Oil of Calamus,	20 minims.
Oil of Coriander,	20 minims.
Oil of Bitter Almond,	20 minims.
Cologne Spirit,	8 fl.ounces.

Mix them.

998. Kümmel.—To make Kümmel mix 2 fl.ounces of Kümmel Essence with 4 gallons of Cologne Spirit and add 5 gallons of water in which 15 pounds of white sugar has previously been dissolved. Let stand and filter through a little Carbonate of Magnesium.

A good Kümmel may also be made by dissolving 1 fl.drachm Oil of Caraway Seed in 3 pints Cologne Spirit, adding 4 pints of water, 1½ pounds of sugar, and filtering through Carb. Magnesium.

Curaçoa Cordial is noticed on page 262. Some other cordials will be mentioned under other headings, but do not properly belong with the foregoing.

ETHYL.

The radical Ethyl is the most important of the series of hydrocarbons, known as the Alcohol radicals.

Its combinations with various acids form a variety of Oxides, which are known as "Ethers," and its combination with the

elements of water forms the Hydrate of Ethyl, which is familiarly known as "Alcohol." See Ethers, page 78, and Alcohol, page 86. As most of the Ethyl Compounds have been noticed under these headings, further description here will be unnecessary.

Ethylamine — $\text{NH}_2(\text{C}_2\text{H}_5)$.— A base of the Ethyl series, obtained by substituting an atom of hydrogen in ammonia by the Ethyl radical.

EXTRACTA — EXTRACTS.

The class of Galenicals known as Extracts or Solid Extracts are preparations usually in the form of mass or powder, and intended to represent in a concentrated form the soluble portions of vegetable drugs. In pharmacy they are used for making pills, plasters, ointments, suppositories, and many other forms of medicine where a concentrated preparation is desirable. Various methods are employed for obtaining the soluble properties of the drugs, as may best be suited to their nature, and their solutions are then concentrated by evaporation in various ways to the required consistence.

In large manufacturing establishments the evaporation is usually conducted *in vacuo*, at a low temperature, as the volatile properties are best preserved in this manner; but as this process is not expedient to the ordinary pharmacist, the formulas here given are designed for such conveniences as may readily be employed by them.

For making small quantities of Solid Extracts the fluid extract of the drug may be evaporated by a water-bath to a pilular consistence.

For prescription work, *Powdered Extracts* are much used and are more convenient than extracts in mass. Many extracts cannot well be reduced to a powder without admixture with other substances, but they are furnished by manufacturers who claim to give a true representative of the extract in the form of powder.

The following formulæ are for Extracts Official in the U. S., Br. and German Pharmacopœias. They represent, however, but a small part of the number of extracts that may be made, for it is evident that extracts may be prepared from all vegetable drugs; but from the formulæ given the intelligent druggist will have no trouble to prepare any extract that may be desired by using the same menstruum for exhausting the drug which is directed for making a Fluid Extract of the same and evaporation in the manner directed for making other Extracts of the same nature.

1001. General Formula for Making Extracts.

The general directions which apply to making all kinds of Extracts, may be briefly stated as follows:

The Substance, any convenient quantity.

The Menstruum, a sufficient quantity.

Moisten the drug with the Menstruum, allow to macerate from 12 to 24 hours, pack in the water-bath percolator, pour Menstruum upon it and set in a warm place for one or two days, then heat moderately, adding the Menstruum or Water to the drug, and percolate until the drug is exhausted. Evaporate the percolate by distillation if it contains alcohol, or by gentle heat if aqueous, to a pilular consistence, adding 5 per cent. of Glycerin to such extracts as become hard and dry after standing, unless wanted in powdered form.

1002. Extracts from Expressed Juices.

Inspissated Juices.

The Extracts made by evaporating the expressed juices of fresh plants have always been considered superior to those made from the dried plants, and the popularity of the English Extracts made by reliable houses in this manner is well known. The following is the general process of the Br. P. for making extracts in this manner:

The fresh leaves, tops or plants, any convenient quantity.

Bruise in a stone mortar and press out the juice, heat it gradually to 130° F. (54°4 C.), and separate the green coloring matter by straining through a calico filter. Heat the strained liquid to 200° F. (93°3 C.) to coagulate the albumen, and again filter through calico. Evaporate the filtered liquid by a water-bath at a low temperature to the consistence of a thin syrup, then add to it the green coloring matter previously obtained, and pass through a hair sieve; then stir together and continue the evaporation at a temperature not exceeding 140° F. (60° C.) until an extract of pilular consistence is obtained.

1003. Extractum Absinthium — *Extract of Wormwood*.—Exhaust Wormwood with Alcohol 2 parts mixed with water 3 parts, by means of the water-bath percolator. Distill off the Alcohol and evaporate the remainder to a thick extract. This is official in the G. P. The dose is $\frac{1}{2}$ to 2 grains.

1004. Extractum Aconiti — *Extract of Aconite Root*.—Exhaust Aconite Root with Alcohol by means of the water-bath percolator, distill off the Alcohol until a thick extract remains, to which add 5 per cent of its weight of Glycerin and mix thoroughly. Official in the U. S. and G. P. Dose $\frac{1}{8}$ to $\frac{1}{4}$ grain.

1005. Extract of Aconite Leaves.—This is official in the Br. P., and is made by bruising the fresh leaves and flowering tops of Aconite, expressing the juice, heating, evaporating, etc., as directed (1002). The dose is $\frac{1}{4}$ to 1 grain.

It was formerly official in the U. S. P. and was made by exhausting the dried Aconite Leaves with diluted Alcohol, distilling off the Alcohol and evaporating the residue to a solid extract.

1006. Extractum Aloes — *Extract of Aloes*.—Dissolve Aloes 1 part in Boiling Water 10 parts, and strain. Set aside for 12 hours, then pour off the clear liquid from the residue and evaporate by a current of warm air or by the heat of a water-bath to dryness. The dose is from 2 to 6 grains.

The U. S. P. calls this *Aqueous Extract of Aloes*; the Br. directs an Extract both of Barbadoes and Socotrine Aloes.

1007. Extractum Arnice Radicis — *Extract of Arnica Root*.—Exhaust Arnica Root with Diluted Alcohol, distill off the Alcohol and evaporate the remainder to a thick extract, add 5 per cent. of its weight of Glycerin, and mix thoroughly.

An Extract of *Arnica Flowers* is made in the same manner. Extract of Arnica is used in making plasters.

1008. Extractum Belladonnæ Alcoholicum — *Alcoholic Extract of Belladonna*.—The U. S. P. directs this to be made from Belladonna Leaves, while the Br. P. directs the Root to be used; the following formula will do for either: Exhaust the Leaves or Root of Belladonna with Alcohol by means of

the water-bath percolator, distill off the Alcohol until only a soft extract remains, then evaporate to a pilular consistence, add 5 per cent. of its weight of Glycerin and mix thoroughly. Dose $\frac{1}{16}$ to $\frac{1}{4}$ grain.

Under the name *Extractum Belladonnæ* the Br. P. and G. P. direct Extract of Belladonna to be made from the fresh leaves, by bruising, expressing the juice, evaporating, etc., as directed (1002). The same process was official in the 1870 U. S. P. The dose is from $\frac{1}{4}$ to 1 grain.

1009. Extractum Calumbæ—*Extract of Calumba*.—Exhaust Calumba Root with diluted Alcohol, by maceration and pressure with separate portions of the menstruum, mix the liquors, distill off the Alcohol, and evaporate the residue to an extract of pilular consistence. The dose is 2 to 10 grains, Br. P.

1010. Extractum Cannabis Indicæ—*Extract of Indian Cannabis*.—Exhaust Indian Hemp with Alcohol by water-bath percolation, distill the Alcohol from the percolate until an extract of pilular consistence remains. The dose is $\frac{1}{4}$ to 1 grain.

1011. Extractum Cascaræ Sagradæ—*Extract of Cascara Sagrada*.—This is a new extract of the Br. P., and is made by exhausting the drug first with two parts of diluted Alcohol, then with Water by means of water-bath percolation. The Alcohol is then distilled from the first portion of the percolate, and the residue, with the remaining percolate, is evaporated to an extract of pilular consistence. Dose from 2 to 8 grains.

1012. Extractum Cinchonæ—*Extract of Cinchona, Extract of Bark*.—Exhaust Yellow Cinchona by means of the water-bath percolator, first with 2 parts of an alcoholic or partly alcoholic menstruum, then by continuing the percolation with water. Distill the Alcohol from the first portion of the percolate and evaporate the residue together with the remainder of the percolate to an extract of pilular consistence, add 5 per cent. of its weight of Glycerin and mix thoroughly. The dose is 1 to 5 grains.

The German Pharmacopœia directs an *Aqueous Extract of Cinchona* to be made by exhausting the drug with separate portions of water, by maceration and expression, evaporation, etc.; also an *Alcoholic Extract of Cinchona* made with diluted Alcohol in the same manner.

1013. Extractum Cardui Benedicti—*Extract of Blessed Thistle*.—Blessed Thistle is exhausted with boiling water, and the liquid strained and evaporated to pilular consistence. The dose is from 3 to 30 grains. G. P.

1014. Extractum Cascarillæ—*Extract of Cascarilla*.—Exhaust Cascarilla in No. 40 powder with boiling water, strain the liquid and evaporate to pilular consistence. The dose is 2 to 20 grains. G. P.

1015. Extractum Calami—*Extract of Calamus*.—Exhaust Calamus Root in No. 30 powder by percolating in the water-bath percolator, first with diluted Alcohol, then with Water. Distill the Alcohol from the first portion of the percolate and evaporate the residue with the remainder of the percolate to pilular consistence. This is official in the G. P.

1016. Extractum Colchici Radicis—*Extract of Colchicum*.—The U. S. P. directs dried Colchicum Root to be used. The Extract may be made by exhausting the root with 35 per cent. of its weight of Acetic Acid and sufficient Water, with repeated maceration and pressure. The mixed liquids are then strained and evaporated at a low temperature to an extract of pilular consistence.

The Br. P. makes an *Acetic Extract of Colchicum* from the fresh Corms deprived of their coats and crushed, using about 20 per cent. of their weight of Acetic Acid, macerating, pressing and evaporating to pilular consistence. The dose is $\frac{1}{2}$ to 2 grains.

The Br. P. also directs an *Extract of Colchicum* to be made from the juice of the fresh Colchicum Corms by straining and evaporating at a low temperature.

1017. Extractum Colocynthis—*Extract of Colocynth*.—Exhaust the pulp of Colocynth, deprived of seeds, with diluted Alcohol by maceration with separate portions of the Menstruum and expression. Distill off the Alcohol and evaporate the remainder by means of a water-bath to dryness. The dose is $\frac{1}{8}$ to $\frac{1}{4}$ grain.

1018. Extractum Colocynthis Compositum—*Compound Extract of Colocynth*—

Extract of Colocynth,	8 ounces.
Aloes,	25 ounces.
Cardamom in No. 60 powder,	3 ounces.
Resin of Scammony, in fine powder,	7 ounces.
Soap, dried and in coarse powder,	7 ounces.
Alcohol,	5 ounces.

Melt the Aloes on a water-bath, then add the Alcohol, and having stirred the mixture thoroughly, strain it through a fine sieve, which has just been dipped into boiling water. To the strained mixture add the Soap, Extract and Resin, and heat the mixture not to exceed 248°F. , until it is perfectly homogeneous, and a thread taken from the mass becomes brittle when cool. Then remove from the heat, add the Cardamom, mix thoroughly, and cover. This is much used in making Cathartic Pills. The dose is from 3 to 10 grains.

1019. Extractum Conii Alcoholicum—*Alcoholic Extract of Conium*.—The U. S. formula is:

Conium (fruit) in No. 40 powder,	16 ounces av.
Diluted Hydrochloric Acid,	$\frac{1}{2}$ ounce av.
Glycerin and Diluted Alcohol each a sufficient quantity.	

Exhaust the drug with Diluted Alcohol, distill off the Alcohol, add the Diluted Hydrochloric Acid to the remainder, and evaporate by heat of water-bath not exceeding 122°F. to a pilular consistence, to this add 5 per cent. of its weight of Glycerin, and mix thoroughly.

The Br. P. directs it to be made from the Juice expressed from the bruised young branches and fresh leaves of Hemlock, as directed (1002). The dose is from 2 to 6 grains.

1020. Extractum Digitalis — *Extract of Digitalis*. — Exhaust the Digitalis by means of a water-bath percolator, first with 4 parts of a menstruum, consisting of $\frac{2}{3}$ Alcohol, and continue the percolation with Water. Distill the Alcohol from the first portion of the percolate, and evaporate the remainder with the aqueous percolate to the consistence of an Extract. To this add 5 per cent. of its weight of Glycerin, and mix thoroughly. The dose is from $\frac{1}{4}$ to 3 grains.

1021. Extractum Ergotæ — *Extract of Ergot*. — The U. S. P. directs this to be made by evaporating Fluid Extract of Ergot to the consistence of a semi-solid extract by means of a water-bath at a temperature not exceeding 122 F.

Ergotin is purified Extract of Ergot, made by evaporating 4 fl.ounces of Fluid Extract of Ergot by a water-bath to a syrupy consistence, and when cold mixing with 4 fl.ounces of Alcohol. After standing half an hour the alcoholic solution is filtered, and the filtered liquid evaporated to the consistence of a soft extract. This is usually called Bonjean's Ergotin. The dose is 2 to 5 grains. In solution it is used for hypodermic injections.

1022. Extractum Euonymi — *Extract of Euonymus (Wahoo)*. — Exhaust Wahoo Bark with diluted Alcohol. Distill off the Alcohol, evaporate the remainder to the consistence of a solid extract, add 5 per cent. of its weight of Glycerin, and mix them thoroughly.

1023. Extractum Ferri Pomatum — *Ferrated Extract of Apples* — (*Apfelsaures Eisenextract*). — This is official in the G. P., and is made from Sour Apples, 50 parts converted to a pulp and expressed. To the expressed juice is added powdered Iron 1 part. The mixture is then heated on a water-bath as long as gas is evolved. The liquid is then diluted with 50 parts of Water and set aside. After several days it is filtered, and the filtrate evaporated to a thick extract. This is much prescribed among the Germans.

1024. Extractum Gelsemium Alcoholicum — *Alcoholic Extract of Gelsemium*. — Gelsemium in fine powder is exhausted first with Alcohol 4 parts, and the percolation then continued with Water. The Alcohol is distilled from the first percolate until it is reduced to a soft extract, the aqueous percolate is then evaporated and mixed with the soft extract, and the whole is reduced to a pilular consistence. The dose is $\frac{1}{2}$ to 2 grains.

1025. Extractum Gentianæ — *Extract of Gentian*. — Gentian Root in very coarse powder is macerated in successive portions of boiling water, expressed, and the mixed liquids evaporated to a pilular consistence. The dose is from 2 to 10 grains.

1026. Extractum Glycyrrhizæ Pura — *Pure Extract of Liquorice*. Exhaust Liquorice Root in coarse powder first with water in which 12 per cent. of the weight of the root of Water of Ammonia has been added, then with water until no more strength is perceptible. Heat the liquids obtained to boiling, then strain and evaporate by a water-bath to a solid extract.

Crude or common Extract of Liquorice is made by exhausting Liquorice with water and evaporating to an extract.

1027. Extractum Hæmatoxyli — *Extract of Logwood*.—Exhaust Logwood with hot water, boil, strain, and evaporate the liquid to a solid extract. Dose 10 to 30 grains.

1028. Extractum Hyoscyami Alcoholicum — *Alcoholic Extract of Hyoscyamus*. The U. S. P. directs recently dried Hyoscyamus leaves, which may be exhausted by means of the water-bath percolator by percolating first with 4 parts of a menstruum of two-thirds Alcohol and then with Water. The Alcohol is distilled from the first portion of the percolate and the residue together with the aqueous percolate evaporated by water-bath to pilular consistence. The dose is 5 to 10 grains.

The Br. P. directs the juice of the fresh leaves to be obtained by bruising them and pressure, and evaporated, strained, etc., in the same manner as is directed (1002).

1029. Extractum Helenii — *Extract of Inula (Elecampane)*.—Exhaust Inula in No. 40 powder by percolating in the water-bath percolator, first with Diluted Alcohol, then with water, distill the Alcohol from the first portion of the percolate and evaporate the residue with the remainder of the percolate by water-bath, to pilular consistence. The dose is from 2 to 15 grains. This is official in the G. P.

1030. Extractum Iridis — *Extract of Iris (Blue Flag)*.—Exhaust the drug by water-bath percolation, first with Alcohol 4 parts, and then by percolating with Diluted Alcohol. Distill off most of the Alcohol and evaporate the residue by means of a water-bath to pilular consistence. The dose is $\frac{1}{4}$ to 1 grain. U. S.

1031. Extractum Jaborandi — *Extract of Jaborandi*.—Percolate the drug in the water-bath percolator first with Alcohol 4 parts and then with Water until exhausted. Distill the Alcohol from the first percolate until only a soft extract remains, evaporate the aqueous percolate and, having mixed the extracts thus obtained, reduce them to pilular consistence. The dose is 2 to 10 grains. This extract is official in the Br. P.

1032. Extractum Jalapa — *Extract of Jalap*.—Exhaust Jalap by means of water-bath percolation first with 4 times its weight of Alcohol and then with Water, distill the Alcohol from the first portion of the percolate until only a soft extract remains, then evaporate the aqueous percolate, and having mixed the two extracts thus obtained reduce them to pilular consistence. The dose is from 5 to 15 grains. This extract is official in the Br. P.

1033. Extractum Juglandis — *Extract of Juglans (Butternut Bark)*.—Exhaust the Bark of Butternut Root with Alcohol by means of water-bath percolation. Distill off the Alcohol until the residue is reduced to a pilular consistence; to this add 5 per cent. of its weight of Glycerin and mix thoroughly. The dose is 2 to 10 grains.

1034. Extractum Krameriae — *Extract of Rhatany.*—Exhaust the Rhatany Root by percolating in the water-bath percolator with hot water. Heat the percolate to boiling, strain and evaporate by a water-bath at a temperature not exceeding 158° F. to dryness. The dose is from 5 to 20 grains.

1035. Extractum Lactuæ — *Extract of Lettuce.*—The Br. P. directs this to be made from the fresh flowering herb of Lettuce, by bruising, expressing the juice and evaporating, treating in the same manner as is directed (1002). The dose is from 5 to 15 grains.

1036. Extractum Leptandræ — (*Extract of Leptandra Culvers Root.*)—Exhaust Leptandra by percolating in the water-bath percolator, first with a menstruum of two thirds Alcohol and then with water. Distill the Alcohol from the first portion of the percolate and evaporate the residue together with the aqueous percolate, by means of a water-bath to a pilular consistence, to this add 5 per cent. of Glycerin and mix thoroughly. The dose is 2 to 10 grains.

1037. Extractum Lupuli — *Extract of Hop.*—The hops are first percolated in the water-bath percolator with Alcohol, 4 parts, and then with water until exhausted. Distill the Alcohol from the first portion of the percolate and evaporate the aqueous percolate to a soft extract, mix the two extracts, and evaporate to a pilular consistence. The dose is 5 to 15 grains. This is official in the Br. P.

1038. Extractum Malti — *Extract of Malt.*—Exhaust coarsely ground Malt in a water-bath percolator with water heated to about 60°C. (140°F.) and as the percolate is received evaporate it by the heat of a water-bath not exceeding 60°C. (140°F.) until it is reduced to the consistence of a thick syrup. It is necessary in making this preparation to begin the evaporation at once as the percolate is received, and to continue it at a temperature as uniform as possible until it is evaporated to the proper consistence, for upon this depends the preservation of the *Diastase* which is its important constituent. Extract of Malt is combined with many other preparations, which may be added to it in concentrated form. These combinations will be noticed under the heading MALTUM, which see.

1039. Extractum Mezerei — *Extract of Mezereum.*—The U. S. P. directs an Alcoholic Extract, which may be prepared by exhausting Mezereum Bark in No. 30 powder, with Alcohol, by means of the water-bath percolator, and then distilling the Alcohol from the percolate until only a soft extract remains, and evaporating this by a water-bath to pilular consistence.

The Br. P. directs an *Ethereal Extract of Mezereon* to be prepared in a similar manner as the above, but after being thus prepared, to dissolve the Extract in Ether and macerate with occasional agitation for 24 hours, then to decant the ethereal solution, recover part of the Ether by distillation, and evaporate the remaining liquid to a soft extract.

1040. Extractum Nucis Vomicae — *Extract of Nux Vomica.*—Exhaust rasped or powdered Nux Vomica by percolating in the water-bath percolator

with a menstruum composed of 8 parts of Alcohol to 1 part of water. Distill off the Alcohol and evaporate the residue, by a water-bath, to a pilular consistence.

The Br. P. directs an assayed Extract of Nux Vomica to be made which shall contain 15 per cent. of the total alkaloid. The dose is from $\frac{1}{4}$ to 2 grains.

The G. P. directs the Nux Vomica to be exhausted by digesting with diluted Alcohol, and the liquors to be evaporated to a dry extract.

1041. Extractum Opii—*Extract of Opium*.—Exhaust Opium by first macerating with boiling Water, until it is reduced to a pulp, then percolating with hot water in the water-bath percolator. Evaporate the percolate, strain and continue the evaporation until reduced to an extract, to which add 5 per cent. of Glycerin and mix thoroughly. The extract should contain about 20 per cent. of Morphine. The dose is $\frac{1}{2}$ to 2 grains.

1042. Extractum Papaveris—*Extract of Poppy*.—Exhaust Poppy Capsules, freed from their seeds and in No. 20 powder, with successive portions of boiling water. Evaporate the liquors by a water-bath to a pint for each pound of the capsules used, to this add 2 fl.ounces of Alcohol, allow to stand 24 hours, then filter and evaporate the filtered liquid to pilular consistence. The dose is 2 to 5 grains. Br. P.

1043. Extractum Pareiræ—*Extract of Pareira*.—Exhaust Pareira Root in No. 40 powder by percolating in the water-bath percolator with boiling Water, and evaporate the percolate by a water-bath to pilular consistence. The dose is from 10 to 30 grains. Br. P.

1044. Extractum Physostigmatis—*Extract of Physostigma (Calabar Bean)*.—Exhaust Calabar Bean in No. 40 powder with Alcohol, by means of the water-bath percolator, and evaporate the percolate by distillation to the consistence of a pilular extract. The dose is $\frac{1}{16}$ to $\frac{1}{4}$ grain.

1045. Extractum Podophylli—*Extract of Podophyllum (Mandrake)*.—Exhaust Mandrake Root in No. 60 powder by percolating in a water-bath percolator first with a menstruum of 75 per cent. Alcohol, then with Water. Distill off the Alcohol from the first percolate and evaporate the residue with the remaining percolate to pilular consistence. The dose is $\frac{1}{2}$ to 2 grains.

1046. Extractum Quassiæ—*Extract of Quassia*.—Exhaust Quassia by means of a water-bath percolator with boiling Water, and evaporate the percolate by a water-bath to pilular consistence, to this add 5 per cent. of its weight of Glycerin and mix thoroughly. The dose is from 2 to 5 grains.

1047. Extractum Rhamni Frangulæ—*Extract of Frangula or Buckthorn Bark*.—Exhaust Buckthorn Bark in No. 40 powder by percolating in a water-bath percolator, first with Diluted Alcohol and then with Water. Distill the Alcohol from the first portion of the percolate and evaporate the residue together with the remaining percolate to pilular consistence. Dose. 10 to 60 grains.

1048. Extractum Rhei—*Extract of Rhubarb*.—Exhaust Rhubarb in No. 30 powder by percolating in a water-bath percolator first with Diluted Alcohol and then with water. Distill the Alcohol from the first portion of the percolate and evaporate the residue together with the remainder of the percolate by a water-bath, at a temperature not exceeding 70° C. (158° F.) to pilular consistence. The dose is from 5 to 15 grains. This may also be prepared by macerating with successive portions of Water and pressure, then evaporating the liquids as above.

1049. Extractum Rhei Compositum—*Compound Extract of Rhubarb*.—This is made according to the G. P. from—

Extract of Rhubarb,	30 parts.
Extract of Aloes,	10 parts.
Resin of Jalap,	5 parts.
Medicinal Soap,	20 parts.

Rub them together, and, having moistened the mixture with Diluted Alcohol, evaporate to a dry extract by means of a steam-bath.

1050. Extractum Sabinæ—*Extract of Savine*.—Exhaust Savine with Diluted Alcohol by means of the water-bath percolator. Distill off the Alcohol and evaporate the percolate, by a water-bath, to a thick extract. The dose is 2 to 15 grains. G. P.

1051. Extractum Scillæ—*Extract of Squill*.—Macerate Squill with separate portions of Diluted Alcohol and express. Mix the liquids, distill off the Alcohol, and evaporate the residue to a thick extract. The dose is $\frac{1}{2}$ to 2 grains. G. P.

1052. Extractum Stramonii—*Extract of Stramonium*.—Exhaust Stramonium Seed in No. 40 powder with diluted alcohol by percolating in the water-bath percolator. Distill the Alcohol from the percolate and evaporate the residue at a temperature not exceeding 50° C. (122° F.) by means of a water-bath to a pilular consistence. The dose is $\frac{1}{4}$ to $\frac{1}{2}$ grain.

1053. Extractum Taraxaci—*Extract of Dandelion*.—Fresh Dandelion Root, gathered in September, is cut fine, crushed in a mortar until reduced to a pulp, a little water added, and the juice expressed and allowed to deposit. It is then strained and heated to boiling, strained again and evaporated to pilular consistence. The dose is from 5 to 30 grains.

1054. Extractum Trifolii Fibrini—*Extract of Buckbean*.—Exhaust Buckbean with boiling water, strain and evaporate the liquid to a thick extract. This is official in the G. P.

1055. Extractum Tritici—*Extract of Couch Grass*.—Exhaust Triticum with boiling water, strain and evaporate the liquid to a thick extract. This is official in the G. P. under the name *Extractum Graminis*.

1056. Extractum Valerianæ—*Extract of Valerian*.—Exhaust Valerian Root in No. 40 powder by percolating in the water-bath percolator with

75 per cent. Alcohol, then with water. Distill the Alcohol from the first portion of the percolate, and evaporate the residue with the remainder of the percolate, by water-bath, at a temperature not exceeding 50°C. (122°F.) to a pilular consistence. Dose 2 to 20 grains. Although this extract is not official, it is more frequently used than many of those which are.

1057.

Other Extracts.

The foregoing Extracts, official in the U. S., Br. and German Pharmacopœias are all that are usually required. But a great number are quoted by manufacturing houses, and may be made by druggists in the same general manner as is directed for the Official Extracts, by using for exhausting the drug the same menstruum as is directed for making a fluid extract of the drug.

EXTRACTA DESTILLATA—DISTILLED EXTRACTS.

In American Pharmacy only two or three Distilled Extracts are known, and none are official; but from the favor with which Distilled Extract of Witch Hazel has been received, it is evident that many such Distilled Extracts might with advantage be made. In French Pharmacy under the name *Alcoolats* quite a large number of preparations made by distilling aromatic substances with a spiritous medium are known, and several of them are official.

All drugs whose valuable medicinal properties are volatilized by the heat of boiling alcohol or water, and do not consist of essential oils which rise to the surface when cool, may be represented in the form of Distilled Extracts.

For making these Extracts the steam still, by which steam may be forced through the substances, is the best; but for pharmaceutical use they may be distilled with the low shape still described on page 26 in the same manner as is directed on page 27 for distilling medicated waters from leaves, etc. A wire-cloth basket should be suspended in the boiler in which the drugs should be placed to preserve the drug from too close contact with the heat.

A few formulas only are given as samples from which the druggist may make any desired extract:

1058. **Extractum Hamamelidis Destillatum.**

Distilled Extract Witch Hazel.

Witch Hazel Leaves, fresh,	2 pounds av.
Water,	1 gallon.
Alcohol,	8 fl.ounces.

Bruise the leaves in a mortar, pour the Alcohol upon them; put them in the still without the water-bath, add the Water and distill 2 pints. This may also be made by distilling with Water alone and then adding to the distillate 25 per cent. of Alcohol.

Distilled Extract of Horseradish, Scurvy Grass, Mustard, Nasturtium, Smartweed, and all other substances possessing like volatile principles, may be made in a similar manner.

1059. **Extractum Buchu Destillatum.**

Distilled Extract Buchu.

Buchu Leaves,	1 pound av.
Water,	1 gallon.
Alcohol,	8 fl.ounces.

Moisten the Buchu leaves with the Alcohol and put them in the still without the water-bath, add the water and distill 2 pints. A great variety of similar aromatic dry substances may be treated in the same manner.

1060. **Extractum Pruni Virginianæ Distillatum.**

Distilled Extract Wild Cherry.

Wild Cherry Bark, of root, fresh,	2 pounds av.
Water,	1 gallon.
Alcohol,	8 fl.ounces.

Bruise the bark, pour the Alcohol upon it and put in the still without the water-bath, pour the water upon it and distill 2 pints. This may also be made from the dry bark 1 pound, Alcohol 8 ounces, Water 1 gallon, and distill 2 pints, in the same manner as Extract Buchu.

Other extracts of similar substances, whose virtues consist of volatile principles, may be made in the same manner.

Alcoolats or Alcoholates.

These are extracts made in a similar manner, but with a much larger proportion of Alcohol. Many substances con-

taining essential oils are distilled with alcohol and represented in this manner. When made from the Oils they would be classed as spirits. The following formulæ are examples. In French Pharmacy they are variously called *Espirit* or *Eau* without reference to their Alcoholic strength or composition :

1061. Alcoolat d'Absinthe. — Fresh leaves and tops of Wormwood 1,000 parts, Alcohol 80 per cent., 4,000 parts, distilled Wormwood water 1,000 parts. Let them macerate for 4 days, then distill by a salt water-bath, 2,500 parts. Alcoolats of Sweet Basil, Hysop, Lavender, Marjorum, Balm, Peppermint, Spearmint, Sage, Thyme and other similar fresh substances are prepared in the same manner.

1062. Alcoolat d'Anis. — Aniseed 1 part, Alcohol 56 per cent., 5 parts, Let them macerate for two days then distill until all the Alcohol used is recovered. Alcoolats of Caraway, Coriander, Fennel, Spice and other similar substances are prepared in this manner.

1063. Alcoolat de Cannelle (Cinnamon).—Cinnamon Bark ground fine 1 part, Alcohol 80 per cent., 5 parts. Let macerate 4 days then distill until all the Alcohol used is recovered. Alcoolats of Angelica, Calamus, Mace, Sassafras, Cloves, and a great variety of other strong aromatic substances are made in a similar manner.

The foregoing formulæ will be sufficient to show the general method of making the Alcoolats of French Pharmacy. Many more are known and used, but they are seldom called for in this country, and generally the simple spirits or essences of the substances will do when simple Alcoolats are desired; of the compound Alcoolats so few are used here that it seems unnecessary to give their formulas.

EXTRACTA FLUIDA — FLUID EXTRACTS.

Fluid extracts are of American origin, and our Pharmacopœia is the only one which recognizes preparations by this name. The British Pharmacopœia has a few "Liquid Extracts," some of which are similar to Fluid Extracts, but this class of preparations may be claimed as distinctly American.

Fluid Extracts aim to represent the entire soluble medicinal constituents of a certain weight of drug in an equivalent fluid

measure. As such, they are the most convenient of the galenicals, for they may be used in place of the drugs themselves in making many preparations extemporaneously that would otherwise require considerable time to prepare. They are also very convenient to prescribe, as the dose is the same as of the powdered drug or substances from which they are prepared.

Since the introduction of Fluid Extracts, some forty years ago, many methods for making them have been proposed, all having in view the same object, viz.: To represent the entire medicinal value of a specified weight of the drug in an equivalent quantity of Fluid Extract. While in main, this may readily be done, yet it must be borne in mind that the *entire* medicinal value of *some* drugs cannot be held in solution in an equivalent fluidmeasure of Fluid Extract, by the menstruums usually employed for making them.

A brief description of the principal methods which have heretofore been employed for making Fluid Extracts, is given for the convenience of our readers, but the process of water-bath percolation presents great advantages over any other, and is therefore employed in the formulæ for the preparations. It is, in fact, the only process by which first-class fluid extracts can be made economically, in a small way, by druggists.

The value of a fluid extract depends upon the amount of active medicinal agent that it contains, and the formulæ given are designed to best secure that end, without producing preparations loaded with inert and worthless extractive matter as is often the case with those furnished by manufacturers.

The formulas are each calculated to make a pint of fluid extract, but larger quantities may be made somewhat more advantageously.

In making large quantities it may not be necessary to continue the heat so long as is directed, as the water-bath will retain its heat for some time, when once heated.

When Fluid Extracts are used for making Tinctures, Infusions, Syrups, etc., fluidmeasure equivalent to the weight of the drug, or drugs directed, may be used. Solid extracts may be made from nearly all the fluid extracts by evaporating them to the proper pilular consistence.

The following are the principal popular methods that have been employed or directed for making fluid extracts :

1064.

U. S. 1870 Process.

"The quantity of powdered material directed to be used is 16 troyounces. This powder is to be moistened with a specified quantity of menstruum, and properly packed in a suitable percolator. The surface of the powder is then to be covered with a disc of paper, and the remaining portion of 16 fluidounces of menstruum is to be poured upon it. When the liquid begins to drop from the percolator, close the lower orifice with a cork, and, having closely covered the percolator to prevent evaporation, set it aside in a moderately warm place for four days.

"The cork is then to be removed, more menstruum is to be gradually poured on, and the percolation continued until 24 fluidounces have been obtained. Of these, the first 14 fluidounces are to be reserved, and the remainder having been carefully evaporated to two fluidounces, is to be mixed with the reserved portion, and filtered through paper if necessary."

The quantity of drug directed in the 1870 formulæ is about 5 per cent. more than the equivalent fluid measure of the fluid extract obtained, the difference being the same as between troyweight and fluid measure.

1065.

U. S. 1880 Process.

No general formula is given in the 1880 Pharmacopœia for making fluid extracts, each drug having a detailed formula for itself; but from them the following general formula may be deduced:

100 grammes of the powdered material directed to be used are moistened with from 30 to 50 grammes of menstruum (according to the nature of the drug), and properly packed in a suitable percolator; enough menstruum is then added to saturate the powder, and leave a stratum above it. When the liquid begins to drop from the percolator, the lower orifice is closed, the percolator covered, and its contents allowed to macerate for 48 hours. The stopper is then loosened, and the percolation allowed to proceed gradually, adding first the remainder of 100 grammes of the menstruum, which has not previously been used, and then more menstruum, as is directed in the formula until the drug is exhausted. The first 85 cubic centimetres of the percolate received are reserved and, by means of a water-bath and still the Alcohol is recovered from the remainder, and the residue evaporated to a soft extract; this soft extract is then dissolved in the reserved portion, and enough menstruum (as is directed in the formula) added to make the fluid extract measure 100 cubic centimetres.

Fluid extracts made by this process represent the medicinal value of a gramme of a drug in a cubic centimetre, therefore the weight of the drug and fluid measure of the fluid extract are equivalent.

1066.

Repercolation Process.

The following is an abstract of Squibb's method of Fractional or Repercolation. This process is probably the best cold process in use, but it is too tedious to be generally employed by druggists; some skill and experience are required to use it successfully:

To make 3 pints of a fluid extract take of

The required drug, or drugs, in powder as directed, 50 ounces av.

The required menstruum as directed, a sufficient quantity.

First.—Take $\frac{1}{3}$ of the powder ($16\frac{2}{3}$ ounces avoird.) and 3 pints of the menstruum required. Moisten the powder with from 6 to 8 fl.ounces of the menstruum, pack it properly in a suitable percolator, pour upon it sufficient menstruum to saturate the drug and leave a stratum above it, and when the percolate begins to drop, close the lower orifice and allow to macerate from two or three days; then begin to percolate, adding the remainder of the menstruum (and more if necessary) to the powder, continuing the percolation until the drug is exhausted, receiving the percolate as it passes in the following manner:

Reserve the first 12 fl.ounces,	. . . . .	mark <i>a</i> .
the next 6 fl.ounces,	. . . . .	mark <i>b</i> .
the next 8 fl.ounces,	. . . . .	mark <i>c</i> .
the remainder of the percolate,	. . . . .	mark <i>d</i> .

The last portion, *d*, is a variable quantity, but should be from 20 to 30 fl.ounces. With some drugs this may be forced through by adding water through the percolator, while with others the same menstruum must be used throughout.

Second.—Take $\frac{1}{3}$ more of the powder ($16\frac{2}{3}$ ounces avoird.) as before, moisten it with the portion of percolate marked *b*, pack as before, pour upon it the percolate marked *c*, and afterward sufficient of the percolate marked *d* and sufficient fresh menstruum to exhaust the drug, receiving the percolate as follows.

Reserve the first 16 fl.ounces,	. . . . .	mark <i>e</i> .
the next 6 fl.ounces,	. . . . .	mark <i>f</i> .
the next 8 fl.ounces,	. . . . .	mark <i>g</i> .
the remainder of the percolate,	. . . . .	mark <i>h</i> .

The last portion, *h*, is a variable quantity, but should be from 16 to 20 fl.ounces. With some drugs it may be forced out with water, while with others the same menstruum should be used throughout.

Third.—Take the remaining $\frac{1}{3}$ ($16\frac{2}{3}$ ounces avoird.) of the powder; moisten it with the portion marked *f*, pack as before, pour upon it the portion marked *g*, and afterward sufficient of the percolate marked *h* to saturate the powder and leave a stratum above; allow to macerate and

percolate as before, adding the remainder of the percolate marked *h* and sufficient fresh menstruum to exhaust the drug, receiving the percolate as follows :

Reserve the first 20 fl.ounces, mark *i*.
the remainder of the percolate, mark *j*.

Lastly.— Mix the reserved portions, *a*, *e* and *i*, which constitute the fluid extract and reserve the last portion *j*, to moisten and percolate the next batch of drugs to be made into fluid extract of the same kind, marking it repercolate of the drug or drugs from which the fluid extract was prepared.

1067. Pressure Process.

The following is an abstract of N. Spencer Thomas's method of extracting the strength of drugs by maceration and pressure :

Although this process does not entirely exhaust the medicinal strength of the drugs, it produces better extracts than most that are in the market.

First.— Take $16\frac{2}{3}$ ounces avoird. of the drug, of the proper fineness, and menstruum sufficient. Moisten the drug with from 8 to 12 fl.ounces of the menstruum (according to the nature of the drug), and set aside in a wide-mouth jar, or suitable covered vessel. Allow to stand four days, then press out as much as possible with a tincture press, and reserve the product.

Second.— Moisten the same drug, as before, with from 6 to 8 ounces of the menstruum. Allow to stand, and press out as before, adding the product to the portion before reserved.

Third.— Repeat the second operation, adding the product to the portions before reserved.

Fourth.— Repeat the second operation, but so regulate the last amount of menstruum added as to make 1 pint of the fluid extract when added to the portions before reserved. Filter, if necessary.

When this process is employed the drugs should be inclosed in a coarse, canvas cloth or bag before putting in the press. The pressure should be gradual and long continued, that the moisture may be as nearly as possible extracted from the drugs. A 1-gallon tincture press will answer very well for making from 1 to 3 pounds of fluid extract.

Combination Process — Repercolation and Pressure.— A combination of the Repercolation and Pressure process is used by some manufacturers. The percolation is conducted the same as is directed for repercolation, except that the last portions, *d*, *h* and *j*, are obtained by pressure instead of by percolation. It is more economical than repercolation alone, as there is no loss of menstruum in the last part of the percolations, which is quite an important item of the expense of the Fluid Extracts.

1068. Fluid Extracts by Water-Bath Percolation.

To give a detailed formula for every Fluid Extract which is made or known on the market, would require a large volume, and, indeed, it is unnecessary, for they may be classed according to the nature of the drug employed, and a few formulas will represent them all, it being necessary only to insert the name of the drug in the specified formula to adapt it to the particular Fluid Extract being made.

The drugs from which Fluid Extracts are made are therefore divided as far as is practicable into Classes, and a general formula given which is suited to the nature of the drugs in each Class. The formulæ given are by water-bath percolation, which, as previously explained, is considered the best process for making Fluid Extracts. Other processes, however, may be employed by using the menstruum designated for the drug, and proceeding as is directed in the process.

Full detailed formulæ for all the official Fluid Extracts will be found in FENNER'S WORKING FORMULÆ.

Fluid Extracts, Class A.

In this class are included all Fluid Extracts made from drugs requiring Alcohol as a menstruum, except such as require special treatment or manipulation. To complete the formula for any Fluid Extract in this class, put the name of the drug and the fineness of the powder in the following

1069. General Formula.

The Drug in No. . . powder, . . . 16 $\frac{2}{3}$ ounces av.
Alcohol, a sufficient quantity.

Moisten the powder with from 6 to 8 fl.ounces of Alcohol, pack firmly in the water-bath percolator, pour upon it enough Alcohol to saturate and cover the drug and set in a warm

place for two days; then heat very moderately, and after one hour begin to percolate slowly, adding Alcohol to the drug, and continuing the heat and percolation until 14 fl.ounces have passed, which reserve. Turn off the heat and continue the percolation with Alcohol until the drug is exhausted. Distill the Alcohol from this last portion of the percolate until only 2 fl.ounces remain, which add to the reserved portion to make a pint of the Fluid Extract. Lastly, after standing a few days filter through paper or muslin, adding enough Alcohol through the filter to make the measure a pint. If Glycerin is directed to be used it should be added to the first portion of the menstruum used.

The Alcohol remaining in the drug after percolation may be recovered by distillation.

The star (*) before a formula denotes that a Fluid Extract is also made from the green plant. See Green Plant Fluid Extracts.

U. S. Official Fluid Extracts.

The following are the U. S. Official Fluid Extracts made with Alcohol in accordance with this formula :

1070. Extractum Aconiti Fluidum—*Fluid Extract of Aconite*.—Aconite Root in No. 60 powder—Alcohol. Make a fluid extract as directed (1069), and add 30 grains Tartaric Acid to a pint.

1071. Extractum Aromaticum Fluidum—*Aromatic Fluid Extract*.—Aromatic powder—Alcohol. Make a fluid extract as directed (1069).

1072. Extractum Belladonna Fluidum—*Fluid Extract of Belladonna Root*.—Belladonna Root in No. 60 powder—Alcohol. Make a fluid extract as directed (1069). For Fluid Extract Belladonna Leaves see Class C.

1073. Extractum Brayeræ Fluidum—*Fluid Extract of Kouso*.—Kouso Flowers in No. 40 powder—Alcohol. Make a fluid extract as directed (1069).

1074. Extractum Calami Fluidum—*Fluid Extract of Calamus* (Sweet Flag).—Calamus in No. 50 powder—Alcohol. Make a fluid extract as directed (1069).

1075. Extractum Cannabis Indicæ Fluidum—*Fluid Extract of Indian Cannabis or Indian Hemp*.—Cannabis in No. 20 powder—Alcohol. Make a fluid extract as directed (1069).

1076. Extractum Capsici Fluidum — *Fluid Extract of Capsicum* (*Cayenne Pepper*).— Capsicum in No. 60 powder — Alcohol. Make a fluid extract as directed (1069).

1077. * Extractum Cimicifugæ Fluidum — *Fluid Extract of Cimicifuga* (*Black Cohosh*).— Cimicifuga in No. 50 powder — Alcohol. Make a fluid extract as directed (1069).

The British *Liquid Extract of Cimicifuga* is identical with this.

1078. Extractum Cubebæ Fluidum — *Fluid Extract of Cubeb*.— Cubeb in No. 60 powder — Alcohol. Make a fluid extract as directed (1069).

1079. * Extractum Cypripedii Fluidum — *Fluid Extract of Cypripedium* (*American Valerine, Nerveine*).— Cypripedium in No. 60 powder — Alcohol. Make a fluid extract as directed (1069).

1080. * Extractum Gelsemii Fluidum — *Fluid Extract of Gelsemium* (*Yellow Jasmine*).— Gelsemium in No. 60 powder — Alcohol. Make a fluid extract as directed (1069).

1081. * Extractum Gossypii Radicis Fluidum — *Fluid Extract of Cotton Root*.— Gossypium (Cotton Root Bark) in No. 30 powder, 16 $\frac{3}{4}$ ounces av., Glycerin 4 $\frac{1}{2}$ fl.ounces, Alcohol a sufficient quantity. Percolate first with the mixed Glycerin and Alcohol, then with Alcohol as directed (1069).

1082. Extractum Lupulinæ Fluidum — *Fluid Extract of Lupulin*.— Lupulin — Alcohol. Make a fluid extract as directed (1069).

1083. Extractum Mezerii Fluidum — *Fluid Extract of Mezereum* (*Mezereon*).— Mezereum in No. 30 powder — Alcohol. Make a fluid extract as directed (1069).

1084. Extractum Sabinæ Fluidum — *Fluid Extract of Savin*.— Savin (tops) in No. 40 powder — Alcohol. Make a fluid extract as directed (1069).

1085. Extractum Sanguinariæ Fluidum — *Fluid Extract of Sanguinaria* (*Bloodroot*).— Sanguinaria in No. 50 powder — Alcohol. Make a fluid extract as directed (1069).

1086. Extractum Scillæ Fluidum — *Fluid Extract of Squill*.— Squill in No. 20 powder — Alcohol. Make a fluid extract as directed (1069).

1087. * Extractum Veratri Viridis Fluidum — *Fluid Extract of Veratrum Viride* (*American Hellebore*).— Veratrum Viride in No. 60 powder — Alcohol. Make a fluid extract as directed (1069).

1088. Extractum Xanthoxyli Fluidum — *Fluid Extract of Xanthoxylum* (*Prickly Ash*).— Xanthoxylum (Prickly Ash) in No. 40 powder — Alcohol. Make a fluid extract as directed (1069).

1089. Extractum Zingiberis Fluidum — *Fluid Extract of Ginger*.— Ginger in No. 40 powder — Alcohol. Make a fluid extract as directed (1069).

Unofficial Fluid Extracts.

The following are unofficial Fluid Extracts which require *Alcohol* as a menstruum for preparing them, and are made in the same manner as directed (1069):

UNOFFICIAL FLUID EXTRACTS CLASS A.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1090	<i>Actæa alba</i>	White Cohosh.....	Root.....	60
1091	<i>Actæa rubra</i>	Baneberry, red.....	Root.....	60
1092	<i>Agaricus albus</i>	White Agaric.....	Fungus.....	40
1093	<i>Akasga</i>	Boundon, Ikaju, Quai..	Root.....	60
1094	<i>Alkanna</i> (<i>Anchusa</i>).....	Alkanet.....	Root.....	50
1095	<i>Alstonia constricta</i>	Australian Bitter Bark..	Bark.....	60
1096	<i>Alstonia scholaris</i>	Dita Bark.....	Bark.....	60
1097	<i>Angelica officinalis</i>	Angelica.....	Root.....	60
1098	<i>Apium graveolens</i>	Celery.....	Seed.....	60
1099	<i>Asarum Canadense</i>	Canada Snakeroot.....	Root.....	60
1100	<i>Asclepias cornuti</i>	Silkweed.....	Root.....	60
1101	<i>Asclepias incarnata</i>	White Indian Hemp....	Root.....	60
1102	* <i>Asclepias tuberosa</i>	Pleurisy, or White Root.	Root.....	60
1103	<i>Aspidium</i> (<i>Filix Mas</i>).....	Male Fern.....	Root.....	60
1104	<i>Avena Sativa</i>	Common Oats.....	Seed.....	40
1105	<i>Azederach</i> (<i>melia A.</i>).....	Pride of India or China..	Root bark..	60
1106	* <i>Baptisia tinctoria</i>	Wild Indigo.....	Root.....	60
1107	<i>Boldus</i> (<i>Peumus B.</i>).....	Boldo.....	Leaves.....	50
1108	<i>Boletus Laricis</i>	Agaric.....	Fungus.....	40
1109	<i>Bryonia alba</i>	Bryony, White ..	Root.....	60
1110	<i>Canella alba</i>	Canella.....	Bark.....	60
1111	* <i>Cannabis sativa</i>	American Hemp.....	Plant.....	50
1112	<i>Cantharis vesicatoria</i>	Cantharides.....	Whole fly..	60
1113	<i>Capsella, B'a-pastoris</i>	Shepherd's Purse.....	Herb.....	50
1114	<i>Cardamomum</i>	Cardamom.....	Seed.....	60
1115	<i>Carophyllus</i>	Cloves.....	Flower buds	60
1116	* <i>Cereus</i>	Cactus.....	Plant.....	50
1117	<i>Chenopodium</i>	Wormseed.....	Seed.....	60
1118	<i>Cinnamomum</i>	Cassia or Cinnamon....	Bark.....	60
1119	<i>Cocculus Indicus</i>	Fish Berries.....	Fruit.....	60
1120	<i>Convallaria Majalis</i>	Lily of the Valley.....	Root or flow's	60
1121	<i>Coriandrum</i>	Coriander.....	Fruit.....	60
1122	<i>Curcuma longa</i>	Turmeric.....	Rhizome....	60
1123	<i>Delphinium consolida</i>	Larkspur.....	Seed.....	60
1124	<i>Delphinium Staphisagria</i> ..	Stavesacre.....	Seed.....	60
1125	<i>Dioscorea villosa</i>	Wild Yam.....	Rhizome....	60
1126	<i>Dipterix odorata</i>	Tonka, Tonqua, or T. Bean	Seed.....	60
1127	<i>Dita</i> (<i>Alst'a scholaris</i>)....	Dita Bark.....	Bark.....	60
1128	<i>Drosera</i>	Sundew.....	Herb.....	40
1129	<i>Drimys Winteria</i>	Winter's Bark.....	Bark.....	60
1130	<i>Erechtithites hieracif'a</i>	Fireweed.....	Herb.....	40
1131	<i>Erigeron Canadense</i>	Canada Fleabane.....	Herb.....	40
1132	* <i>Eriodictyon</i>	Yerba Santa.....	Leaves.....	50
1133	* <i>Euphorbia corollata</i>	Large Flowering Spurge	Root.....	60

UNOFFICIAL FLUID EXTRACTS CLASS A—Continued.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1134	Filix Mas (Aspid'm).....	Male Fern.....	Root.....	60
1135	Galanga.....	Galangal (Catarrh Root).	Rhizome....	60
1136	Gillenia stipulacea.....	American Ipecac.....	Root.....	60
1137	Gillenia trifoliata.....	Indian Physic.....	Root.....	60
1138	Guaiacum lignum.....	Guaiac.....	Wood.....	50
1139	*Helonias.....	False Unicorn.....	Root.....	60
1140	Hibiscus Abelmos's.....	Amber or Ambrette....	Seeds.....	50
1141	Humulus.....	Hops.....	Flowers....	50
1142	Hyoscyami semen.....	Henbane.....	Seed.....	60
1143	Ignatia.....	Ignatia Bean.....	Seed.....	60
1144	Imperatoria.....	Masterwort.....	Rhizome....	60
1145	Iris Florentina.....	Orris Root.....	Rhizome....	60
1146	Jalapa (Ipomea J'a).....	Jalap.....	Tuber.....	60
1147	Kamala (Rottlera).....	Kameela.....	Glands, etc.	60
1148	Kava (Methysticum).....	Ava Kava.....	Root.....	60
1149	Levisticum.....	Lovage.....	Root or seed	60
1150	Lindera.....	Spicewood, Fever Bush.	Berries or b'k	60
1151	Liquidambar.....	Sweet Gum Tree.....	Bark.....	60
1152	Lippia Mexicana.....		Herb.....	50
1153	Liriodendron.....	Tulip Tree, Whitewood.	Bark.....	60
1154	*Lobelia.....	Lobelia, Indian Tobacco	Seed.....	60
1155	Magnolia glauca.....	Magnolia.....	Flowers or b	50
1156	Methysticum.....	Ava Kava, Kava Kava..	Root.....	60
1157	Micrmeria.....	Yerba Buena.....	Plant.....	50
1158	Myrica cerefera.....	Bayberry.....	Bark.....	60
1159	Myristica fragrans.....	Mace or Nutmeg.....	Seed.....	60
1160	Petroselinum.....	Parsley Seed.....	Fruit.....	60
1161	Peumus Boldus.....	Boldo.....	Leaves.....	50
1162	Phelandrium.....	Water Fennel Seed.....	Fruit.....	50
1163	Physostigma.....	Calabar Bean.....	Seed.....	60
1164	Pimenta.....	Allspice.....	Fruit.....	60
1165	Piper Methysticum.....	Ava or Kava Kava.....	Root.....	60
1166	Piper Nigrum.....	Black Pepper.....	Fruit.....	60
1167	Pimpinella saxifraga.....	Pimpernel, Small Saxifrage	Root.....	60
1168	*Populus Candicans.....	Balm or Balsam of Gilead	Leaf buds..	40
1169	Pyrethrum.....	Pellitory.....	Root.....	60
1170	*Rhus Toxicodendron.....	Poison Ivy or Oak.....	Leaves.....	40
1171	Ricinus.....	Castor Oil Bean.....	Seed.....	50
1172	Rottleræ glandulæ.....	(Kamala) Kameela.....	Glands, etc.	60
1173	Sabadilla.....	Cevadilla.....	Seed.....	60
1174	Santalum citrinum.....	White or Yellow Santal.	Wood.....	60
1175	Santalum rubrum.....	Red Saunders.....	Wood.....	60
1176	Santonica.....	Wormseed, unexpanded.	Flowerheads	40
1177	Silphium lacinatum.....	Rosin weed.....	Root.....	60
1178	Staphisagria (Del. S.)....	Stavesacre.....	Seed.....	60
1179	Strychnos Ignatia.....	Ignatia Bean.....	Seed.....	60
1180	Sumbul (Ferula S.).....	Musk root.....	Root.....	60
1181	*Thuja occidentalis.....	Arbor Vitæ, Thuya.....	Twigs.....	30
1182	Trillium pendulum.....	Beth or Birth Root.....	Root.....	60
1183	Turnera aphrodis'ca.....	Damiana.....	Leaves.....	50
1184	Urechites suberecta.....		Leaves.....	50
1185	Veratrum sabadilla.....	Cevadilla.....	Seed.....	60
1186	Wintera (Drimys W.)....	Winter's Bark.....	Bark.....	60
1187	Xanthoxylum.....	Prickly-Ash Berries....	Fruit.....	50
1188	Zedoaria.....	Zedoary.....	Root.....	60

Fluid Extracts Class B.

The following drugs require a menstruum of three measures of Alcohol to one measure of Water for preparing their Fluid Extracts. To complete the formula for any Fluid Extract in this class put the name of the drug and the fineness of powder required in the following

1189. General Formula.

The Drug, in No. powder, . . 16 $\frac{2}{3}$ ounces av.
Alcohol, }
Water, } each, a sufficient quantity.

Mix three measures of Alcohol with 1 measure of Water, and having moistened the drug with from 8 to 10 ounces of the mixture, macerate for 24 hours in a covered vessel in a warm place; transfer to the water-bath percolator, pack firmly, pour upon it sufficient menstruum to saturate and cover the drug and set in a warm place for two days; then heat moderately and after one hour begin to percolate slowly, adding menstruum to the drug and continuing the heat and percolation until 13 ounces have passed, which reserve. Turn off the heat and continue the percolation with the menstruum until the drug is exhausted. Distill the Alcohol ($\frac{3}{4}$ of the measure) from this last portion, evaporate the residue to a soft extract, which dissolve in the reserved portion and add enough of the menstruum to make a pint of the Fluid Extract. The Alcohol remaining in the drug after percolation may be recovered by distillation. If Glycerin is directed it should be added to the first portion of the menstruum used.

The * indicates that Fluid Extracts are also prepared from the fresh or green drug. See Green Plant Fluid Extract.

Many of the drugs that are included in Class A yield their medicinal properties to a menstruum of 3 parts Alcohol to 1 of Water, and might properly be included in this class, but as they have generally been made with Alcohol only as a menstruum we have not thought best to depart from the established custom for the small saving that would be made.

U. S. Official Fluid Extracts.

The following are the U. S. Official Fluid Extracts, requiring a menstruum of 3 parts by weight of Alcohol to 1 of Water. They may, however, be made by the general formula (1189), using 3 measures of Alcohol to 1 of Water.

1190. *Extractum Grindeliæ Fluidum — *Fluid Extract of Grindelia*. — Grindelia in No. 30 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

1191. Extractum Guaranæ Fluidum — *Fluid Extract of Guarana*. — Guarana in No. 50 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

1192. Extractum Hydrastis Fluidum — *Fluid Extract Hydrastis (Golden Seal)*. Hydrastis in No. 50 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

1193. *Extractum Iridis Fluidum — *Fluid Extract of Iris (Blue Flag)*. Iris (Blue Flag Root) in No. 50 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

1194. Extractum Nucis Vomiciæ Fluidum — *Fluid Extract Nux Vomica*. — Nux Vomica in No. 60 powder. — Alcohol 8, Water 1. Make a fluid extract as directed (1189).

The official formula directs a menstruum of 8 parts by weight (9 by measure) of Alcohol to 1 part of Water. This formula is included in this class, but the menstruum as here directed should be used.

1195. Extractum Podophylli Fluidum — *Fluid Extract of Podophyllum (Mandrake)*. — Podophyllum (Mandrake Root) in No. 50 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

1196. Extractum Serpentariæ Fluidum — *Fluid Extract of Serpentaria*. — Serpentaria in No. 50 powder. — Alcohol 3, Water 1. Make a fluid extract as directed (1189).

Fluid Extracts of *Digitalis*, *Hyoscyamus*, *Rhubarb* and *Stramonium*, are directed by the U. S. P. to be made with 3 parts by weight of Alcohol to 1 of Water, but in our opinion their properties are as well obtained by a menstruum of less Alcoholic strength, and we have put them in Class C.

Some of the fluid extracts included in this class might be made with a menstruum of less alcoholic strength, but it is rather difficult to direct the exact proportion of Alcohol which would be necessary to hold the medicinal properties of the drugs, as they are found in the market, in solution; therefore, it is best to have the menstruum contain an excess rather than a deficiency of spirit.

Unofficial Fluid Extracts.

The following are unofficial Fluid Extracts which require 3 measures of Alcohol to 1 measure of Water as a menstruum for preparing them, and are made in the same manner as directed (1189):

UNOFFICIAL FLUID EXTRACTS CLASS B.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1197	<i>Acalypha Virginica</i>	Mercury Weed.....	Herb.....	40
1198	<i>Anemopsis Californica</i>	Yerba Mansa.....	Plant.....	40
1199	* <i>Arum triphyllum</i>	Wild or Indian Turnip..	Cormus ...	50
1200	<i>Asimina triloba</i>	Papaw.....	Seed.....	50
1201	<i>Aspidosperma</i>	Quebracho.....	Bark.....	50
1202	* <i>Baccharis pilularis</i>	Kidney Root.....	Root.....	50
1203	* <i>Calycanthus Floridus</i>	Carolina Allspice.....	Bark.....	50
1204	<i>Cascarilla</i> (<i>Croton Eluteria</i>)	Cascarilla.....	Bark.....	50
1205	<i>Cochlearia armoracia</i>	Horseradish.....	Root.....	50
1206	Coto (add 4 fl. oz. Glycerin)	Coto Bark.....	Bark.....	50
1207	<i>Eremocarpus Setigerus</i> ...	Ginger Leaf.....	Herb.....	40
1208	<i>Erythrophloeum, Casca</i> ...	Sassy or Mancona.....	Bark.....	50
1209	<i>Ephedra Antisyphilitica</i> ..	Ephedra.....	Plant.....	50
1210	<i>Euphorbia Ipecacuanha</i> ...	Ipecacuanha Spurge....	Root.....	50
1211	<i>Euphorbia pilulifera</i>	Pill Bearing Spurge....	Plant.....	40
1212	* <i>Grindelia squarrosa</i>.....	.....	Leaves, tops	40
1213	<i>Juglans cinerea</i>	American Butternut....	Root bark..	50
1214	<i>Menispermum</i>	Yellow Parilla.....	Root.....	50
1215	<i>Mercurialis annua</i>	Mercury Herb.....	Herb.....	40
1216	<i>Nectandra</i>	Bebeeru.....	Bark.....	50
1217	* <i>Polygonum</i>	Smartweed.....	Herb.....	30
1218	* <i>Polymnia uedalia</i>	Bearsfoot, Leafcup.....	Root.....	50
1219	<i>Sassafras officinalis</i>	Sassafras.....	Root bark..	50
1220	* <i>Stramonium</i> (<i>Datura S.</i>)..	Stramonium.....	Leaves.....	40

Fluid Extracts, Class C.

The following drugs require a menstruum of two measures of Alcohol to one measure of Water, for preparing their Fluid Extracts. To complete the formula for any Fluid Extract in this Class, put the name of the drug and the fineness of powder required in the following

1221. General Formula.

The Drug in No. powder, 16 $\frac{2}{3}$ ounces av.
 Alcohol, } each, a sufficient quantity.
 Water, }

Mix two measures of Alcohol with one measure of Water, and having moistened the drug with from 8 to 10 ounces of the mixture, macerate for 24 hours in a covered vessel in a warm place; transfer to the water-bath percolator, pack firmly, pour upon it sufficient menstruum to saturate and cover the drug, and set in a warm place for two days; then heat moderately, and after one hour begin to percolate slowly, adding menstruum to the drug, and continuing the heat and percolation until 13 ounces have passed, which reserve. Turn off the heat and continue the percolation with the menstruum until the drug is exhausted. Distill the Alcohol ($\frac{2}{3}$ of the measure) from this last portion, evaporate the residue to a soft extract, which dissolve in the reserved portion, and add enough of the menstruum to make a pint of the fluid extract. The Alcohol remaining in the drug after percolation may be recovered by distillation. If Glycerin is directed it should be added to the first portion of menstruum used.

The * indicates that fluid extracts are also prepared from the fresh or green drug. See Green Plant Fluid Extract.

U. S. Official Fluid Extracts.

The following U. S. Official Fluid Extracts are directed by the U. S. P. to be made with a menstruum of Alcohol 2 parts by weight to Water 1 part, but they may be made by the general formula (1221), using Alcohol 2 parts by measure to Water 1 part.

1222. Extractum Aurantii Amari Fluidum — *Fluid Extract of Bitter Orange Peel*.— Bitter Orange Peel in No. 20 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1223. Extractum Buchu Fluidum — *Fluid Extract of Buchu*.— Buchu in No. 40 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1224. Extractum Colchici Radicis Fluidum — *Fluid Extract of Colchicum Root*.— Colchicum Root in No. 50 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1225. Extractum Colchici Seminis Fluidum — *Fluid Extract of Colchicum Seed*.— Colchicum Seed in No. 30 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1226. Extractum Digitalis Fluidum — *Fluid Extract of Digitalis (Foxglove).*—Digitalis (recently dried) in No. 50 powder—Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1227. Extractum Hyoscyami Fluidum — *Fluid Extract of Hyoscyamus (Henbane).*—Hyoscyamus in No. 50 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1228. Extractum Matico Fluidum — *Fluid Extract of Matico.*—Matico in No. 40 powder — Alcohol, Water, Glycerin. Mix 14 fl.ounces of Alcohol 3 fl.ounces each Water and Glycerin for first percolation, then finish with Alcohol 2, Water 1, as directed (1221).

1229. Extractum Rhei Fluidum — *Fluid Extract of Rhubarb.*—Rhubarb in No. 30 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1230. Extractum Rubi Fluidum — *Fluid Extract of Rubus (Blackberry).*—Blackberry Root-Bark in No. 50 powder — Alcohol, Glycerin, Water. Mix 8 fl.ounces Alcohol, 5 fl.ounces of Water and $1\frac{1}{4}$ fl.ounces of Glycerin for first percolate, then finish with a menstruum of 26 fl.ounces Alcohol to 16 fl.ounces of Water.

1231. Extractum Senegæ Fluidum — *Fluid Extract of Senega.*—Senega in No. 40 powder — Alcohol 2, Water 1, Water of Ammonia. Make a fluid extract as directed (1221), and when completed add 3 fl.drachms Water of Ammonia to a pint.

1232. Extractum Stramonii Fluidum — *Fluid Extract of Stramonium.*—Stramonium in No. 40 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1233. Extractum Valerianæ Fluidum — *Fluid Extract of Valerian.*—Valerian in No. 50 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

1234. *Extractum Viburni Fluidum — *Fluid Extract of Viburnum.*—Viburnum (Black Haw) in No. 50 powder — Alcohol 2, Water 1. Make a fluid extract as directed (1221).

Fluid Extract of *Digitalis*, *Hyoscyamus*, *Rhubarb* and *Stramonium*, are directed by the U. S. P. to be made with a menstruum of 3 parts Alcohol by weight to 1 part Water, but we have classed them here, as we think the alcoholic strength of the menstruum sufficient.

Many of the fluid extracts included in this class might readily be made with diluted Alcohol instead of 2 parts of Alcohol to 1 part of Water but for the difficulty experienced in percolating with the weaker menstruum, on account of the larger proportion of water softening their mucilaginous constituents, thus making it impossible for the menstruum to pass through them. It is therefore necessary in exhausting them to use a menstruum of sufficient alcoholic strength to prevent this difficulty and allow the percolation to

proceed freely. Some manufacturers first exhaust these drugs with an alcoholic menstruum and then distill off a portion, making up the quantity with water, but this is hardly expedient in making small quantities.

Unofficial Fluid Extracts.

The following are unofficial Fluid Extracts which require 2 measures of Alcohol to 1 measure of Water for preparing them, and are made in the same manner as is directed (1221):

UNOFFICIAL FLUID EXTRACTS CLASS C.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1235	<i>Acacia jurema</i>	Adstringens.....	Bark.....	50
1236	<i>Aconiti folia</i>	Aconite, Monkshood...	Leaves.....	30
1237	<i>Æsculus glabra</i>	Buckeye.....	Bark.....	40
1238	<i>Æsculus Hippocastanum</i> ...	Horse Chestnut.....	Seed.....	40
1239	* <i>Ailanthus</i>	Tree of Heaven.....	Root bark...	40
1240	<i>Adansonia digitata</i>	Baobab.....	Bark.....	40
1241	<i>Alnus rubra</i> (or <i>Serrulata</i>)...	Tag Alder.....	Bark.....	40
1242	<i>Althææ radix</i>	Marsh Mallow.....	Root.....	20
1243	<i>Anemopsis Californica</i> ...	Herba Mansa.....	Root.....	40
1244	<i>Anethum graveolens</i>	Dill Seed.....	Fruit.....	40
1245	<i>Angostura</i> (<i>Galip'cuspora</i>)...	Angustura.....	Bark.....	50
1246	<i>Anisum</i>	Anise Seed.....	Fruit.....	40
1247	<i>Apocynum androsæ'um</i> ...	Bitter Root.....	Root.....	50
1248	<i>Apocynum cannabinum</i> ...	Black Indian Hemp...	Root.....	50
1249	<i>Arnica flores</i>	Arnica Flowers.....	Flowers.....	30
1250	<i>Artemisia frigida</i>	Mountain Sage.....	Plant.....	30
1251	<i>Artemisia vulgaris</i>	Mugwort.....	Root.....	40
1252	<i>Asclepias curassavica</i> ...	Blood Flower.....	Plant.....	30
1253	<i>Belladonnæ folia</i>	Belladonna.....	Leaves.....	30
1254	* <i>Berberis aquifolium</i>	Oregon Grape.....	Root.....	50
1255	<i>Berberis vulgaris</i>	Barberry.....	Bark.....	50
1256	<i>Betonica officinalis</i>	Betony.....	Herb.....	30
1257	<i>Buxus sempervirens</i>	Box.....	Bark or l'v's.	30
1258	<i>Calendula</i>	Marigold.....	Flowers.....	30
1259	<i>Carum carvi</i>	Caraway Seed.....	Fruit.....	50
1260	<i>Carrota</i> (<i>Daucus C.</i>).....	Carrot Seed.....	Fruit.....	50
1261	<i>Catalpa</i> (<i>Bignonia C.</i>)...	Cigar Tree.....	Bark, pods..	50
1262	<i>Caulophyllum</i>	Blue Cohosh.....	Root.....	50
1263	* <i>Cheledonium majus</i>	Garden Celandine.....	Herb.....	40
1264	<i>Chiococca racemosa</i>	Cachinca.....	Root bark...	40
1265	<i>Chrysophyllum</i>	Monesia.....	Bark.....	40
1266	* <i>Collinsonia</i>	Stone Root, Heal All...	Root.....	40
1267	<i>Corallorhiza</i>	Coral Root, Crawley...	Root.....	50
1268	* <i>Corydalis</i> (<i>Dicentra Can.</i>)...	Turkey Corn.....	Tuber.....	50
1269	<i>Corypha cerefera</i>	Carnauba, Wax Palm...	Root.....	50
1270	<i>Cuminum Cyminum</i>	Cummin Seed.....	Fruit.....	50
1271	* <i>Draconitum</i>	Skunk Cabbage.....	Root.....	50
1272	<i>Duboisia Myoporoides</i> ...	Duboisia.....	Leaves.....	30
1273	<i>Equisticum</i>	Horsetail.....	Stems.....	40
1274	* <i>Eryngium aquaticum</i>	Water Eryngo.....	Root.....	50

UNOFFICIAL FLUID EXTRACTS CLASS C — Continued.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1275	<i>Eryngium yuccæfolium</i> ...	Corn Snakeroot.....	Root.....	50
1276	* <i>Euonymus</i>	Wahoo.....	Bark.....	50
1277	<i>Fœniculum</i>	Fennel Seed.....	Fruit.....	50
1278	<i>Francisca uniflora</i>	Manaca.....	Root.....	50
1279	<i>Garrya Fremontii</i>	Quinine Bush.....	Herb.....	40
1280	<i>Hedeoma</i>	Pennyroyal.....	Leaves.....	30
1281	<i>Helianthus</i>	Sunflower.....	Seed.....	30
1282	<i>Helleborus niger</i>	Black Hellebore.....	Root.....	50
1283	<i>Hyoscyami radix</i>	Henbane.....	Root.....	50
1284	<i>Illicium Anisatum</i>	Star Anise Seed.....	Fruit.....	50
1285	<i>Inula Helenium</i>	Elecampane.....	Root.....	50
1286	<i>Laurus nobilis</i>	Bay Laurel, Bay Tree..	Leaves.....	30
1287	<i>Ledum palustre</i>	Labrador Tea.....	Twigs, Tops	40
1288	<i>Manzanita</i> (<i>Arctostaphylos</i>)	Glauc.....	Leaves.....	30
1289	<i>Matricaria</i>	German Chamomile....	Flowers....	20
1290	<i>Monarda fistulosa</i>	Wild Bergamont.....	Herb.....	30
1291	<i>Monarda punctata</i>	Horsemint.....	Herb.....	30
1292	<i>Monotropa uniflora</i>	Fit Root, Ice Plant....	Plant.....	50
1293	<i>Myrtus Checan</i>	Cheken, Chequin.....	Leaves.....	40
1294	<i>Nuphar advena</i>	Yellow Pond Lily.....	Root.....	40
1295	<i>Nymphaea odorata</i>	White Pond Lily.....	Root.....	40
1296	<i>Onosmodium Virginianum</i>	False Gromwell.....	Seeds, root..	40
1297	<i>Organum</i>	Wild Majoram.....	Herb.....	30
1298	<i>Pæonia officinalis</i>	Peony.....	Root.....	50
1299	* <i>Penthorium sedoides</i>	Virginia Stone Crop....	Herb.....	30
1300	* <i>Phytolacca</i>	Garget or Poke.....	Root.....	50
1301	<i>Phellandrium aquaticum</i> ..	Water Fennel.....	Seed.....	40
1302	<i>Piscidia</i>	Jamaica Dogwood.....	Root bark...	50
1303	<i>Polemonium reptans</i>	Abscess Root.....	Root.....	50
1304	<i>Polygonatum giganteum</i> ..	Soloman's Seal.....	Root.....	30
1305	<i>Potentilla Canadensis</i>	Cinquefoil, Firefinger..	Plant.....	30
1306	<i>Potentilla Tormentilla</i>	Tormentil.....	Root.....	40
1307	<i>Populus alba</i>	White Poplar.....	Inner bark..	50
1308	<i>Ptelea trifoliata</i>	Waferash, Hoptree....	Inner bark..	50
1309	<i>Pulsatilla</i> (<i>Anemone P.</i>)..	Pulsatilla.....	Herb.....	30
1310	<i>Pycnanthemum</i>	Mountain Mint.....	Herb.....	30
1311	<i>Quillaia</i>	Soap Tree.....	Bark.....	50
1312	* <i>Rhus aromatica</i>	Sweet Sumach.....	Root Bark..	50
1313	<i>Rhododendron maximum</i> ..	Great Laurel.....	Inner bark..	50
1314	<i>Robina</i>	Locust Tree.....	Leaves.....	40
1315	<i>Sabal serrulata</i>	Palmetto Saw Berries..	Fruit.....	40
1316	<i>Salix alba</i>	White Willow.....	Bark.....	40
1317	<i>Salix nigra</i>	Black Willow.....	Bark.....	40
1318	<i>Saponaria</i>	Soapwort.....	Root.....	50
1319	<i>Satureja hortensis</i>	Summer Savory.....	Herb.....	30
1320	<i>Sesamum orientale</i>	Benne.....	Leaves.....	30
1321	<i>Simaba Cedron</i>	Cedron Seed.....	Seed.....	50
1322	<i>Sterculia acuminata</i>	Cola or Kola.....	Nuts.....	50
1323	<i>Symplocarpus</i> (<i>Draconitum</i>)	Skunk Cabbage.....	Root.....	50
1324	<i>Veratrum album</i>	White Hellebore.....	Root.....	50
1325	<i>Xanthium Strumarium</i>	Cocklebur.....	Burrs.....	40
1326	<i>Xanthium spinosum</i>	Spiny Burweed.....	Plant.....	40
1327	<i>Uvularia perfoliata</i>	Bellwort.....	Root.....	40
1328	<i>Viburnum opulus</i>	Cramp, Cranberry.....	Bark.....	40
1329	<i>Zanthorrhiza Apiifolia</i> ..	Yellow Root.....	Root.....	50

Fluid Extracts Class D.

The following drugs require Diluted Alcohol as a menstruum for preparing their fluid extracts; equal measure of Alcohol and water, although it is not the present officinal standard for Diluted Alcohol, will be of sufficient Alcoholic strength for these Fluid Extracts. To complete the formula for any Fluid Extract in this class, put the name of the drug and the fineness of powder required in the following

1330. General Formula.

The Drug in No. powder, . . . 16 $\frac{2}{3}$ ounces av.
Diluted Alcohol, a sufficient quantity.

Moisten the drug with from 8 to 10 ounces of Diluted Alcohol mixed with the Glycerin, if any is directed to be used, and macerate for 24 hours in a covered vessel in a warm place; transfer to the water-bath percolator, pack firmly, pour upon it sufficient Diluted Alcohol to saturate and cover the drug, and set in a warm place for two days, then heat moderately and after one hour begin to percolate slowly, adding Diluted Alcohol to the drug and continuing the heat and percolation until 13 ounces have passed, which reserve. Turn off the heat and continue the percolation with Diluted Alcohol until the drug is exhausted. Distill the Alcohol ($\frac{1}{2}$ the measure) from this last portion, evaporate the residue to a soft extract, which dissolve in the reserved portion and add enough Diluted Alcohol to make a pint of the Fluid Extract. The Alcohol remaining in the drug after percolation may be recovered by distillation.

The * indicates that Fluid Extracts are also prepared from the fresh or green drug. See Green Plant Fluid Extract.

U. S. Official Fluid Extracts.

The following are the U. S. Official Fluid Extracts made with *diluted Alcohol*, in accordance with this formula. When

Glycerin is used it should be added to the diluted Alcohol used to moisten the drug:

1331. Extractum Arnicæ Radicis Fluidum — *Fluid Extract of Arnica Root*.— Arnica Root in No. 50 powder— Diluted Alcohol. Make a fluid extract as directed (1330).

1332. Extractum Calumbæ Fluidum — *Fluid Extract of Calumba (Columbo)*.— Calumba (Columbo), in No. 20 powder— Diluted Alcohol. Make a fluid extract as directed (1330).

1333. Extractum Chimaphilæ Fluidum — *Fluid Extract of Chimaphila (Pipsissewa)*.— Chimaphila (Prince's Pine), in No. 20 powder— Diluted Alcohol— Glycerin ($1\frac{1}{4}$ fl.ounce to a pint.) Make a fluid extract as directed (1330).

1334. Extractum Chiratæ Fluidum — *Fluid Extract of Chirata*.— Chirata in No. 30 powder— Diluted Alcohol— Glycerin ($1\frac{1}{4}$ fl.ounce to a pint). Make a fluid extract as directed (1330).

1335. Extractum Conii Fluidum — *Fluid Extract of Conium (Cicuta Water Hemlock)*.— Conium (Fruit), in No. 40 powder— Diluted Alcohol— Diluted Hydrochloric Acid ($\frac{1}{2}$ fl.ounce to a pint). Make as directed (1330), adding the diluted acid to the portion to be evaporated.

1336. Extractum Cornus Fluidum — *Fluid Extract of Cornus (Dogwood)*.— Cornus (Dogwood Bark), in No. 50 powder— Diluted Alcohol— Glycerin ($2\frac{1}{2}$ fl.ounces to a pint). Make a fluid extract as directed (1330).

1337. Extractum Dulcamaræ Fluidum — *Fluid Extract of Dulcamara (Bittersweet)*.— Dulcamara (Bittersweet), in No. 50 powder— Diluted Alcohol. Make a fluid extract as directed (1330).

1338. Extractum Erythroxylî Fluidum — *Fluid Extract of Erythroxylon (Coca)*.— Erythroxylon (Coca leaves), in No. 40 powder— Diluted Alcohol. Make a fluid extract as directed (1330). The Br. *Liquid Extract of Coca* is similar to this fluid extract.

1339. Extractum Eupatorii Fluidum — *Fluid Extract of Eupatorium Boneset (Thoroughwort)*.— Eupatorium (Boneset), in No. 30 powder— Diluted Alcohol. Make a fluid extract as directed (1330).

1340. Extractum Gentianæ Fluidum — *Fluid Extract of Gentian*.— Gentian in No. 20 powder— Diluted Alcohol. Make a fluid extract as directed (1330).

1341. Extractum Geranii Fluidum — *Fluid Extract of Geranium (Cranesbill)*.— Geranium (Cranesbill Root), in No. 30 powder— Diluted Alcohol— Glycerin ($1\frac{1}{4}$ fl.ounce in a pint). Make a fluid extract as directed (1330).

1342. Extractum Glycyrrhizæ Fluidum — *Fluid Extract of Glycyrrhiza (Licorice)*.— Glycyrrhiza (Licorice Root), in No. 30 powder— Diluted

Alcohol—Water of Ammonia ($1\frac{1}{2}$ fl.ounce in a pint). Mix the Water of Ammonia with the first portions diluted Alcohol used and make a fluid extract as directed (1330).

1343. Extractum Krameriae Fluidum—*Fluid Extract of Krameria (Rhatany)*.—Krameria (Rhatany), in No. 30 powder—Diluted Alcohol—Glycerin ($2\frac{1}{4}$ fl.ounces in a pint). Make a fluid extract as directed (1330).

1344. * Extractum Leptandræ Fluidum—*Fluid Extract of Leptandra (Culver's Root)*.—Leptandra (Black Root) in No. 50 powder—Diluted Alcohol—Glycerin (2 fl.ounces in a pint). Make a fluid extract as directed (1330).

1345. * Extractum Lobeliæ Fluidum—*Fluid Extract of Lobelia*.—Lobelia (herb) in No. 50 powder.—Diluted Alcohol. Make a fluid extract as directed (1330).

1346. Extractum Pareiræ Fluidum—*Fluid Extract of Pareira*.—Pareira in No. 40 powder—Diluted Alcohol—Glycerin ($2\frac{1}{2}$ fl.ounces in a pint.) Make a fluid extract as directed (1330).

1347. Extractum Pilocarpi Fluidum—*Fluid Extract of Pilocarpus (Jaborandi)*.—Pilocarpus (Jaborandi) in No. 30 powder—Diluted Alcohol. Make a fluid extract as directed (1330).

1348. Extractum Quassiæ Fluidum—*Fluid Extract of Quassia*.—Quassia in No. 50 powder—Diluted Alcohol. Make a fluid extract as directed (1330).

1349. Extractum Rhois Glabræ Fluidum—*Fluid Extract of Rhus Glabra (Sumac)*.—Rhus Glabra (Sumac "bobs") in No. 30 powder—Diluted Alcohol—Glycerin ($1\frac{1}{4}$ fl.ounces in a pint). Make a fluid extract as directed (1330).

1350. Extractum Rosæ Fluidum—*Fluid Extract of Rose*.—Red Rose in No. 30 powder—Diluted Alcohol—Glycerin ($1\frac{1}{4}$ fl ounce in a pint). Make a fluid extract as directed (1330).

1351. Extractum Rumicis Fluidum—*Fluid Extract of Rumex (Yellow Dock)*.—Rumex (Yellow Dock) in No. 30 powder—Diluted Alcohol. Make a fluid extract as directed (1330).

1352. Extractum Spigeliæ Fluidum—*Fluid Extract of Spigelia (Pink Root)*.—Spigelia (Pink Root) in No. 50 powder—Diluted Alcohol. Make a fluid extract as directed (1330).

1353. * Extractum Stillingiæ Fluidum—*Fluid Extract of Stillingia (Queensroot)*.—Stillingia in No. 30 powder—Diluted Alcohol. Make a fluid extract as directed (1330).

1354. Extractum Uvæ Ursi Fluidum—*Fluid Extract of Uva Ursi*.—Uva Ursi in No. 30 powder—Diluted Alcohol—Glycerin ($1\frac{1}{4}$ fl.ounce in a pint). Make a fluid extract as directed (1330).

Unofficial Fluid Extracts.

The following are unofficial fluid extracts which require Diluted Alcohol as a menstruum for preparing them, and are made in the same manner as directed (1330). Many of these extracts may be made with a menstruum of less alcoholic strength, but, generally, their soluble properties are better held in solution with Diluted Alcohol than with a weaker menstruum.

UNOFFICIAL FLUID EXTRACTS CLASS D.

No.	LATIN NAME.	COMMON NAME.	Parts Used.	Powder No.
1355	<i>Abies balsamea</i>	Balsam Fir Tree.....	Inner bark..	40
1356	<i>Absinthium</i> (<i>Artemisia</i>)..	Wormwood	Leaves, tops.	30
1357	<i>Acanthus mollis</i>	Acanthus	Leaves	30
1358	<i>Achillea millefolium</i>	Yarrow	Leaves, tops.	30
1359	<i>Adiantum</i>	Maidenhair Fern.....	Plant.....	30
1360	<i>Agrimonia Eupatoria</i>	Agrimony	Whole plant.	30
1361	* <i>Aletris farinosa</i>	Unicorn, Star Grass....	Root	50
1362	<i>Althææ flores</i>	Marshmallow	Flowers.....	20
1363	<i>Ambrosia trifida</i>	Richweed, Ragweed....	Herb.....	30
1364	<i>Ampelopsis</i>	Virginia Creeper.....	Twigs, bark.	30
1365	* <i>Amygdalus Persica</i>	Peach Tree.....	Leaves	30
1366	<i>Anagallis arvensis</i>	Scarlet Pimpernel.....	Herb.....	30
1367	<i>Anemone</i>	Wood Anemone.....	Herb.....	30
1368	<i>Anthemis nobilis</i>	English Chamomile....	Flowers....	30
1369	<i>Andira inermis</i>	Cabbage Tree, Yellow..	Bark	40
1370	<i>Aralia hispada</i>	Dwarf Elder	Root	40
1371	<i>Aralia spinosa</i>	Southern Prickly Ash..	Bark	40
1372	<i>Aralia nudicaulis</i>	Amer. Sarsaparilla....	Root	30
1373	<i>Aralia racemosa</i>	Spikenard	Root	30
1374	<i>Areca catechu</i>	Betel nut.....	Seed	50
1375	<i>Aster punicus</i>	Red Stalked Aster.....	Root	40
1376	<i>Asparagus officinalis</i>	Asparagus	Young shoots	30
1377	<i>Aurantii cortex, dulcis</i>	Sweet Orange Peel....	Fruit rind..	20
1378	<i>Betula Lenta</i>	Black or Cherry Birch..	Bark	40
1379	<i>Bidens bipinnata</i>	Spanish Needles.....	Root	50
1380	<i>Bistorta</i> (<i>Polygonum B.</i>)..	Bistort, Snakeweed....	Rhizome....	50
1381	<i>Borago officinalis</i>	Borage	Herb.....	30
1382	<i>Caffæa</i>	Coffee Berries, green..	Seeds.....	30
1383	<i>Caffæa tosta</i>	Coffee Berries, roasted.	Seeds.....	40
1384	<i>Carduus Benedictus</i>	Blessed Thistle.....	Leaves, tops.	30
1385	<i>Carya alba</i>	White Hickory.....	Inner bark..	50
1386	<i>Carthamus tinctorius</i>	Safflower, Am. Saffron..	Flowers.....	30
1387	<i>Cascara amarga</i>	Honduras Bark.....	Bark	40
1388	<i>Cascara sagrada</i>	Rhamnus Prushiana....	Bark	50
1389	<i>Catania</i> (<i>Nepeta C.</i>).....	Catnip, Catmint.....	Herb.....	30
1390	<i>Cephalanthus</i>	Button Bush.....	Bark	50
1391	<i>Celastrus scandens</i>	Staff Tree.....	Root bark..	50
1392	<i>Cercis Canadensis</i>	Judas Tree.....	Root bark..	50
1393	<i>Cetraria</i>	Iceland Moss.....	Entire plant.	20
1394	<i>Ceanothus Americanus</i>	Jersey Tea, Red Root..	Root	50
1395	<i>Chelone glabra</i>	Balmoney, Snakehead...	Herb.....	20

UNOFFICIAL FLUID EXTRACTS CLASS D — Continued.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1396	Chicorium Intybus.....	Chicory.....	Root.....	20
1397	China (Smilax glabra)...	China Root.....	Rhizome....	40
1398	*Chionanthus Virginica...	Fringe Tree.....	Root bark...	50
1399	Cochleria, fresh.....	Scurvy Grass.....	Bruised herb.	20
1400	Colocynthus.....	Colocynth, Bitter Apple.	Fruit.....	20
1401	Comptonia asplenifolia...	Sweet Fern.....	Herb.....	30
1402	Conii folia.....	Cicuta, Conium.....	Leaves.....	30
1403	Convolvulus panduratus...	Wild Jalap.....	Root.....	40
1404	Coptis teeta.....	East Indian Coptis...	Rhizome....	40
1405	Coptis trifolia.....	Coptis, Gold Thread...	Entire plant.	30
1406	Cornus circinata.....	Green Ozier.....	Bark.....	50
1407	Cornus sericea.....	Swamp Dogwood.....	Bark.....	50
1408	Crocus sativus.....	True Saffron.....	Stigmas....	30
1409	Cucumis citrullus.....	Watermelon Seed.....	Seed.....	30
1410	Cucumis pepo.....	Pumpkin Seed.....	Seed.....	30
1411	Cunderango.....	Conderango.....	Bark.....	40
1412	Cunila Mariana.....	Dittany, American.....	Root.....	40
1413	Cynoglossum.....	Hound's Tongue.....	Herb.....	30
1414	Cyperus articulatus.....	Adroe.....	Root.....	40
1415	Diospyros cortex.....	Persimmon.....	Bark.....	40
1416	Diospyros fructus.....	Persimmon.....	Green fruit..	12
1417	Direa palustris.....	Leatherwood.....	Bark.....	40
1418	Dulcamara (Solanum D.)...	Bittersweet.....	Twigs.....	40
1419	Elephantopus tomentosus...	Elephant's Foot.....	Herb.....	30
1420	Epiphegus (Orobanchae)...	Cancer Root.....	Plant.....	40
1421	Epigæa repens.....	Trailing Arbutus.....	Leaves.....	30
1422	*Epilobium.....	Wickup or Willow.....	Herb.....	30
1423	Erythracea.....	Canchalagua.....	Herb.....	30
1424	Erythraea Centaurium.....	European Centaury.....	Herb.....	30
1425	Eupatorium aromaticum...	White Snakeroot.....	Root.....	40
1426	Eupatorium perfoliatum...	Boneset, Thoroughwort.	Herb.....	30
1427	Eupatorium purpureum...	Queen of the Meadow...	Root.....	50
1428	Euphrasia.....	Eyebright.....	Herb.....	30
1429	Fagus ferruginea.....	American Beech.....	Inner bark..	40
1430	*Frankenia.....	Yerba Rheuma.....	Plant.....	30
1431	Frasera.....	American Columbo.....	Root.....	30
1432	Fraxinus Americana.....	White Ash.....	Bark.....	50
1433	Fraxinus sambucifolia.....	Black Ash.....	Bark.....	50
1434	Fucus vesiculosus.....	Bladder or Sea Wrack...	Plant.....	20
1435	Fumaria officinalis.....	Fumitory.....	Leaves.....	30
1436	Galla.....	Nutgall.....	Excrecenses.	40
1437	Galium aperiine.....	Cleavers.....	Herb.....	30
1438	Galium verum.....	Lady's Bedstraw.....	Herb.....	30
1439	Gaultheria.....	Wintergreen.....	Leaves.....	30
1440	Gentiana quinqueflora....	Five-Flowered Gentian.	Plant.....	30
1441	Geum rivale.....	Water Avens.....	Root.....	40
1442	Geum urbanum.....	European Avens.....	Root.....	40
1443	Gnaphalium.....	Life Everlasting.....	Herb.....	30
1444	Gouania Domingensis....	Chewstick.....	Stems.....	40
1445	Granati fructus cortex....	Pomegranate.....	Fruit rind...	20
1446	Granatum.....	Pomegranate.....	Root bark...	50
1447	Gratiola officinalis.....	Hedge Hyssop.....	Herb.....	30
1448	Guaco (Mikania G.).....	Guaco.....	Leaves.....	30
1449	Hæmatoxylon.....	Logwood.....	Wood.....	40
1450	Hamamelidis cortex.....	Witch Hazel.....	Bark.....	50

UNOFFICIAL FLUID EXTRACTS CLASS D—Continued.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
I451	<i>Helianthemum</i>	Frostwort, Rockrose....	Herb.....	30
I452	<i>Hemidesmus</i>	Indian Sarsaparilla.....	Root.....	40
I453	<i>Hepatica</i>	Liverwort, Kidney Leaf.	Leaves.....	30
I454	<i>Heracleum</i>	Masterwort.....	Leaves, root.	30
I455	<i>Heuchera</i>	Alum Root.....	Root.....	40
I456	<i>Hippocastanum</i>	Horse Chestnut.....	Bark.....	40
I457	<i>Hydrangea arborecens</i> ...	Hydrangea, Seven B'ks.	Root.....	50
I458	<i>Hyssopus</i>	Hysop (Am., European)	Plant.....	30
I459	<i>Hypericum perforatum</i> ...	Johnswort.....	Herb.....	30
I460	<i>Ilex Paraguayensis</i>	Paraguay Tea.....	Leaves.....	30
I461	<i>Jeffersonia diphylla</i>	Twin Leaf.....	Root.....	40
I462	<i>Jacaranda Caroba</i>	Caroba.....	Leaves.....	40
I463	<i>Juglans nigra</i>	Black Walnut.....	Bark.....	40
I464	<i>Juglans regia</i>	European Butternut....	Leaves.....	30
I465	<i>Kalmia latifolia</i>	Mountain Laurel.....	Leaves.....	30
I466	<i>Lactuca virosa</i>	Wild Lettuce.....	Leaves.....	30
I467	<i>Lappæ fructus</i>	Burdock Seed.....	Fruit.....	40
I468	<i>Lappæ radix</i>	Burdock Root.....	Root.....	40
I469	<i>Larix Americana</i>	Tamarack.....	Bark.....	40
I470	<i>Lavendula vera</i>	Lavender.....	Flowers....	30
I471	<i>Leonorus cardiaca</i>	Motherwort.....	Herb.....	30
I472	<i>Limonis cortex</i>	Lemon Peel.....	Fruit rind...	20
I473	<i>Liatris odoratissima</i>	Vanilla Plant.....	Leaves.....	30
I474	<i>Liatris spicata</i>	Button Snakeroot.....	Root.....	50
I475	<i>Liatris squarrosa</i>	Blazing Star.....	Root.....	50
I476	* <i>Lycopus Europæus</i>	Bitter Bugle.....	Herb.....	30
I477	<i>Lycopus Virginicus</i>	Bugle Weed.....	Herb.....	30
I478	<i>Maltum</i>	Barley Malt.....	Malted Seed.	30
I479	<i>Malva sylvestris</i>	Common Mallow.....	Leaves.....	20
I480	<i>Mangifera Indica</i>	Mango.....	Bark rind...	30
I481	<i>Mangostana</i>	Mangosteen.....	Fruit rind...	30
I482	<i>Marjorana (Origanum M.)</i>	Sweet Marjoram.....	Herb.....	30
I483	<i>Marrubium vulgare</i>	Hoarhound.....	Herb.....	30
I484	<i>Marunta cotula</i>	May Weed.....	Herb.....	30
I485	<i>Melissa</i>	Sweet Balm.....	Herb.....	30
I486	<i>Melilotus officinalis</i>	Melilot, Sweet Clover...	Flowers....	30
I487	<i>Mentha piperita</i>	Peppermint.....	Herb.....	30
I488	<i>Mentha viridis</i>	Spearmint.....	Herb.....	30
I489	<i>Menyanthes trifoliata</i> ...	Buck Bean, Bog Bean...	Leaves.....	30
I490	<i>Mikania Guaco</i>	Guaco Leaves.....	Leaves.....	30
I491	<i>Mitchella repens</i>	Partridgeberry.....	Herb.....	30
I492	<i>Morus nigra</i>	Mulberry.....	Root.....	40
I493	<i>Myrica Gale</i>	Sweet Gale.....	Herb.....	30
I494	* <i>Oenothera biennis</i>	Evening Primrose.....	Twigs, leaves	40
I495	<i>Osmarrhiza longistylis</i> ...	Sweet Cicely.....	Root.....	40
I496	<i>Osmunda regalis</i>	Buckhorn Brake.....	Root.....	40
I497	<i>Ostrya Virginica</i>	Ironwood.....	Bark.....	40
I498	<i>Oxydendron arboreum</i> ...	Sourwood.....	Twigs.....	30
I499	<i>Panax (Aralia quiquefolia)</i>	Ginseng.....	Root.....	30
I500	<i>Papaver Sonniferum</i>	Poppy.....	Cap., leaves.	50
I501	<i>Pepo (Cucurbita P.)</i>	Pumpkin.....	Seed.....	20
I502	<i>Persia gratissima</i>	Alligator Pear.....	Seed.....	40
I503	<i>Petroselinum</i>	Parsley.....	Root, seed..	30
I504	<i>Pinus Strobus</i>	White Pine.....	Inner bark..	40
I505	<i>Phoradendron</i>	American Mistletoe...	Plant.....	30

UNOFFICIAL FLUID EXTRACTS CLASS D—Continued.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1506	<i>Plantago major</i>	Common Plantain.....	Plant.....	30
1507	<i>Pinus Canadensis</i>	Hemlock.....	Inner bark..	30
1508	<i>Polygala amara</i>	Bitter Polygala	Plant.....	30
1509	<i>Polypodium vulgare</i>	Polypody.....	Root.....	40
1511	<i>Polytrichum</i>	Hair Cap Moss.....	Plant.....	30
1512	<i>Prinos verticillatus</i>	Black Alder.....	Bark.....	40
1513	<i>Pulmonaria</i>	Lungwort.....	Herb.....	30
1514	<i>Pyrethrum Parthenum</i> ...	Feverfew.....	Herb.....	30
1515	<i>Pyrula rotundifolia</i>	Canker Lettuce.....	Herb.....	30
1516	<i>Pyrus Malus</i>	Apple Tree.....	Root bark..	40
1517	<i>Quercus alba</i>	White Oak.....	Bark.....	40
1518	<i>Rhamnus catharticus</i>	Buckthorn.....	Berries.....	20
1519	<i>Rhamnus Prushiana</i>	Cascara Sag. Chittem..	Bark.....	40
1520	<i>Rhœas (Papaver R.)</i>	Red Poppy.....	Flowers.....	30
1521	<i>Ricini folia</i>	Castor Oil Leaves.....	Leaves.....	30
1522	<i>Rubus strigosus</i>	Red Raspberry.....	Leaves.....	30
1523	<i>Rubia</i>	Madder.....	Root.....	30
1524	<i>Rudbeckia</i>	Thimbleweed.....	Tops.....	30
1525	<i>Ruta graveolens</i>	Rue.....	Leaves.....	30
1526	<i>Sabbatia angularis</i>	Am. or Red Centaury ..	Plant.....	30
1527	<i>Sabbatia Elliottii</i>	Quinine Flower.....	Herb.....	30
1528	<i>Salvia officinalis</i>	Sage.....	Leaves.....	30
1529	<i>Sambucus Canadensis</i> ...	Elder.....	Bark, flowers	30
1530	<i>Sarracenia purpurea</i>	Pitcher Plant.....	Plant.....	30
1531	<i>Scrofularia nodosa</i>	Carpenter's Square.....	Root.....	30
1532	* <i>Senecio gracilis</i>	Life Root.....	Plant.....	30
1533	<i>Simaruba officinalis</i>	Simaruba.....	Bark.....	30
1534	<i>Smilax Sarsaparilla</i>	Bamboo Brier.....	Root.....	30
1535	<i>Solidago odora</i>	Golden Rod.....	Herb.....	30
1536	<i>Spirea tomentosa</i>	Hardhack.....	Herb.....	30
1537	<i>Statice Caroliniana</i>	Marsh Rosemary.....	Root.....	40
1538	<i>Stigmata Maydis</i>	Corn Silk.....	Stigmas.....	20
1539	<i>Symphytum officinale</i>	Comfrey.....	Root.....	30
1540	<i>Tabacum (Nicotiana T.)</i> ..	Tobacco.....	Leaf.....	30
1541	<i>Tanacetum vulgare</i>	Tansy.....	Herb.....	30
1542	<i>Tecoma radicans</i>	Trumpet Creeper.....	Bark.....	40
1543	<i>Thea Chinensis</i>	Tea.....	Leaves.....	30
1544	<i>Theobroma Cacao</i>	Chocolate.....	Seeds.....	40
1545	<i>Thymus Vulgaris</i>	Thyme.....	Herb.....	30
1546	<i>Trifolium partense</i>	Red Clover.....	Flowers.....	30
1547	<i>Triosteum perfoliatum</i> ...	Fever Wort.....	Herb.....	30
1548	<i>Tilia</i>	Linden.....	Flowers.....	30
1549	<i>Tonga</i>	Mixed Fiji Island Barks	Barks.....	50
1550	<i>Tormentilla</i>	Tormentil.....	Rhizome.....	30
1551	<i>Tussilago Farfara</i>	Coltsfoot.....	Leaves.....	40
1552	<i>Ulmus fulva</i>	Slippery Elm.....	Bark.....	30
1553	<i>Umbellaria</i>	California Laurel.....	Leaves.....	30
1554	<i>Urtica dioica</i>	Nettle.....	Root.....	40
1555	<i>Ustilago Maydis</i>	Corn Smut or Ergot...	Fungus.....	50
1556	<i>Verbascum thapsus</i>	Mullein.....	Flowers, l's	30
1557	<i>Verbena hastata</i>	Vervain.....	Herb.....	30
1558	<i>Viburnum dentatum</i>	Arrow Wood.....	Bark.....	40
1559	<i>Viola tricolor</i>	Wild Violet or Pansy..	Plant.....	30
1560	<i>Viscum Album</i>	Mistletoe.....	Plant.....	30
1561	<i>Vaccinium Crassifolium</i> ...	Creeping Huckleberry..	Plant.....	30

Other U. S. Official Fluid Extracts.

The following U. S. Official Fluid Extracts cannot well be included under the foregoing classes as they require a different menstruum or some special manipulation. The essential details only are given here. For full detailed formulas, see FENNER'S WORKING FORMULÆ. They should be made by water-bath percolation in a manner similar to those classed in A, B, C, or D.

1562. Extractum Castaneæ Fluidum—*Fluid Extract of Castanea (Chestnut Leaves)*.—Castanea (Chestnut Leaves) in No. 12 powder $16\frac{2}{3}$ ounces av., Water, Alcohol, each sufficient. Percolate the drug with hot Water till exhausted, evaporate the percolate, by water-bath, to 2 pints, add 5 fl.ounces Alcohol, let stand 24 hours for precipitate to subside, filter through calico, evaporate the filtered liquid to $12\frac{1}{2}$ fl.ounces, and add enough Alcohol to make a pint.

1563. Extractum Cinchonæ Fluidum—*Fluid Extract Cinchona (Calisaya)*.—Yellow Cinchona (Calisaya Bark) in No. 50 powder $16\frac{2}{3}$ ounces av., Glycerin 5 fl.ounces, Alcohol, Water, each sufficient. Mix the Glycerin with $14\frac{1}{2}$ fl.ounces of Alcohol and percolate first with the mixture, then with a menstruum of 3 measures of Alcohol mixed with one measure of Water until the drug is exhausted. Reserve the first 13 fl.ounces. Distill the Alcohol from the remainder of the percolate and evaporate the residue to 3 fl.ounces, which add to the reserved portion.

Liquid Extract of Cinchona—The Br. P. directs an *Aqueous Fluid Extract of Cinchona* to be prepared from Cinchona Bark by the aid of a small quantity of Hydrochloric Acid. This is then to be assayed and the quantity of liquid so regulated that it shall contain 5 per cent. of total Alkaloids.

1564. Extractum Ergotæ Fluidum—*Fluid Extract of Ergot (Spurred or Smut Rye)*.—Ergot recently ground in No. 50 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient, diluted Hydrochloric Acid 1 fl.ounce. Percolate first with 6 fl.ounces Alcohol mixed with 10 fl.ounces of Water, then with Water. Reserve first 13 ounces that pass. Mix the dilute Hydrochloric Acid with the remainder of the percolate, evaporate to 3 ounces, and add to the reserved portion.

The Br. *Liquid Extract of Ergot* is similar to this but contains no acid.

1565. Extractum Frangulæ Fluidum—*Fluid Extract of Frangula (Buckthorn Bark)*.—Frangula (Buckthorn Bark) in No. 40 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient. Percolate first with 6 fl.ounces Alcohol mixed with 8 fl.ounces Water, then with Water until exhausted.

Reserve the first 13 fl.ounces of percolate, evaporate the remainder to 3 fl.ounces, and add.

The Br. *Liquid Extract of Rhamnus Frangula* is similar to this Fluid Extract.

1566. Extractum Hamamelidis Fluidum—*Fluid Extract of Hamamelis (Witch Hazel)*.—Hamamelis (Witch Hazel Leaves) in No. 40 powder 16 $\frac{2}{3}$ ounces av., Alcohol, Water. Percolate first with 6 fl.ounces Alcohol mixed with 12 fl.ounces of Water, then with Water until exhausted. Reserve the first 13 fl.ounces of percolate, evaporate the remainder to 3 fl.ounces, and add.

1567. Extractum Ipecacuanhæ Fluidum—*Fluid Extract of Ipecac.*—Ipecac in No. 60 powder 16 $\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient. Percolate the drug with Alcohol until exhausted, distill off the Alcohol until only 4 fl.ounces remain, mix this with a pint of Water and evaporate by water-bath to 12 fl.ounces, let stand 48 hours, then filter and add Water through the filter until the washings are tasteless, evaporate the filtrate and washings to half a pint, and, when cool, add half a pint of Alcohol, and filter. This process removes all the resinous matter and makes an extract mixable with syrup without cloudiness.

1568. Extractum Lactucarii Fluidum—*Fluid Extract of Lactucarium*.—Lactucarium 16 $\frac{2}{3}$ ounces av. is first macerated and washed with gasoline, then dried and percolated with a menstruum of Alcohol 8 fl.ounces mixed with Water 20 fl.ounces. The first 12 fl.ounces of percolate are reserved and the remainder evaporated to 4 fl.ounces and added. This makes an extract that can be mixed with syrup to make Syrup of Lactucarium.

1569. Extractum Pruni Virginianæ Fluidum—*Fluid Extract of Wild Cherry*.—Wild Cherry in No. 20 powder 16 $\frac{2}{3}$ ounces av., glycerin 2 $\frac{1}{4}$ fl.ounces, diluted Alcohol, Water, each sufficient. Mix the Glycerin with 6 ounces of Water and moisten the drug, macerate 48 hours, pack in percolator and percolate with diluted Alcohol until 13 fl.ounces have passed, which reserve, then with Water until exhausted. Evaporate the last portion to 3 fl.ounces and add to the reserved portion.

1570. Extractum Sarsaparilla Fluidum—*Fluid Extract of Sarsaparilla*.—Sarsaparilla in No. 30 powder 16 $\frac{2}{3}$ ounces av., Glycerin 1 $\frac{1}{4}$ fl.ounce, Alcohol, Water, each sufficient. Mix the Glycerin with 6 fl.ounces Alcohol and 10 fl.ounces of Water and percolate first with this mixture, then with a mixture of 1 measure of Alcohol to 2 measures of Water until the drug is exhausted. Reserve the first 13 fl.ounces and evaporate the remainder to 3 fl.ounces, and add to the reserved portion.

The Br. *Liquid Extract of Sarsaparilla* is similar to this but contains a little sugar.

1571. *Extractum Scutellariæ Fluidum—*Fluid Extract of Scutellaria (Skullcap)*.—Scutellaria (Skullcap) in No. 30 powder 16 $\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient. Mix Alcohol and Water in the proportion of 10

fl.ounces of Alcohol to 16 fl.ounces of Water and percolate the drug with the mixture until exhausted, reserve the first 13 fl.ounces of percolate, distill the Alcohol from the remainder, and evaporate the residue to 3 fl.ounces and add to the reserved portion.

1572. Extractum Sennæ Fluidum—*Fluid Extract of Senna*.—Senna in No. 20 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient. Mix Alcohol and Water in the proportion of 13 fl.ounces Alcohol to 16 fl.ounces of Water, and percolate, reserving the first 13 fl.ounces, distilling the Alcohol from the remainder and evaporating the residue to 3 fl.ounces, which add to the reserved portion.

1573. Extractum Taraxaci Fluidum—*Fluid Extract of Taraxacum (Dandelion)*.—Taraxacum (Dandelion Root) in No. 20 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each sufficient. Mix Alcohol and Water in the proportion of 9 fl.ounces of Alcohol to 12 fl.ounces of Water and percolate with the mixture, reserving the first 14 fl.ounces of percolate and distilling the Alcohol from the remainder, evaporating the residue to 2 fl.ounces, which add to the reserved portion.

The Br. *Liquid Extract of Dandelion* is similar to this Fluid Extract.

Other Unofficial Fluid Extracts Requiring Special Treatment.

The following are unofficial Fluid Extracts requiring special treatment, which cannot well be included in Classes A, B, C and D:

1574. Fluid Extract of Cinchona, Detannated—Mix 6 ounces of freshly precipitated, washed, moist Hydrated Peroxide of Iron (Ferric Hydrate) with a pint of Fluid Extract of Cinchona, and allow to stand for 4 days, shaking frequently; then filter, adding through the filter enough Diluted Alcohol to make the measure a pint. If the filtered extract still shows traces of Tannin when tested with Tincture of Chloride of Iron, add an ounce more of the moist Ferric Hydrate, and proceed as before, until it is detannated.

1575. Fluid Extract Garlic—*Allium Sativum*.—Garlic, crushed, 16 ounces av., Alcohol 10 fl.ounces, Water, a sufficient quantity. Mash the Garlic to a pumice in a mortar, pour the Alcohol upon it and macerate for twenty-four hours in a covered vessel in a warm place; transfer to the water-bath percolator, pack moderately, pour upon it sufficient Water to cover the drug, heat very moderately at once, and after one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until a pint of the fluid extract has passed. Although this fluid extract does not

properly come in this class, it is placed here for want of a more convenient place.

1576. Fluid Extract of Hydrastis, Purified—*Fluid Hydrastis*.—Hydrastis in No. 50 powder $16\frac{2}{3}$ ounces av., Glycerin 5 fl.ounces, Alcohol, Water, each a sufficient quantity. Moisten the powder with 8 ounces of Alcohol, and pack firmly in the water-bath percolator, pour upon it a pint of Alcohol and set in a warm place for two days; then heat very moderately and after one hour begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until it is exhausted. Distill the Alcohol from the percolate until it is reduced to a soft extract. To this add the Glycerin and 6 ounces of Water, and agitate; then filter and add through the filter enough Water to make a pint of the fluid extract. The resinous matter remains on the filter. This makes a preparation similar to "Fluid Hydrastis," containing the valuable principles of the drug which are soluble in an aqueous menstruum, and omitting the objectionable ones that are obtained when Water or Alcohol alone is used as a menstruum.

1577. Fluid Extract Ignatia Bean.—Ignatia Bean in No. 60 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each a sufficient quantity. This Fluid Extract is made with the same menstruum and in precisely the same manner as Fluid Extract of Nux Vomica, which see.

1578. Fluid Extract of Senna, Alcoholized—*Purified Fluid Extract of Senna*.—Senna in No. 20 powder $16\frac{2}{3}$ ounces av., Alcohol, Water, each a sufficient quantity. Pack the Senna moderately in the water-bath percolator, pour upon it enough Alcohol to saturate and cover it and set in a warm place for twenty-four hours; then heat very moderately and after one hour begin to percolate, adding a pint and a half of Alcohol to the drug and continuing the percolation until it will no longer drop. [The object of this proceeding is to remove from the Senna the principles which cause it to "gripe" when taken. The Alcohol which is used may be distilled.] Then pour Water upon the Senna and percolate until exhausted. Reserve the first 12 fl.ounces that pass, evaporate the remainder to 4 fl.ounces and add to the reserved portion to make a pint of the Purified Fluid Extract.

1579. Fluid Extract Vanilla—[One half strength.]—Vanilla 8 ounces av., Alcohol, Water, each a sufficient quantity. Mix three measures of Alcohol with two measures of Water, and having cut the Vanilla in fine pieces and reduced it to a coarse powder by thoroughly beating in a mortar, moisten it with 6 ounces of the menstruum, pack firmly in the water-bath percolator, pour upon it 10 ounces of menstruum and set in a warm place for seven days; then heat moderately and after one hour begin to percolate slowly, adding menstruum to the drug and continuing the heat and percolation until $14\frac{1}{2}$ fl.ounces have passed, which reserve. Continue the percolation with the menstruum until the drug is exhausted, then distill the Alcohol from this last portion, evaporate the residue to a soft extract, add to the reserved portion, and afterward sufficient menstruum to make a pint of the fluid extract. After standing a few days filter through muslin.

It will be observed that this is but half the strength of ordinary fluid extracts. It is thus made because a fluid extract of full strength cannot be obtained without impairing the flavor of the preparation by the heat required to evaporate it.

To make Flavoring Extract of Vanilla from this Fluid Extract, use from 1 to 2 fl.ounces, with enough Alcohol and Water mixed in the proportion of three measures of Alcohol to two of Water to make a pint.

To make Tincture of Vanilla, U. S., 1880, use 3 ounces of this fluid extract with enough Alcohol and Water, mixed as above, to make a pint.

1580. Fluid Extract Wild Cherry, Detannated.— Mix 6 ounces freshly precipitated, washed, moist, Hydrated Peroxide of Iron (Ferric Hydrate) with a pint of Fluid Extract of Wild Cherry and allow to stand for four days, shaking frequently; then filter, adding through the filter enough Diluted Alcohol to make the measure a pint.

If the filtered extract still shows traces of tannin, when tested with Tincture of Chloride of Iron, add an ounce more of the moist Ferric Hydrate and proceed as before until it is detannated.

Compound Fluid Extracts.

Under this heading are included all fluid extracts that are made from two or more powdered drugs combined. As only two of them are official, they are called by their ordinary commercial or trade names as they are known and quoted in the market.

Compound fluid extracts may be conveniently made by mixing the fluid extracts of the drugs which compose them in the same proportion as they are directed to be used in the formulas. The prescribing and use of compound fluid extracts should be discouraged, for the reason that there is no official standard for them, and as made by different manufacturers they represent varying proportions of the drugs composing them, and are therefore indefinite.

The following formulæ contain the essential directions for making the fluid extracts, but detailed formulas are given in full in FENNER'S WORKING FORMULÆ:

1581. Fluid Extract Blackberry Compound.— Blackberry Root 12½ ounces av., Cinnamon 2 ounces av., Nutmeg, Coriander, each 1 ounce av., all in No. 40 powder, Glycerin 2 fl.ounces, Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1582. Fluid Extract Black Cohosh Compound.—Black Cohosh in No. 40 powder, 6 ounces av., Wild Cherry in No. 20 powder 4 ounces av., Liquorice Root in No. 30 powder 4 ounces av., Ipecac, Senega, each, in No. 40 powder, 1 ounce av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1583. Fluid Extract Blue Cohosh Compound.—Blue Cohosh in No. 40 powder 8 $\frac{2}{3}$ ounces av., Cramp Bark in No. 30 powder 3 ounces av., Unicorn Root in No. 40 powder 3 ounces av., Celery Root in No. 40 powder, 2 ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1584. Fluid Extract of Buchu and Juniper with Acetate of Potassium.—Buchu Leaves in No. 40 powder 8 ounces av., Juniper Berries in No. 40 powder 4 ounces av., Acetate of Potassium 5 ounces av., Alcohol 2, Water 1, a sufficient quantity. Make 13 ounces of fluid extract from the Buchu and Juniper and add the Acetate of Potassium.

1585. Fluid Extract Buchu and Pareira Brava.—Buchu Leaves in No. 40 powder, Pareira Brava in No. 50 powder, each 8 ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1586. Fluid Extract Buchu Compound.—Buchu Leaves, Juniper Berries, Cubebs, Uva Ursi, each in No. 50 powder 4 ounces av., Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1069).

1587.—Fluid Extract of Cardamom Compound.—Cardamom, Cinnamon, each 6 $\frac{1}{2}$ ounces av., Caraway 2 ounces av., Cochineal 1 $\frac{1}{2}$ ounce av., all in No. 50 powder, Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1588. Fluid Extract Chinchona Aromatic.—Cinchona Bark 8 $\frac{1}{2}$ ounces av., Cinnamon 3 ounces av., Nutmeg, Bitter Orange, each 2 ounces av., all in No. 50 powder, Glycerin 2 fl.ounces, Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1589. Fluid Extract Cinchona Compound.—Red Cinchona Bark in No. 50 powder 8 $\frac{1}{2}$ ounces av., Bitter Orange Peel in No. 20 powder 6 $\frac{1}{2}$ ounces av., Serpentaria in No. 50 powder 1 $\frac{1}{2}$ ounces av., Glycerin 2 fl.ounces, Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1590. Fluid Extract Colocynth Compound.—Purified Aloes, Colocynth Pulp, each in coarse powder 6 $\frac{1}{2}$ ounces av., Liquorice Root in coarse powder, Resin of Scammony, Cardamom Seed, each in fine powder 1 ounce av., Carbonate of Potassium $\frac{1}{2}$ ounce av., Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1591. Fluid Extract Dandelion and Rhubarb.—Dandelion, Rhubarb, each in No. 20 powder 8 $\frac{1}{3}$ ounces av., Diluted Alcohol, a sufficient quantity. Make a pint of fluid extract as directed (1330).

1592. Fluid Extract Dandelion and Senna.—Dandelion, Senna, each in No. 20 powder $8\frac{1}{3}$ ounces av., Diluted Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1330).

1593. Fluid Extract Dandelion Compound.—Dandelion in No. 20 powder $14\frac{2}{3}$ ounces av., Mandrake in No. 40 powder, Conium Leaves in No. 30 powder, each 1 ounce av., Diluted Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1330).

1594.—Fluid Extract Gentian Compound.—Gentian in No. 20 powder 10 ounces av., Bitter Orange Peel in No. 20 powder 4 ounces av., Cardamom in No. 50 powder $2\frac{2}{3}$ ounces av., Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1595. Fluid Extract of Grindelia Compound.—Grindelia Robusta in No. 30 powder $8\frac{2}{3}$ ounces av., Jaborandi in No. 30 powder 4 ounces av., Cubebs in No. 40 powder, Conium Leaves in No. 30 powder, each 2 ounces av., Alcohol, a sufficient quantity. Make a pint of fluid extract as directed (1069).

1596. Fluid Extract Helonias Compound.—Helonias in No. 40 powder 9 ounces av., Buchu, Gentian, Golden Seal, each in No. 30 powder $2\frac{1}{2}$ ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1597. Fluid Extract Hoarhound Compound.—Hoarhound in No. 20 powder, Red Root, Elecampane, Spikenard, Comfrey, Wild Cherry, Bloodroot, each in No. 30 powder $2\frac{1}{3}$ ounces av., Alcohol 3, Water 2, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1598. Fluid Extract Ipecac and Senega.—Ipecac, Senega, each in No. 50 powder $8\frac{1}{3}$ ounces av., Diluted Alcohol, a sufficient quantity. Make a pint of fluid extract as directed (1330).

1599. Fluid Extract Jalap and Rhubarb.—Jalap in No. 40 powder, Rhubarb in No. 20 powder each $8\frac{1}{3}$ ounce av., Carbonate of Potassium $\frac{1}{2}$ ounce av., Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1189).

1600. Fluid Extract Jalap and Senna.—Jalap in No. 40 powder, Senna in No. 30 powder, each $8\frac{1}{3}$ ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1601. Fluid Extract of Liquorice Compound—*For Quinine Mixtures.*—Liquorice Root 7 ounces av., Wild Cherry 6 ounces av., Anise, Coriander, Caraway, each 1 ounce av., all in No. 30 powder, Alcohol 3 fl.ounces, Water, sufficient to make 13 fl.ounces of aqueous fluid extract, and add the Alcohol.

1602. Fluid Extract Lobelia Compound.—Lobelia Herb in No. 30 powder, Bloodroot, Skunk Cabbage in No. 40 powder, each $5\frac{1}{2}$ ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1603. Fluid Extract of Mandrake Compound.—Mandrake in No. 50 powder, Leptandra in No. 40 powder, Senna in No. 30 powder, each 5 ounces av., Canella in No. 40 powder $1\frac{2}{3}$ ounce av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1604. Fluid Extract of Matico Compound.—Matico, Buchu, Cubeb, each in No. 40 powder, $5\frac{1}{2}$ ounces av., Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1069).

1605. Fluid Extract Mitchella Compound.—Mitchella (Squaw Vine) $9\frac{1}{2}$ ounces av., Helonias Root, Blue Cohosh, each $2\frac{1}{2}$ ounces av., Cramp Bark 2 ounces av., all in No. 40 powder, Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1606. Fluid Extract Pink Root and Senna.—Pink Root in No. 40 powder $9\frac{1}{3}$ ounces av., Senna in No. 30 powder $5\frac{1}{3}$ ounces av., Caraway, Anise, each in No. 50 powder 1 ounce av., Diluted Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1330).

1607. Fluid Extract Poke Root Compound.—Poke Root (Phytolacca), Black Cohosh (Cimicifuga), each in No. 40 powder, $6\frac{3}{4}$ ounces av., Prickly-Ash Berries, Juniper Berries, each in No. 30 powder 2 ounces av., Alcohol, a sufficient quantity. Make a pint of fluid extract as directed (1069).

1608. Fluid Extract of Rhubarb and Senna.—Rhubarb in No. 20 powder 10 ounces av., Senna in No. 20 powder 3 ounces av., Coriander, Fennel and Liquorice, each in No. 50 powder, $1\frac{1}{4}$ ounce av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1609. Fluid Extract of Rhubarb, Aromatic.—Rhubarb in No. 20 powder $10\frac{1}{2}$ ounces av., Cloves, Cinnamon, each in No. 50 powder 2 ounces av., Nutmeg in No. 50 powder 1 ounce av., Carbonate of Potassium $\frac{1}{2}$ ounce av., Alcohol 3, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1069).

1610. Fluid Extract of Rumex Compound.—*Compound Fluid Extract of Yellow Dock.*—Yellow Dock Root in No. 20 powder $8\frac{1}{3}$ ounces av., False Bitter-Sweet Bark in No. 30 powder $4\frac{1}{3}$ ounces av., American Ivy Bark, Figwort, each in No. 30 powder 2 ounces av., Diluted Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1330).

1611. Fluid Extract Sarsaparilla and Dandelion.—Sarsaparilla, Dandelion, each in No. 30 powder, $8\frac{1}{3}$ ounces av., Diluted Alcohol a sufficient quantity. Make a pint of fluid extract as directed (1330).

1612. Extractum Sarsaparillæ Compositum Fluidum, U. S.—*Compound Fluid Extract of Sarsaparilla.*—Sarsaparilla in No. 30 powder $12\frac{1}{2}$ ounces av., Liquorice Root in No. 30 powder 2 ounces av., Sassafras Bark in No. 30 powder $1\frac{3}{4}$ ounces av., Mezereum in No. 30 powder $\frac{1}{2}$ ounce av., Glycerin $1\frac{1}{4}$ fl.ounce, Alcohol, Water, each a sufficient quantity. Mix the Glycerin with 6 fl.ounces of Alcohol and 10 fl.ounces of Water, and having moistened the mixed powders with 8 ounces of the mixture, macerate for 24

hours in a close vessel; transfer to the water-bath percolator, pack firmly, pour upon them the remainder of the mixture and set in a warm place for two days; then heat very moderately and after one hour begin to percolate slowly, adding to the drugs, after the liquid has ceased to drop, Alcohol and Water mixed in the proportion of one part of Alcohol to two parts of Water, and continuing the heat and percolation until the drugs are exhausted. Reserve the first 13 fl.ounces that pass, evaporate the remainder to a soft extract, which dissolve in the reserved portion, and add enough of the menstruum last used to make a pint of the fluid extract. Lastly, after standing a few days filter through muslin.

1613. Fluid Extract Skullcap Compound.—Skullcap in No. 20 powder 6¾ ounces av., Cypridium in No. 40 powder 4 ounces av., Hops, Wild Lettuce, each in No. 20 powder 3 ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1614. Fluid Extract Senna Compound.—Senna in No. 30 powder 8¾ ounces av., Rhubarb in No. 20 powder 4 ounces av., Jalap, Mandrake, each in No. 50 powder 2 ounces av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of fluid extract as directed (1221).

1615. Fluid Extract Spikenard Compound—*Compound Fluid Extract of Aralia.*—Spikenard Root, Yellow Dock Root, Burdock Root, Guaiac Wood, Sassafras Bark, each in No. 20 powder 2½ ounces av., Southern Prickly-Ash, Elder Flowers, Blue Flag Root, each in No. 30 powder 2 ounces av., diluted Alcohol a sufficient quantity. Make a pint of Fluid Extract as directed (1330).

1616. Fluid Extract Squill, or Scilla Compound.—Squill in No. 20 powder, Senega in No. 40 powder, each 8½ ounces av., Water of Ammonia ½ fl.ounce, Alcohol 2, Water 1, a sufficient quantity. Make a pint of Fluid Extract as directed (1221), and add the Water of Ammonia.

1617. Fluid Extract Stillingia Compound.—Stillingia, Turkey Corn, each 4 ounces av., Elder Flowers, Blue Flag, Pipsissewa, each 2 ounces av., Coriander Seed, Prickly-Ash Bark, each 1 ounce av., all in No. 30 powder, Alcohol 2, Water 1, a sufficient quantity. Make a pint of Fluid Extract as directed (1221).

1618. Fluid Extract Wild Cherry Compound.—Wild Cherry in No. 20 powder 8¾ ounces av., Hoarhound, Wild Lettuce, each in No. 20 powder 3 ounces av., American Hellebore, Bloodroot, each in No. 40 powder 1 ounce av., Alcohol 2, Water 1, a sufficient quantity. Make a pint of Fluid Extract as directed (1221).

Other Compound Fluid Extracts.—The foregoing formulae for Compound Fluid Extracts represent nearly all that are at present quoted by manufacturers, but other combinations will, no doubt, be added, and it is only necessary for the intelligent druggist to follow the data here given to prepare any Compound Fluid Extract that may be desired.

Green Plant Fluid Extracts.

Fluid Extracts prepared from recently gathered herbs, barks, flowers, roots, etc., have been extensively advertised by manufacturing houses, and some of them are deservedly popular with physicians. Although they cannot have the same uniformity of strength as Fluid Extracts prepared from dry drugs, yet many of them are stronger and better, especially such as depend for their medicinal value upon volatile principles, which would be lost by the process of drying. As there is no standard of strength established for green plant Fluid Extracts except that the liquid shall be saturated with the medicinal properties of the drug, the following general formula, which is adapted for making all of them, is given. These Fluid Extracts are called by some manufacturers concentrated or specific tinctures:

1619. General Formula for Green Plant Fluid Extracts.

The fresh drug, cut, bruised, crushed, dessicated, or otherwise reduced to proper fineness for macerating and percolating, a convenient quantity, Alcohol a sufficient quantity. Having reduced the drug to the proper fineness, pack it in the water-bath percolator, pour sufficient Alcohol upon it to saturate and cover it, and set in a warm place for 2 days; then heat very moderately, and after one hour begin to percolate slowly, and continue until the liquid ceases to drop. Reserve this portion and continue the percolation with Alcohol until the drug is exhausted. Distill the Alcohol from this last portion until the residue is reduced to the consistence of thin syrup, which add to the reserved portion to complete the fluid extract. The Alcohol remaining in the drug after percolation may be recovered by distillation. The following are the drugs from which Green Plant Fluid Extracts are usually prepared. The * denotes that the drug should be macerated as soon as gathered, the † denotes that it should be partly

dried before macerating, and the ‡ denotes that the recently gathered drug should be dried or nearly dried before making up. Herbs should be gathered when in flower, roots and barks in the autumn or early spring:

No.	LATIN NAME.	COMMON NAME.	PART USED.
1620	<i>Ailanthus Glandulosa</i>	Chinese Sumac.....	Root bark, crushed. †
1621	<i>Aletris Farinosa</i>	Star Grass, Unicorn ...	Root, crushed. †
1622	<i>Amygdalus Persica</i>	Common Peach.....	Leaves, bruised. *
1623	<i>Arum Triphyllum</i>	Indian or Wild Turnip.	Cormus, mashed.*
1624	<i>Asclepias Tuberosa</i>	Pleurisy or White Root.	Root, crushed. †
1625	<i>Baptisia Tinctoria</i>	Wild Indigo.....	Root, crushed. †
1626	<i>Berberis Aquifolium</i>	Oregon Grape.....	Root, crushed. †
1627	<i>Cimicifuga Racemosa</i>	Black Cohosh.....	Root, crushed. †
1628	<i>Cactus Grandiflora</i>	Fresh Plant, or.....	Fresh flowers, bruised.*
1629	<i>Cannabis Sativa</i>	American Hemp.....	Plant, bruised. *
1630	<i>Cereus Bonplandi</i>	Cactus.....	Plant, mashed. *
1631	<i>Chelidonium Majus</i>	Garden Celandine.....	Leaves, bruised. *
1632	<i>Chionanthus Virginicus</i> ..	Fringe Tree.....	Bark, crushed. †
1633	<i>Collinsonia Canadensis</i> ..	Stone Root, Ox Balm..	Root, crushed. †
1634	<i>Corydalis Formosa</i>	Turkey Corn or Pea...	Root, crushed. †
1635	<i>Cypripedium Pubescens</i> ..	Lady's Slipper.....	Root, cut and crushed. †
1636	<i>Datura Stramonium</i>	Stramonium.....	Leaves, bruised. *
1637	<i>Epilobium Paulustre</i>	Wickup.....	Herb, bruised. *
1638	<i>Eridiction Glutinosa</i>	Yerba Santa.....	Leaves, bruised. *
1639	<i>Eryngium Aquaticum</i>	Water Eryngo.....	Root, crushed. *
1640	<i>Euonymus Atropurpureus</i>	Wahoo.....	Bark, crushed. †
1641	<i>Euphorbia Hipericifolia</i> ..	Large Spotted Spurge..	Leaves, bruised. *
1642	<i>Frankenia Grandifolia</i> ...	Yerba Rheuma.....	Plant, cut.
1643	<i>Gelsemium Sempervirens</i> .	Yellow Jasmine.....	Root, crushed. †
1644	<i>Gossypium</i>	Cotton Root.....	Bark, crushed. †
1645	<i>Grindelia Robusta</i>.....	.....	Herb, bruised. *
1646	<i>Grindelia Squarrosa</i>.....	.....	Herb, bruised. *
1647	<i>Helonias Diocia</i>	False Unicorn.....	Root, crushed. †
1648	<i>Iris Versicolor</i>	Blue Flag.....	Root, crushed. †
1649	<i>Juglans Cineria</i>	Butternut.....	Root bark, crushed. †
1650	<i>Leptandra Virginica</i>	Culver's or Black Root.	Root, crushed. †
1651	<i>Lobelia Inflata</i>	Lobelia.....	Herb, bruised. *
1652	<i>Lycopus Virginicus</i>	Bugleweed.....	Herb, bruised. *
1653	<i>Macrotya Racemosa</i>	Black Cohosh.....	Root, crushed. †
1654	<i>Nothofragria Biennis</i>	Evening Primrose.....	Plant, bruised. *
1655	<i>Penthorum Sedoides</i>	Virginia Stone Crop...	Herb, bruised. *
1656	<i>Phytolacca Decandra</i>	Poke, Skoke or Garget.	Root, crushed. †
1657	<i>Polygonum Punctatum</i>	Water Pepper.....	Herb, bruised. †
1658	<i>Polymnia Uvedelia</i>	Bearsfoot, Leaf Cup...	Root, bruised. *
1659	<i>Populus Candicans</i>	Balm or Balsam Gilead.	Buds, bruised. *
1660	<i>Ptelia Trifoliata</i>	Wafer Ash.....	Bark, crushed. †
1661	<i>Rhus Toxicodendron</i>	Poison Oak or Ivy.....	Leaves, bruised. †
1662	<i>Rhus Aromatica</i>	Aromatic Sumach.....	Root bark, crushed. *
1663	<i>Scutellaria Laterifolia</i>	Skullcap.....	Herb, bruised. *
1664	<i>Senecio Aureus</i>	Liferoot, Lifewort.....	Herb, bruised. *
1665	<i>Stillingia Sylvatica</i>	Stillingia, Queen's Root	Root, crushed. †
1666	<i>Symplocarpus Fœtidus</i>	Skunk Cabbage.....	Root, crushed. †
1667	<i>Thuja Occidentalis</i>	Arbor Vite.....	Leaves, bruised. *
1668	<i>Veratrum Viride</i>	American Hellebore...	Root, crushed. *
1669	<i>Viburnum Prunifolium</i>	Black Haw.....	Root bark, crushed. †

Acetic Fluid Extracts.

A few Fluid Extracts made with Acetic Acid, instead of an Alcoholic menstruum, have some merit and reputation ; as they are all made by the same general formula and with the same menstruum it is unnecessary to repeat the formula for each.

1670. General Formula for Acetic Fluid Extracts.

To complete the formula for any Acetic Fluid Extract, substitute the name of the drug and the required fineness of powder in the following general formula :

The Drug in No. powder, . . . 16 $\frac{2}{3}$ ounces av.
 Acetic Acid, 16 fl.ounces.
 Water, a sufficient quantity.

Moisten the powder with the Acetic Acid, and macerate in a closed earthenware, or glass vessel, for twenty-four hours ; transfer it to the water-bath percolator, pack moderately, pour upon it a pint of water, and heat at once ; after one hour begin to percolate adding water to the drug and continuing the heat and percolation until 14 fl.ounces have passed, which reserve. Turn off the heat and continue the percolation with Water until the drug is exhausted. Evaporate the last portion to two fl.ounces and add to the reserved portion to make a pint of the Fluid Extract. After standing a few days filter through muslin.

The following drugs are those from which Acetic Fluid Extracts are usually prepared. They may be made from any other drugs which yield their virtues to Acetic Acid.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1671	Digitalis.....	Foxglove.....	Leaves.....	40
1672	Ergota.....	Ergot.....	Fungus.....	50
1673	Lobelia.....	Indian Tobacco.....	Herb.....	40
1674	Sanguinaria.....	Bloodroot.....	Root.....	50
1675	Scilla.....	Squill.....	Bulb.....	20

To make the 1870 Vinegars of these Fluid Extracts mix two fl.ounces with 14 fl.ounces of water.

To make the 1880 Vinegars, mix $1\frac{2}{3}$ fl.ounces of these Extracts with enough water to make a pint.

To make Syrup of Squill, mix 1 fl.ounce of the Acetic Fluid Extract of Squill with 15 fl.ounces of Syrup.

Aqueous Fluid Extracts.

In this class of Fluid Extracts are included all those in which water is mainly employed for extracting their medicinal virtues, and in which Alcohol would be objectionable, either as a menstruum, or for the uses required. In some, however, Alcohol is added as a preservative.

But few Aqueous Fluid Extracts are used, but it is evident that a larger variety might be employed with advantage by the profession. Any drug which yields its medicinal value to water may very properly be exhibited in an Aqueous Fluid Extract, and the formulæ which follow will be sufficiently explicit for making any preparation of this kind that may be desired.

Several Aqueous Fluid Extracts are given in the Br. P. under the name of Liquid Extracts.

1676. Fluid Extract Bael Fruit — *Bela Fructus, Bengal Quince, Ægle Marmelos, Indian Bael.* — Bael Fruit, cut in pieces, 16 ounces av., Water, 12 pints, Alcohol, 3 fl.ounces. Put the Bael Fruit loosely in the water-bath percolator, pour upon it 4 pints of Water and macerate in a warm place for 12 hours, then draw off the liquid by the stop-cock and reserve. Pour on the drug again 4 pints of Water, macerate for two hours and draw off as before. Mix the liquids, evaporate them by gentle heat to 14 fl.ounces, and after straining add 3 fl.ounces of Alcohol to preserve the extract and complete the measure. This is an astringent aromatic demulcent, officinal in the British Pharmacopœia under the name Liquid Extract of Bael, but little used in this country.

1677. Fluid Extract of Broom Tops, Aqueous — *Sarothamnus Scoparius.* — Broom Tops, in No. 20 powder, $16\frac{2}{3}$ ounces av., Glycerin, 5 fl.ounces, Water, a sufficient quantity. Moisten the drug with 10 ounces of Water and macerate for 24 hours in a warm place; then pack moderately in the water-bath percolator, pour upon it a pint of Water, heat moderately, and after

one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate to 10 fl.ounces, filter and add through the filter enough Water to make 11 fl.ounces, then add the Glycerin to make a pint of the fluid extract.

1678. Fluid Extract Cascara Sagrada, Aqueous — *Rhamnus Pru-shina*.— Cascara Sagrada Bark in No. 30 powder 16 $\frac{3}{4}$ ounces av., Glycerin 5 fl.ounces, Water, a sufficient quantity. Mix the Glycerin with a pint of Water and having moistened the powder with 10 ounces of the mixture, macerate for 24 hours in a warm place; then pack moderately in the water-bath percolator, pour upon it the remainder of the mixture, heat moderately, and after one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate, by means of a water-bath to a pint, and after standing a few days filter through muslin. The Br. P. directs *Liquid Extract of Cascara Sagrada* to be made by boiling 1 pound av. of the bark in successive quantities of Water till exhausted, then evaporating the strained liquors to 12 ounces and adding 4 ounces Alcohol. A fluid extract of Cascara Sagrada is also made with Diluted Alcohol as a menstruum, but the Aqueous Extract seems to contain all the valuable medicinal properties of the drug.

1679. Fluid Extract Golden Seal, Aqueous — *Hydrastis without Alcohol. Fluid Hydrastis*.— Golden Seal (*Hydrastis*) in No. 30 powder, 16 $\frac{3}{4}$ ounces av., Glycerin 6 fl.ounces, Water, a sufficient quantity. Mix the Glycerin with 10 ounces of Water, moisten the powder with 8 ounces of the mixture, and macerate for 24 hours in a warm place; transfer to the water-bath percolator, pack moderately, pour the remainder of the liquid upon it and set in a warm place for two days, then heat moderately and after one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until 13 fl.ounces have passed, which reserve. Turn off the heat and continue the percolation with Water until the drug is exhausted. Evaporate this last portion to 3 fl.ounces, which add to the reserved portion to make a pint of the fluid extract, and after standing a few days filter through muslin.

1680. Fluid Extract Ipecac, Aqueous.— Ipecac in No. 30 powder 16 $\frac{3}{4}$ ounces av., Glycerin 6 fl.ounces, Water, a sufficient quantity. Moisten the powder with 12 ounces of Water and macerate for 24 hours, then pack moderately in the water-bath percolator, pour upon it a pint of Water and heat moderately at once. After one hour begin to percolate slowly, adding Water to the drug, and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate to 10 fl.ounces, filter, and add enough Water through the filter to make 10 fl.ounces; then add the Glycerin to make a pint of the fluid extract. This formula makes a preparation which is essentially the same as the officinal fluid extract; but it is much easier and less complicated to prepare. To make Syrup of Ipecac, mix 1 fl.ounce of this extract with 15 fl.ounces of Syrup.

1681. Fluid Extract Liquorice, Aqueous—For Quinine Mixtures, etc.

—Liquorice Root in No. 20 powder $16\frac{2}{3}$ ounces av., Glycerin 5 fl.ounces, Water of Ammonia 3 fl.ounces, Water, a sufficient quantity. Mix the Water of Ammonia with 8 ounces of Water, moisten the drug with the mixture and set in a warm place for one day, then pack moderately in the water-bath percolator, pour upon it a pint of Water, heat at once, and after one hour begin to percolate slowly, adding Water and continuing the heat and percolation until the drug is exhausted. Reserve the first $\frac{1}{2}$ pint that passes, evaporate the remainder to 3 fl.ounces; mix it with the reserved portion, and add the Glycerin to make a pint of fluid extract. After standing a few days filter through muslin. This is an excellent adjuvant for quinine and other bitter medicines. *Liquid Extract of Liquorice* of the Br. P. is made by exhausting 1 pound av. of Liquorice Root with Water by successive maceration and pressures, straining the liquors, evaporating to a sp. gr. of 1.160 when cold, and adding $\frac{1}{6}$ of its volume of rectified spirit.

To make Elixir of Liquorice for quinine mixtures, mix two fl.ounces of this Fluid Extract with six fl.ounces of Syrup of Wild Cherry and half a pint of simple elixir. To make Syrup of Liquorice, mix two fl.ounces of the Fluid Extract with 14 fl.ounces of Syrup.

1682. Fluid Extract of Opium, Aqueous.—Powdered Opium, 4 ounces av., Glycerin, 5 fl.ounces, Water, a sufficient quantity. Pour 8 ounces of Boiling Water upon the Opium, and after macerating for 2 hours, having covered the perforated diaphragm of the water-bath percolator with a coarse piece of muslin, pour the mixture upon it, heat to about 185° F. and begin to percolate, adding Water to the drug and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate by means of a water-bath until it is reduced to 10 fl.ounces, filter and add enough Water through the filter to make the measure 11 fl.ounces, then add the Glycerin to make a pint of the Fluid Extract. Each minim of this Extract represents about $\frac{1}{4}$ grain Opium. Manufacturers have no definite standard for Fluid Extract of Opium, many of them making it only the same strength as the Tincture.

The Br. P. directs *Liquid Extract of Opium* to be made so that the finished product shall contain 5 per cent. of Opium.

1683. Fluid Extract Senega, Aqueous—For making Syrup of Senega.

—Senega Root in No. 20 powder, $16\frac{2}{3}$ ounces av., Glycerin, 5 fl.ounces, Water of Ammonia, $\frac{3}{4}$ fl.ounces, Water, a sufficient quantity. Moisten the powder with 10 ounces of Water and macerate for 24 hours, then pack moderately in the water-bath percolator; pour upon it a pint of Water, heat very moderately and after one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate to 10 fl.ounces, add the Ammonia and strain through muslin, adding through the strainer enough Water to make the measure 11 fl.ounces, and then add the Glycerin to make a pint of the Fluid Extract. In evaporating this Extract quite a precipitate of albuminous and starchy matter is formed; when the Water of Ammonia is added the valuable por-

tion of this precipitate, *Polygalic Acid*, is dissolved, and the remainder, which is worthless, is retained on the filter.

To make Syrup of Senega mix 2 fl.ounces of this Extract with 14 fl.ounces of Syrup.

1684. Fluid Extract Senna, Aqueous. — Senna, in No. 12 powder, $16\frac{2}{3}$ ounces av., Glycerin, 5 fl.ounces, Water, a sufficient quantity. Pour upon the Senna 4 pints of hot Water and steep with gentle heat for two hours, pour off the Liquid, press the drug gently, and reserve the liquid; pour two pints more of hot water upon it, steep for half an hour, pour off and press as before, adding the liquid to the reserved portion. Again pour on two pints of Water, steep, pour off and press as before, adding the liquid to the reserved portion. Evaporate the liquid to 10 fl.ounces, strain, add through the strainer enough Water to make 11 fl.ounces, and then add the Glycerin to make a pint of the Fluid Extract.

Aqueous Fluid Extract of Senna does not "gripe" as does that made with a partly Alcoholic menstruum. Senna leaves may be percolated first with Alcohol, to remove the principles which produce griping, and a fluid extract may then be made with Water or Diluted Alcohol, in the ordinary manner.

Etherial Fluid Extracts.

Among the first Fluid Extracts that were officinal in the U. S. were a number of preparations made with ether as a menstruum that are now classed as oleoresins. Manufacturers have furnished several Etherial Fluid Extracts which have had more or less reputation, but none are now official and they are rapidly going out of use, mainly because ether is an unstable and disagreeable vehicle for the exhibition of medicine. As Etherial Fluid Extracts may, however, be required, we give the following:

1685. General Formula for Etherial Fluid Extracts.

To complete the formula for any Fluid Extract in this class put the name of the drug and the fineness of powder required in the following formula:

The Drug, in No.	powder, . . .	$16\frac{2}{3}$ ounces av.
Ether,	} each, a sufficient quantity.	
Alcohol,		

Moisten the powder with from 6 to 8 fl.ounces of the Ether and pack quickly and firmly in the water-bath percolator, pour upon it sufficient Ether to saturate and barely cover the drug, and, having covered closely, set in a warm place for two days, then pour hot Water in the water-bath surrounding the percolator, and after one hour begin to percolate, adding Alcohol to the drug and continuing the percolation until the drug is exhausted. Reserve the first 14 fl.ounces that pass, evaporate the remainder by distillation to 2 fl.ounces and add to the reserved portion.

The Alcohol remaining in the drug may be recovered by distillation.

The following drugs are those from which Etherial Fluid Extracts are usually prepared. They may be made from any other drugs which contain Oleoresins or principles best soluble in Ether.

No.	LATIN NAME.	COMMON NAME.	Part Used.	Powder No.
1686	Cantharis.	Cantharides	Whole fly.....	60
1687	Cubeba.....	Cubeb	Fruit.....	60
1688	Digitalis.....	Digitalis or Foxglove...	Leaves	60
1689	Ergota	Ergot.....	Fungus	60

Fluid Extracts of Gums, Resins, Etc.

Liquid Extracts.

This class of preparations (which are not in fact Fluid Extracts as the term is generally applied, but which might much more properly be called Liquid Extracts) seem superfluous, and would not here be given but for the reason that they are quoted and supplied by many manufacturers and will therefore be demanded by many druggists.

They are seldom used except to prepare tinctures or other preparations which would be much better made from the substances themselves. They generally represent about 50 per cent. of the drug from which they are prepared, although it cannot be said for all of them that they represent as much as is claimed for them.

1690. Fluid Extract of Aloes—*Liquid Extract of Aloes*.—Socotrine Aloes in No. 50 powder 8 $\frac{1}{3}$ ounces av., diluted Alcohol a sufficient quantity.

Mix the Aloes with 10 fl.ounces of diluted Alcohol and heat moderately in a tightly-stopped, wide-mouth bottle on a water-bath, for three hours; then strain through muslin and add enough diluted Alcohol through the strainer to make a pint of the Fluid Extract.

To make the 1880 U. S. tincture, mix 3 fl.ounces each of the Fluid Extract of Aloes and the Fluid Extract of Liquorice Extract with 10 fl.ounces of diluted Alcohol.

1691. Fluid Extract Aloes and Myrrh — *Liquid Extract of Aloes and Myrrh*.—Socotrine Aloes in No. 50 powder 4 ounces av., Myrrh in No. 50 powder 4 ounces av., Alcohol a sufficient quantity. Mix the powders with 12 fl.ounces of Alcohol and macerate them for seven days in a warm place, then heat moderately on a water-bath for two hours and strain through muslin, adding through the strainer enough Alcohol to make a pint of the Fluid Extract.

To make Tincture of Aloes and Myrrh mix 6 fl.ounces of this Extract with 10 fl.ounces of Alcohol.

1692. Fluid Extract Asafetida — *Liquid Extract of Asafetida*.—Asafetida in coarse powder $8\frac{1}{3}$ ounces av., Alcohol a sufficient quantity. Mix the Asafetida with an equal bulk of rice chaff and pack moderately in the water-bath percolator; pour upon it sufficient Alcohol to saturate and cover the drugs, and set in a warm place for seven days; then heat very moderately and after one hour begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until a pint of the Fluid Extract has passed. This preparation seems entirely unnecessary, and would not be given here except that several manufacturers quote such a Fluid Extract for making Tincture of Asafetida.

To make Tincture of Asafetida mix $5\frac{1}{2}$ fl.ounces with 11 fl.ounces of Alcohol.

1693. Fluid Extract Benzoin — *Liquid Extract of Benzoin*.—Benzoin in No. 50 powder, $8\frac{1}{3}$ ounces av., Alcohol, a sufficient quantity. Mix the powder with a pint of Alcohol and macerate in a warm place for 3 days, then, having covered the perforated diaphragm of the water-bath percolator with a piece of coarse muslin or burlap, pour the mixture upon it, heat moderately for two hours; then begin to percolate slowly, adding Alcohol to the drug after the percolate has ceased to drop, and continuing the heat and percolation until a pint of the Fluid Extract is obtained.

To make Tincture of Benzoin mix 6 fl.ounces of this Fluid Extract with 10 fl.ounces of Alcohol.

1694. Fluid Extract Benzoin Compound — *Liquid Extract of Benzoin Compound*.—Benzoin, in No. 50 powder, $6\frac{1}{2}$ ounces av., Purified Aloes, No. 50 powder, 1 ounce av., Storax, $4\frac{1}{2}$ ounces av., Balsam Tolu, $2\frac{1}{4}$ ounces av., Alcohol, a sufficient quantity. Mix the gums with a pint of Alcohol and macerate in a warm place for 3 days, then, having covered the perforated diaphragm of the water-bath percolator with a piece of coarse muslin or burlap, pour the mixture upon it, heat moderately for two hours; then begin to

percolate, adding Alcohol to the drugs when the percolate has ceased to drop, and continuing the heat and percolation until a pint of the Fluid Extract is obtained.

To make Compound Tincture of Benzoin mix 4 fl.ounces of this Fluid Extract with 12 fl.ounces of Alcohol.

1695. Fluid Extract of Catechu — *Liquid Extract of Catechu.* — Catechu, in coarse powder, $8\frac{1}{2}$ ounces av., Alcohol, 4 fl.ounces, Water, a sufficient quantity. Mix the Catechu with a pint of Water, and heat it on a water-bath until the Catechu is dissolved; strain through coarse muslin and evaporate the liquid to 12 fl.ounces; when cool add the Alcohol, strain through muslin and add enough Water through the strainer to make a pint of the Fluid Extract.

To make Compound Tincture of Catechu mix $3\frac{3}{4}$ fl.ounces of this Extract with $2\frac{1}{2}$ fl.ounces of Fluid Extract of Cinnamon and enough Diluted Alcohol to make a pint.

1696. Fluid Extract of Guaiac — *Liquid Extract of Guaiac.* — Guaiac Resin, in coarse powder, $8\frac{1}{2}$ ounces av., Alcohol, a sufficient quantity. Mix the Guaiac with 12 fl.ounces of Alcohol in a wide mouth bottle, and heat moderately on a water-bath for 3 hours, then strain through muslin; add enough Alcohol through the strainer to make a pint of the Fluid Extract.

To make the Tincture, mix $5\frac{1}{2}$ fl.ounces with $10\frac{1}{2}$ fl.ounces of Alcohol.

1697. Fluid Extract Kino — *Liquid Extract of Kino.* — Kino in No. 40 powder, 6 ounces av., Glycerin, 4 fl.ounces, Alcohol, a sufficient quantity. Mix the Glycerin with 8 fl.ounces of Alcohol and, having mixed the Kino with the liquid in a wide mouth bottle, stop tightly, and heat gently on a water-bath until the Kino is dissolved, then strain through muslin and add through the strainer enough Alcohol to make the measure a pint.

Two fl.ounces of this Extract mixed with 11 fl.ounces of Alcohol and 3 fl.ounces of Water makes the official tincture.

1698. Fluid Extract Liquorice Extract — *Liquid Extract of Liquorice.* — Extract Liquorice, in No. 50 powder, 8 ounces av., Alcohol, 4 fl.ounces, Water, a sufficient quantity. Mix the Liquorice with a pint of Water and heat it on a water-bath until the Liquorice is dissolved: strain through muslin and evaporate to 12 fl.ounces; when cool add the Alcohol; strain through muslin, and add through the strainer enough Water to make a pint of the fluid extract.

1699. Fluid Extract Myrrh — *Liquid Extract of Myrrh.* — Myrrh in moderately fine powder $8\frac{1}{2}$ ounces av., Alcohol, a sufficient quantity. Mix the Myrrh with an equal bulk of rice chaff, pack it moderately in the water-bath percolator, pour upon it a pint of Alcohol and set in a warm place for seven days; then heat very moderately, and after one hour begin to percolate slowly, adding Alcohol to the drug and continuing the heat and percolation until 14 fl.ounces have passed, which reserve. Turn off the heat and continue the percolation with Alcohol until the drug is exhausted. Distill the Alcohol from this last portion until only two ounces remain, which add to

the reserved portion to make a pint of fluid extract. To make Tincture of Myrrh, mix $5\frac{1}{2}$ fl.ounces of this fluid extract with enough Alcohol to make a pint.

1700. Fluid Extract Opium—*Liquid Extract of Opium.*—Opium in coarse powder 4 ounces av., Alcohol 8 fl.ounces, Water 8 fl.ounces, Diluted Alcohol, a sufficient quantity. Mix the Opium with half a pint of Water, and having covered the perforated diaphragm of the water-bath percolator with a piece of burlap pour the mixture upon it and set in a warm place for two days, then heat to about 80° C. (176° F.) for four hours, add half a pint of Alcohol, and after half an hour begin to percolate, adding Diluted Alcohol to the drug and continuing the heat and percolation until 14 fl.ounces have passed, which reserve. Continue the percolation with Diluted Alcohol until the drug is exhausted. Distill the Alcohol ($\frac{1}{2}$ the measure) from this last portion and evaporate the residue to a soft extract, which dissolve in the reserved portion and add enough Diluted Alcohol to make a pint of the fluid extract. To make Tincture Opium, U. S., 1870, mix $5\frac{1}{2}$ fl.ounces of this fluid extract with enough Diluted Alcohol to make a pint. To make Tincture Opium, U. S., 1880, mix $6\frac{1}{4}$ fl.ounces of this fluid extract with enough Diluted Alcohol to make a pint. There is no particular standard among manufacturers for making this fluid extract, many of them making it of the same strength as Tincture of Opium. We have adopted this standard because it seems best adapted to the wants and uses of druggists. Four minims represents a grain of Opium.

1701. Fluid Extract of Opium, Deodorized—*Liquid Extract of Opium, Deodorized.*—Opium in coarse powder 4 ounces av., Gasoline (Petroleum Ether), 8 fl.ounces, Alcohol, 4 fl.ounces, Water, a sufficient quantity. Mix the Opium with a pint of Water, and having covered the perforated diaphragm of the water-bath percolator with a piece of burlap pour the mixture upon it and set in a warm place for two days; then heat to about 85° C. (185° F.) for four hours, and begin to percolate, adding Water to the drug and continuing the heat and percolation until the drug is exhausted. Evaporate the percolate to half a pint, and when cool mix with it, in a quart bottle, half a pint of Gasoline, and agitate them frequently during 24 hours; then filter the mixture through a calico strainer, without pressure, and afterward pour the Gasoline from the purified solution; evaporate by water-bath until no odor of Gasoline remains; filter, and add to the filtrate 4 fl.ounces of Alcohol and enough Water to make a pint of the fluid extract. To make the 1870 strength Deodorized Tincture of Opium, mix $5\frac{1}{2}$ fl.ounces of this fluid extract with 3 fl.ounces of Alcohol and enough Water to make a pint. To make the 1880 Tincture, mix $6\frac{1}{4}$ fl.ounces of this fluid extract with 3 fl.ounces of Alcohol and enough Water to make a pint.

1702. Fluid Extract Opium, Camphorated—*Concentrated Extract of Paregoric.*—Powdered Opium 1 ounce av., Benzoic Acid 1 ounce av., Camphor $\frac{3}{4}$ ounce av., Oil of Anise 1 fl.ounce, Alcohol 12 fl.ounces, Water, a

sufficient quantity. Macerate the Powdered Opium with 2 ounces of hot Water for two hours. Dissolve the Benzoic Acid, Camphor and Oil of Anise in the Alcohol, and having mixed the solution with the pulpy Opium mass, macerate it for seven days, then filter through paper, adding enough Alcohol through the filter to make a pint of the fluid extract.

To make Paregoric, mix 1 fl.ounce of this Extract, 1 fl.ounce of Glycerin, and 14 fl.ounces of Diluted Alcohol. This may be colored by adding to it half a fl.drachm of fluid extract of Liquorice Extract.

1703. Fluid Extract Tolu — *Liquid Extract of Tolu*.— Balsam of Tolu $8\frac{1}{3}$ ounces av., Alcohol, a sufficient quantity. Mix the Balsam with 8 ounces of Alcohol in a wide mouth bottle, and, having stopped it tightly, heat on a water-bath until the Balsam is dissolved; then strain through muslin and add enough Alcohol through the strainer to make a pint of the fluid extract.

To make the 1870 Tincture of Tolu, mix $3\frac{1}{4}$ fl.ounces of this extract with enough Alcohol to make a pint.

To make the 1880 Tincture, mix $2\frac{3}{4}$ ounces with enough Alcohol to make a pint.

FEL BOVIS — OX-GALL.

Ox-gall is the fresh fluid obtained from the gall bladder of *Bos Taurus*. In domestic medicine and the treatment of domestic animals, it is considerably used as an ingredient of liniments and lotions. In pharmacy it is used to prepare more permanent preparations of Ox-gall, which are as follows, the first two being official in the U. S.

1704. Fel Bovis Inspissatum — *Inspissated Ox-gall*.— Made by heating fresh Ox-gall 100 parts or 10 ounces to a temperature not exceeding 80°C . (176°F .), straining through muslin, and evaporating the strained liquid on a water-bath to 15 parts, or $1\frac{1}{2}$ ounce. This is chiefly used as an ingredient in pills. The dose is 5 to 15 grains.

1705. Fel Bovis Purificatus — *Purified Ox-gall*.— Made by evaporating 3 parts or 16 fl.ounces of fresh Ox-gall on a water-bath to 1 part or $5\frac{1}{3}$ fl.ounces; then adding 1 part or 6 fl.ounces, agitating, and setting aside for 24 hours, then decanting and filtering, distilling off the alcohol and evaporating the residue to pilular consistence. The uses and dose are the same as the preceding.

1706. Fel Bovis Preparatus — *Prepared Ox-gall*.— The liquid Ox-gall is frequently required in liniments, and, as the fresh Ox-gall will not keep, the following formula for a permanent liquid preparation is presented:

Ox-gall, fresh, 16 fl.ounces; Alcohol, 5 fl.ounces; evaporate the Ox-gall at a temperature not exceeding 80°C . (176°F .) to 12 fl.ounces; add the Alcohol, allow to stand 24 hours, and decant the clear liquid.

1707. FERMENTUM — YEAST.

The ferment obtained in brewing beer and by various other processes is a vegetable growth (*Cerevisia Fermentum*), which varies somewhat with the substance in which it is developed. It appears as a foam or froth upon the surface of the fermenting liquid, and is instrumental in converting the sugar of the solution into alcohol with the evolution of CO_2 . It may be cultivated by the addition of a little yeast to any saccharine solution. It is used in medicine as a poultice for gangrene and ulcers and is given in diabetes. In the form of *Vienna Yeast*, which is prepared by fermenting an infusion of maize and rye with barley malt, and preserved in various other forms, it is a well known article of household use.

FERRUM — IRON.

Symbol, Fe; Atomic weight, 55.9; Sp. gr. 7.84.

Iron is the most useful, abundant, and widely distributed of the metals, and in pharmacy, as well as in the arts, holds the first place for utility and value.

It occurs in nature in the form of ores, and is only prepared in metallic form on a large scale. It melts at about 3300°F . Heated with carbon it forms *steel*. It combines chemically with all the non-metals except hydrogen and nitrogen, and with most of the metals and the acids, forming a great variety of important salts.

In the metallic state Iron is employed in pharmacy in the form of fine bright annealed *iron wire*, which is chosen on account of its purity and cheapness. *Reduced Iron* in the form of powder is also employed for some purposes. In manufacturing chemicals in a large way coarser iron is used and the salts obtained purified by various means. Iron is the base of two important series of salts, *ferrous* and *ferric*, in the former acting as a dyad and in the latter as a hexad.

Ferrum Pulveratum — *Powdered Iron* — is official in the G. P. and is considerably used in European countries. It is

made from good cast iron and contains some carbon. It is known as *Limatura Martis Præparata*.

The following are the official Iron salts:

1708. Ferrum Redactum.

Reduced Iron.

Sub-carbonate of Iron is first thoroughly washed with water until freed from all traces of sulphate of sodium, then calcined until free from moisture, and placed in a reduction tube heated to dull redness, through which a current of purified hydrogen gas is made to pass for from 5 to 8 hours, or until the oxygen of the iron salt has completely combined with the hydrogen and escaped in the form of steam, leaving the reduced metallic iron in the form of a fine grayish powder.

Uses.—Reduced Iron or *Quevenne's Iron by Hydrogen*, as it is frequently called, is used in pharmacy for making pills, lozenges, etc., and may be used instead of iron-wire for making fine preparations, but is too expensive for general use. The dose is from 2 to 5 grains.

1709. Ferri Arsenias, Br.

Arseniate of Iron.

This is prepared according to the Br. P., by dissolving $20\frac{3}{4}$ ounces av. of Sulphate of Iron in about one gallon of water, and $15\frac{3}{4}$ ounces av. of Arseniate of Sodium, dried at 300° F., in about 6 pints of water, mixing the solutions and adding to the mixture $4\frac{1}{2}$ ounces av. of Bicarbonate of Sodium dissolved in a little distilled water. The mixture is then thoroughly stirred and the precipitate allowed to settle, and washed as is directed for washing precipitates (page 44), until the washings show no reaction with a dilute solution of chloride of barium. The precipitate is then collected, drained, squeezed, and dried on porous bricks in a warm-air chamber, at a temperature not exceeding 100° F.

Uses.—This salt is used as an alterative chalybeate, in doses of $\frac{1}{16}$ to $\frac{1}{2}$ grain.

1710. Ferri Carbonas Saccharatus.*Saccharated Carbonate of Iron.*

This salt is official in the U. S., Br., and G. Pharmacopœias, the method of preparing being slightly different in each, but the resulting preparation being about the same.

The U. S. formula is:

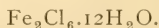
Sulphate of Iron, 10 parts or 10 ounces.
 Bicarbonate of Sodium, . . 7 parts or 7 ounces.
 Sugar, in fine powder, . . . 16 parts or 16 ounces.
 Distilled Water, a sufficient quantity.

The Sulphate of Iron is to be dissolved in 40 fl.ounces of hot distilled Water, and the Bicarbonate of Sodium in about 6 pints of warm distilled Water. The solutions are to be filtered separately while hot, and the Iron solution gradually added to the solution of Soda, and the resultant precipitate washed with boiling distilled Water as directed (page 44), until the washings give no reaction with test solution Chloride of Barium. The precipitate is then to be collected, drained quickly and pressed, and mixed with the sugar in a porcelain capsule, then evaporated by means of a water-bath to dryness, reduced to powder, and kept in small, well-stopped vials.

It contains about ten per cent. of Iron.

This should not be mistaken for the *Subcarbonate of Iron*, also called *Carbonate of Iron*, which was formerly official.

Uses.—This salt is used as an Iron tonic, in doses of from 5 to 30 grains.

1711. Ferri Chloridum.*Chloride of Iron—Ferric Chloride.*

This is official in the U. S. P., and is prepared as follows:

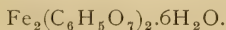
Iron Wire, cut in fine pieces 15 parts or 4 ounces av.
 Hydrochloric Acid, . . . 86 parts or 19 fl.ounces.
 Nitric Acid,
 Distilled Water, each a sufficient quantity.

Put the Iron Wire into a quart flask and pour upon it 54 parts or 12 fl.ounces of the Hydrochloric Acid, previously mixed with 25 parts or 6 fl.ounces of Water. Let the mixture stand until effervescence ceases, then heat to boiling and filter the solution through paper, adding a little boiling distilled Water to the Iron Wire in the flask to rinse it, and passing the rinsing through the filter. To the filtered liquid add 27 parts or 6 fl.ounces of Hydrochloric Acid and pour the mixture slowly and gradually in a stream into 8 parts or 12 fl.drachms of Nitric Acid; heat by means of a sand-bath until nitrous fumes cease to be evolved, then test a small portion with a freshly-prepared test solution of Ferricyanide of Potassium. If a blue color results add a little more Nitric Acid and evaporate off the excess as before. Then add the remaining 5 parts or 1 fl.ounce of Hydrochloric Acid and enough distilled Water to make the whole weigh 60 parts or 16 ounces av., and set aside, covered with glass, until it forms a solid crystalline mass. Finally, break up the mass and keep in glass-stopped bottles, protected from light.

Uses.—This salt is used externally as a styptic and in solution as an application for sore throat, diphtheretic growths, ulcers, etc. Also, as a tonic, in doses of 3 to 5 grains.

1712. Ferri Citras. U. S.

Citrate of Iron — Ferric Citrate.



This is directed to be made by evaporating solution of Citrate of Iron, at a temperature not exceeding 60° C. (140° F.), to the consistence of Syrup, and spreading it on glass so that when dry the salt may be obtained in scales.

This salt should not be confounded with the Ammonio-Citrate of Iron, which is very much more soluble.

This salt, being very slowly soluble, is used chiefly for making pills, for which it is better adapted than the soluble salt. The dose is 5 to 20 grains.

The solution of Citrate of Iron from which this salt is prepared yields 50 per cent. of the scaled salt.

1713. Ferri et Ammonii Citras.

Citrate of Iron and Ammonium — Soluble Citrate of Iron — Ammonio-Ferric Citrate.

The U. S. P. directs this to be prepared from the U. S. official solution of Citrate of Iron by mixing 3 parts or 1 pint with 1 part or 7 fl.ounces of Water of Ammonia and evaporating the mixture at a temperature not exceeding 60° C. (140° F.) to the consistence of syrup, which is to be spread upon glass, so that, when dry, the salt may be obtained in scales. It is more commonly known as Soluble Citrate of Iron, and should be used in making elixirs, syrups, and all preparations in which a soluble salt is desired.

Uses.—This is the soluble Citrate of Iron which is employed for nearly all purposes, except making pills. The dose is from 5 to 20 grains.

1714. Ferri et Quininae Citras.

Citrate of Iron and Quinine.

The U. S. P. directs this salt to be made as follows :

Citrate of Iron (1712), . 88 parts or 11 ounces av.

Quinine (Alkaloid), dried at 100° C.

(212° F.), until it ceases to lose

weight, 12 parts or 1½ ounces av.

Distilled Water a sufficient quantity.

Dissolve the Iron Salt in 160 parts or 19 fl.ounces of Distilled Water, by heating on a water-bath at a temperature not exceeding 60° C. (140° F.). To this solution add the Quinine and stir constantly until dissolved; then evaporate the solution at the temperature previously stated to the consistence of syrup, and spread on glass, so that when dry the salt may be obtained in scales.

Uses.—This salt contains 12 per cent. of Quinine, is not very soluble and is much used for making Bitter Wine of Iron and other tonics, and for making pills. The dose is from 5 to 10 grains.

Citrate of Iron Quinine and Strychnine is not an official salt, but may be made by adding 1 part or 65 grains of Strychnine (Alkaloid) to the above formula, at the same time the Quinine is added. This contains 12 per cent. of Quinine and 1 per cent. of Iron. It is sometimes used for making Elixirs or Syrups of Iron Quinine and Strychnine, and in making pills.

This scale salt and the Citrate of Iron and Quinine, as found in the market, generally contain only 10 per cent. of Quinine.

1715. Ferri et Strychninæ Citras.

Citrate of Iron and Strychnine.

The U. S. P. directs this salt to be made from :

Citrate of Iron and Ammonium,	98 parts, or 490 grains.
Strychnine	1 part or 5 grains.
Citric Acid	1 part or 5 grains.
Distilled Water	120 parts or 11 fl.drachms.

Make in the same manner as directed for Citrate of Iron and Quinine. It contains 1 per cent. of Strychnine and is used as a bitter tonic in doses of 3 to 5 grains.

1716. Ferri et Ammonii Sulphas.

*Sulphate of Iron and Ammonium — Ammonio-Ferric Sulphate—
Ammonio-Ferric Alum.*

No process for making this salt is now official, but it may be prepared by heating a pint of Solution of Tersulphate of Iron to boiling and adding to it 2½ ounces av. of Sulphate of Ammonium, stirring until dissolved and setting aside to crystallize. This salt readily deliquesces in warm weather. It is used as a styptic, generally in solution.

1717. Ferri et Ammonii Tartras.

Tartrate of Iron and Ammonium — Ammonio-Ferric Tartrate.

Dilute 90 parts, or 13 fl.ounces, of Solution of Tersulphate of Iron with 900 parts or 10 pints, of cold Water; dilute 72 parts

or $14\frac{1}{2}$ fl.ounces, of Water of Ammonium with 180 parts or $2\frac{1}{4}$ pints of cold Water. Mix the two liquids and wash the precipitate produced as directed (page 44), until the washings cause but a slight turbidness to test solution of Chloride of Barium. Drain and press the precipitate; dissolve 30 parts or 6 ounces av. of Tartaric Acid in 130 parts or $1\frac{1}{2}$ pints of Distilled Water, neutralize the solution exactly with Carbonate of Ammonium, then add 30 parts, or 6 ounces, more of Tartaric Acid and dissolve by gentle heat; in this solution while still warm dissolve the moist Iron Precipitate, adding a small portion at a time until no more will dissolve, then filter the solution, evaporate the filtrate to the consistence of syrup and spread upon glass, so that when dry the salt may be obtained in scales.

Uses.—This salt is used as a mild iron tonic in doses of 5 to 20 grains.

1718. Ferri et Potassii Tartras.

Tartrate of Iron and Potassium — Potassio-Ferric Tartrate, U. S.— Tartrated Iron, Br.

Mix 13 fl.ounces of Solution Tersulphate of Iron with 9 pints of cold Water. Mix 15 fl.ounces of Water of Ammonia with 2 pints of cold Water, add the Iron Solution to the Ammonia solution, precipitate, wash, drain, etc., as directed in the previous formula. Put the drained precipitate into a stone ware or porcelain vessel, and add to it 3 pints of distilled Water, heat the mixture on a water-bath to a temperature not exceeding 60° C. (140° F.), add to it 6 ounces av. of Bitartrate of Potassium, and stir until the iron precipitate is dissolved, filter while hot and let the filtrate stand in a cool place for 24 hours, then stir it well and cautiously add just enough Water of Ammonia to dissolve the precipitate. Evaporate the solution to the consistence of a thick syrup, and spread upon glass so that, when dry, the salt may be obtained in scales.

This is a mild, ferruginous tonic, and may be given in doses of 10 to 30 grains.

1719. Ferri Hypophosphis.*Hypophosphite of Iron — Ferric Hypophosphite.*

No official process is given for making this salt; but the most convenient method is by the double decomposition of Sulphate of Iron and Hypophosphite of Calcium. 480 grains of pure Ferrous Sulphate in Crystals is dissolved in a pint of hot Water and the solution added to a solution of 326 grains of Hypophosphite of Calcium in a pint of cold Water. Sulphate of Calcium is precipitated and ferrous hypophosphite held in solution, the solution is evaporated, and the ferrous becomes a ferric salt, known as Hypophosphite of Iron.

Uses.—This salt is given in the form of pills or powders, and is somewhat used in making solutions and syrups of the Hypophosphites but it is not very soluble. The dose is 3 to 10 grains.

1720. Ferri Iodidum Saccharatum.*Saccharated Iodide of Iron — Saccharated Ferrous Iodide.*

The U. S. P. directs this preparation to be made as follows:

Iron Wire, cut fine, . . .	6 parts or 60 grains.
Iodine,	17 parts or 170 grains.
Distilled Water,	20 parts or 3 fl.drachms.
Sugar of Milk,	80 parts or 800 grains.

Mix the Iron, Iodine and distilled Water in a thin glass flask, shake the mixture occasionally until the reaction ceases and the solution has acquired a green color, and lost the smell of Iodine; then filter through a wetted filter into a porcelain capsule containing 40 parts or 400 grains of Sugar of Milk. Rinse the flask and Iron Wire with a little distilled Water and pass the rinsings through the filter into the capsule, and evaporate on a water-bath, stirring constantly until a dry mass remains. Transfer the mass quickly to a heated iron mortar containing the remainder of the Sugar of Milk and rub them

well together. Transfer at once to dry bottles, which must be well stopped and kept cool and dark.

Uses.—This salt is not very stable after it is opened, and is apt to decompose with the liberation of Iodine. It is used in making pills and in powders, and may be given in doses of 1 to 5 grains.

Iodide of Iron in the form of a solution is official in the G. P. and is made by mixing Powdered Iron 30 parts, with Water 100 parts, and gradually adding Iodine 82 parts, with constant stirring. The solution is then filtered and a little water added through the filter. This is a liquid, which may be evaporated to a mass FeI_2 when required for pills.

The *Iodide of Iron* — FeI_2 — Formerly official in the Br. P. was prepared by mixing $1\frac{1}{2}$ ounce of Iron Wire with 3 ounces of Iodine and 12 ounces of Water in a flask, heating gently for 10 minutes, and then boiling until the froth becomes white. The solution is then rapidly filtered through a calico filter and boiled down until a drop solidifies upon cooling.

Tasteless Iodide of Iron in the form of a salt is made after a process patented by J. Cruse, by adding Citrate of Sodium or Potassium to the solution as above prepared, sufficient to deprive it of its peculiar ferruginous taste, and then evaporating. It is used in making several tasteless preparations of Iodide of Iron.

1721.

Ferri Lactas.

Lactate of Iron — Ferrous Lactate.



No official process is now given for making this salt, but it was formerly prepared by mixing 240 grains of Iron filings with Lactic Acid 1 fl.ounce and distilled water a pint, heating the mixture by water-bath, and adding a little distilled water from time to time to preserve the measure. When the action has ceased, filter the solution while hot and set aside to crystallize; after two days decant the liquid, collect the crystals,

wash them with a little alcohol and dry on bibulous paper. More crystals may be obtained by evaporating the poured off liquid and again crystallizing.

Uses.—Lactate of Iron is given for the same purpose as other mild Iron salts. It is also used for making some syrups and elixirs. The dose is from 1 to 5 grains.

1722. **Ferri Oxalas.**

Oxalate of Iron — Ferrous Oxalate.



This salt may be made by dissolving 960 grains of Sulphate of Iron in a quart of water; 436 grains of Oxalic Acid in a pint of water, adding the Iron solution to the Acid solution, and washing the precipitate which results as directed (page 44), then drying it by gentle heat.

It is but little used in medicine; the dose is 2 to 3 grains.

1723. **Ferri Oxidum Hydratum.**

Hydrated Oxide of Iron — Ferric Hydrate.

Solution of Tersulphate of Iron, 10 parts or 6 fl.ounces.

Water of Ammonia, 8 parts or 6½ fl.ounces.

Water, a sufficient quantity.

Dilute the Water of Ammonia with 20 parts or 1 pint of cold water, and the Iron solution with 100 parts or 5 pints of cold water; add the Iron solution, with constant stirring, to the Ammonia solution and wash the precipitate which results as directed (page 44). Then press and add enough water to the mass to make the whole weigh 20 parts or 1 pound av. This is known as *moist Oxide of Iron*.

Uses.—When freshly prepared this is used as an antidote to Arsenical poisoning, and for detannating preparations as elixirs, etc., which are to be combined with salts or solutions of Iron. It loses its value by standing. The Br. P. directs Hydrated Peroxide of Iron to be prepared with solution of soda instead of Ammonia; but the result is the same.

1724. Ferri Oxidum Hydratum cum Magnesia.

Hydrated Oxide of Iron with Magnesia.

This U. S. official is intended to be kept conveniently at hand as an antidote for arsenical poisoning. The ingredients are to be mixed when wanted for use.

Solution Tersulphate

of Iron, 1,000 grains, or $1\frac{3}{4}$ fl.ounce.

Magnesia (*Calcined*), . . . 150 grains.

Water a sufficient quantity.

Mix the solution with twice its weight of water, and keep the mixture in a well-stopped bottle properly labelled. Rub the magnesia with water to a smooth thin mixture, transfer to a quart bottle properly labelled and fill the bottle with water. When wanted for use mix the two liquids by adding the magnesia mixture gradually to the Iron solution, and shaking them well together.

Uses.—In arsenic poisoning this mixture as thus prepared is freely given, the whole quantity sometimes being used.

1725. Ferri Phosphas.

Phosphate of Iron—Ferric Phosphate.

This new U. S. official Iron Salt in scales being soluble, is intended to fill the place of the gray powder, which has formerly been used as Phosphate of Iron (Ferrous Phosphate), which was insoluble.

Citrate of Iron, 5 parts or 5 ounces av.

Phosphate of Sodium, . . . 6 parts or 6 ounces av.

Distilled Water, 10 parts or 10 fl.ounces.

Dissolve the Citrate of Iron in the Distilled Water by heating on a water-bath, add the Phosphate of Sodium to the solution, and stir until dissolved, then evaporate the solution at a temperature not exceeding 60°C . (140°F .) to the consistence of

a thick syrup, and spread upon glass, so that when dry it may be obtained in scales.

Uses.—In pharmacy this salt is now much used in making elixirs, syrups, etc., instead of the Pyrophosphate of Iron, which was formerly directed, as it is less sensitive to excess of acid, and more permanent in solution. In medicine it may be given as a mild Iron tonic in doses of 5 to 10 grains.

Phosphate of Iron (Ferrous Phosphate) — $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$.—The grayish or slate-blue amorphous powder which was formerly official in the U. S. P. is still retained in the Br. P. It is made by precipitating a solution of 3 ounces of Sulphate of Iron in 30 ounces of Water, with a solution of $2\frac{3}{4}$ ounces of Phosphate of Sodium and $\frac{3}{4}$ ounce Bicarbonate of Sodium in 30 ounces of Water, washing the precipitate and drying at a temperature not exceeding 120°F .

1726. Ferri Pyrophosphas.

Pyrophosphate of Iron — Ferric Pyrophosphate.

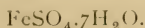
Citrate of Iron, 9 parts or 9 ounces av.
Pyrophosphate of Sodium, . 10 parts or 10 ounces av.
Distilled Water, 18 parts or 18 fl.ounces.

Dissolve the Citrate of Iron in the Distilled Water by heating on a water-bath, and add to the solution the Sodium salt, stirring until dissolved; then evaporate the solution to the consistence of a thick syrup and spread upon glass, so that when dry it may be obtained in scales. It is precipitated from its solution by excess of acid.

Uses.—This salt has been much used in making elixirs, syrups, solutions, etc., and is also employed in pills and powders. The dose is 2 to 5 grains.

1727. Ferri Sulphas.

Sulphate of Iron — Ferrous Sulphate.



This salt, which is familiarly known as “Copperas,” is usually made on a large scale by manufacturing chemists from scrap

iron and oil of vitriol, and purified for pharmaceutical use. It may be made according to the Br. P. by dissolving 4 ounces av. of Iron Wire with 4 fl.ounces (Imperial measure) of Sulphuric Acid mixed with 30 fl.ounces of distilled Water. When the disengagement of hydrogen gas has nearly ceased, boil for 10 minutes; then cool, filter the solution and set aside to crystallize. After 24 hours collect the crystals, drain on porous bricks, and when dry preserve in stoppered bottles.

Uses.— Sulphate of Iron is the basis of many of the other salts of Iron, which are made by decomposing it. It is quite astringent, and is used as a tonic astringent, both externally and internally. The dose is 1 to 2 grains. The commercial Sulphate of Iron (Copperas) is considerably used as a disinfectant and as a wash for trees to prevent worms and bugs.

Sulphate of Iron and Ammonium, or *Iron Alum*, is a double salt of Iron, used in photography and other arts, and also given for the same purposes as Sulphate of Iron. (See 1716.)

1728. Ferri Sulphas Exsiccatus.

Dried Sulphate of Iron.

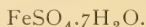


This is prepared by heating Sulphate of Iron in an unglazed earthen vessel moderately, until it has effloresced, then increasing the heat to 149°C . (300°F .), and maintaining it at that temperature until it ceases to lose weight, and, lastly, reducing it to a fine powder.

Uses.— This is chiefly used in making pills, but is sometimes prescribed in powders.

1729. Ferri Sulphas Præcipitatus.

Precipitated Sulphate of Iron or Ferrous Sulphate — Granulated Sulphate of Iron.



Sulphate of Iron, . . . 100 parts or 4 ounces av.

Distilled Water, . . . 170 parts or $6\frac{1}{2}$ fl.ounces.

Sulphuric Acid, . . . 4 parts or 38 minims.

Alcohol, a sufficient quantity.

Dissolve the Iron salt in the Water, previously mixed with the Acid, and filter the solution; then pour it gradually, with constant stirring, into an equal volume, about 8 fl.ounces, of Alcohol, and set aside for 24 hours. Collect and drain the precipitate, wash with Alcohol in a funnel until neutral, press and dry without artificial heat and keep in well-stopped bottles.

Uses.—This is the same as Sulphate of Iron, but purified, and is more convenient to use in making powders, pills, etc. It is also much less liable to change than the crystalline salt. The dose is 1 to 2 grains.

1730. Ferri Valerianas.

Valerianate of Iron — Ferric Valerianate.



This may be made by mixing solutions of Sulphate of Iron and Valerianate of Sodium. Ferric Valeriate is precipitated, and may be washed and dried.

Uses.—This is but little used in pharmacy and is seldom prescribed. It is given as a tonic nervine, in doses of from 1 to 10 grains.

Other Salts of Iron.

Besides the foregoing salts of Iron, which are official, are several others, which are more or less used in pharmacy:

1731. Acetate of Iron — $\text{Fe}_2(\text{C}_2\text{H}_3\text{O}_2)_6$.—Made by dissolving freshly precipitated Hydrated Oxide of Iron to saturation in Acetic Acid, evaporating the solution and crystallizing.

1732. Benzoate of Iron — $\text{Fe}_26\text{C}_7\text{H}_5\text{O}_2.6\text{H}_2\text{O}$.—By adding a solution of Sulphate of Iron to a concentrated solution of Benzoate of Sodium, collecting the precipitate, washing, and drying.

1733. Bromide of Iron — FeBr_2 .—By adding 2 parts of Bromine diluted with 10 parts of Water to 1 part Iron Wire, and digesting with gentle heat until the liquid assumes a greenish color and the reaction is completed, then filtering and evaporating to dryness.

1734. Carbonate or Subcarbonate of Iron.—By dissolving 4 ounces of Sulphate of Iron and $4\frac{1}{2}$ ounces of Carbonate of Sodium, separately, each in 2 quarts of warm Water, mixing the solutions and washing the precipitate

with sweetened Water, and drying without heat. By exposure this is converted into Ferrous Oxide.

1735. Ferrocyanide of Iron— $\text{Fe}_4(\text{FeCN}_6)_3$.—By dissolving Ferrocyanide of Potassium and adding to it a solution of Sulphate of Iron as long as the blue precipitate is formed, then washing the precipitate and drying. This is known commercially as *Prussian Blue*. It is made soluble by the addition of 20 per cent. or more of Oxalic Acid, and is then known as *Soluble Blue*, an article much sold for laundry bluing.

1736. Nitrate of Iron— $\text{Fe}_2(\text{NO}_3)_6$.—By concentrating a solution of Nitrate of Iron by evaporation and crystallizing.

1737. Oxides of Iron.—With Oxygen Iron combines in several proportions. *Ferrous Oxide* FeO being unknown except in chemistry, as it rapidly absorbs oxygen and passes into a higher oxide. *Ferric Oxide* Fe_2O_3 which is made by burning ferrous sulphate in a crucible until fumes cease to be evolved. This is known commercially as *Crocus Martis*, *Colcothar*, *Rouge*, *Red Oxide of Iron*, *Venetian Red*, etc., as made for various uses. *Magnetic Oxide of Iron*—*Ferroso-Ferric Oxide*— Fe_3O_4 —a black magnetic Oxide of Iron obtained in various ways and also occurring native; and some other forms not sufficiently important to notice. The German Pharmacopœia directs a *soluble saccharated Oxide of Iron* to be prepared by precipitating 30 parts of a solution Chloride of Iron, with a solution of Carbonate of Sodium, adding solution of soda and of Bicarbonate of Sodium, washing the precipitate under water and mixing it with 50 parts of sugar and drying.

1738. Persulphate of Iron—*Monsell's Salt*.—By evaporating a solution of persulphate or tersulphate of Iron to dryness. Used as a styptic.

1739. Phosphate of Iron, White— $\text{Fe}_2 2\text{PO}_4 \cdot 4\text{H}_2\text{O}$.—Besides the official scale salt, Phosphate of Iron (a compound salt) and the former official gray powder, Phosphate of Iron (Ferrous Phosphate), a *White Phosphate of Iron* (Ferric Phosphate) is made by mixing 4 ounces of solution of normal ferric sulphate, with 1 ounce Acetate of Sodium in solution, and then adding a solution of Phosphate of Sodium, and washing and drying the precipitate.

1740. Sulphide of Iron— FeS .—Made by heating a mixture of 3 parts iron filings with 2 parts of sublimed sulphur in a red hot crucible, into which it is introduced in small portions at a time. This is used for making sulphuretted hydrogen.

Iron Pyrites FeS_2 is another combination of Iron with sulphur, found abundantly in nature.

Some other salts of Iron are used occasionally, but are seldom prepared by pharmacists and are of but little interest. Of the unofficial salts of Iron not previously mentioned the more important are the Lacto-Phosphate, Salicylate, Succinate, Sulpho-Carbolate, Malate, and Tannate. Dialysed Iron in scales is mentioned on page 273. and the various solutions of Iron among the solutions.

FLUORINE.

Symbol F.; Atomic weight, 19.

The element Fluorine has until recently resisted all attempts to isolate it, but its isolation has lately (November, 1886,) been accomplished by M. H. Moissan of Paris, who obtained it as a colorless inflammable gas, from anhydrous fluoric acid, by electrolysis. It is classed chemically with the *halogens*, chlorine, bromine, and iodine, as its compounds are similar.

It is chiefly known by its compound with hydrogen, *Hydrofluoric Acid*, which reacts with metals, forming salts called *Fluorides*. It also combines with boron and silicon forming gaseous compounds.

1741. Hydrofluoric Acid — HF. — This is prepared by pouring concentrated Sulphuric Acid upon finely powdered Fluor Spar in a capacious leaden retort, gentle heat is then applied and the gas which is evolved is collected in a leaden receiver surrounded by ice. It is a colorless fluid vaporizing at 59° F., and is chiefly known by its property of corroding glass. It is much used for etching on glass. It must be kept in leaden bottles.

GELATINA — GELATIN.

When animal tissues, bones, tendons, ligaments, etc., are boiled for some hours in water, and the water allowed to stand sometime after becoming cold, a mass resembling jelly is obtained. The finer varieties of this jelly thus prepared are purified, evaporated to the proper consistence, spread into sheets, dried on nets, and are known as *Gelatin*. The coarser varieties, made from hoofs, hides and other refuse animal substances, are made into *Glue* of various grades. *Isinglass*, or *Fish-glue*, is a species of Gelatin prepared from the air bladders of certain fish; but common Gelatin is often called Isinglass.

Gelatin, prepared in various ways, is largely consumed as an article of food; in the arts it is extensively used for adhesive

purposes, for making Gelatin compositions, for making Gelatin plates for photography, etc.; in pharmacy it is employed for coating pills, making capsules, suppositories, etc., for fining wines and liquors, and for many other useful purposes.

1742. Gelatin Capsules.—A solution of 1 part of Cox's or French Gelatine in 4 parts of Water is made by first soaking the Gelatin for an hour or two in the Water, then heating until the Gelatin is dissolved, and straining the solution. Metal molds of the proper shape are then dipped in the solution, which is heated by a water-bath, and when cool, but still pliant, the Gelatin is removed from the molds, and may be filled with any liquid and the orifice closed with a drop of the Gelatin solution, or may be left empty (as they are now largely used) for filling with powdered substances, quinine, etc. For some purposes a small proportion—say 5 per cent.—of glycerin is added to the solution, making them more elastic. *Medicinal Pearls*, which contain ether, volatile oils, etc., are made of similar material but by different processes.

1743. Gelatin Coating.—For coating pills with Gelatin a solution may be made with Gelatin 2 parts, Gum Arabic 1 part, Water 9 parts. The Gum Arabic must first be dissolved in the Water, the Gelatin soaked with the solution, and the mixture then heated by water-bath and strained. The solution is kept heated by water-bath, and the pills, stuck on needles or pins, are dipped in the solution and revolved in the air until the coating is sufficiently firm to remove the pills from the pins. This makes a fine soluble coating for pills. Various Gelatin-coating pill machines are in use.

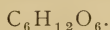
1744. Gelatin Suppositories.—For making medicated suppositories, bougies, etc., with elastic Gelatin, 3 parts of Gelatin are soaked in 2 parts of Water and then dissolved by heat and 7 parts of Glycerin added. The solution is then strained and the required medicinal substances added, thoroughly mixed, and the mixture poured into molds of suitable shape. If insoluble substances are added, the mixture must be stirred until the moment it is run into the molds, and the molds chilled with ice. Gelatin Suppositories are not so readily soluble as those made with a cacao butter base, and cannot be recommended as a good form of medication. Tannin is incompatible with Gelatin, forming an insoluble compound, therefore cannot well be used in Gelatin Suppositories.

1745. Liquid Glue.—Acids dissolve Glue, and acid solutions of Glue are used as Liquid Glue and Cement, being more convenient to apply in this form. The following formulæ may be used:

Dissolve 4 ounces of good Glue or Gelatin in a pint of Acetic Acid, by the aid of gentle heat, and add 20 drops of Nitric Acid, 5 drops Oil of Cloves, and 1 ounce Glycerin. Or

Dissolve 5 ounces of good glue in a pint of Water, by the aid of heat, and add 1 ounce of Nitric Acid.

1746. GLUCOSE AND GRAPE SUGAR.



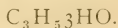
Glucose, as it is now known on the market, is a syrup prepared by the action of Sulphuric Acid on Starch, aided by heat. The process by which the purified Starch is transformed into Glucose is called *conversion*, and different grades of conversion produce quite different results. When the Glucose syrup alone is wanted the process of conversion is stopped when the Starch has disappeared, the product being a mixture of Dextrin and Glucose. This is often called *Dextrin Syrup* or *Starch Syrup*. When solid *Grape Sugar* is desired, the conversion is continued longer so as to convert the Dextrin still further into *Dextrose* or Glucose. Many large manufacturing establishments in this country are now engaged in the manufacture of Glucose and Grape Sugar, which are extensively sold as articles of food and employed by confectioners for manufacturing candy. In pharmacy, Dextrine Syrup or Glucose is employed for sweetening preparations in place of cane syrup or sugar, as it is less liable to fermentation. Grape Sugar is used as an excipient for pills, for making masses, etc., as it does not crystallize like cane sugar. *Lænulose*, *Maltose*, *Dulcictose*, *Mannitose*, and *Galactose* are other Glucoses derived from various substances.

1747.

Glucosides.

A class of *neutral principles* found in plants, which yield Glucose, $\text{C}_6\text{H}_{12}\text{O}_6$, when decomposed are called *Glucosides*. They comprise a great variety of substances, varying greatly in characteristics, some of them being the active medicinal agents of the plants from which they are derived and others being of no medicinal importance. They consist of Glucosidal resins, Glucosidal tannins, bitter principles, sweet principles, etc., some being soluble in Alcohol or ether, some in water, and some in other liquids. They are variously prepared and may be decomposed into Glucose and derivative products in several different ways, some by the action of dilute mineral acids, others by alkalies, and others by the action of ferments. A few of the more important ones, as Salicin, Santonin, etc., are official and are noted under other headings. Their names all terminate with *in*, although all principles which terminate with *in* are not Glucosides. As they are so numerous, and present such varying characteristics, they cannot well be included in a class, but are included with the other general principles of plants.

1748. GLYCERINUM — GLYCERIN.



Glycerin, as it is found in the market, is a sweet, viscid, colorless liquid, of about 125 sp. gr. and the consistence of thick syrup. It was first made known by Scheele, in 1779, and was formerly prepared as a by product of the manufacture of lead plaster and soap, being now sometimes called for as *Oil of Soap*. At present it is made commercially by distillation, the process consisting in decomposing fats by super-heated steam, under high pressure, the stearine of the fats (which is propenyl tristearate) uniting with the elements of water to form Glycerin and Stearic Acid.

Chemically, Glycerin is the hydrate of the radical *Glyceryl* or *Propenyl*, C_3H_5 , and is classed with the Alcohols, being known as *Glyceric Alcohol*, *Propenyl Alcohol*, or *Glycerol*.

Glycerin is extensively used in the arts for various purposes, and in pharmacy ranks next to Alcohol as a preservative of medicinal solutions and a solvent of medicinal agents. It is employed in making many fluid extracts, both as a preservative and a solvent; it is used as an addition to solid extracts, keeping them soft and pliable, and in making many solutions, syrups, tinctures, and like preparations. In medicine it is used to allay inflammation and irritation, both external and internal, and it is a familiar household application for chaps, sunburn, etc. It should be somewhat diluted before it is applied, because of its affinity for moisture. The dose internally is a teaspoonful or more.

1749. Nitroglycerin— $\text{C}_3\text{H}_5(\text{NO}_2)_3\text{O}_3$.—Made by mixing 1 part of Nitric Acid with 2 parts of Sulphuric Acid and adding to the mixture slowly and with constant stirring, keeping the mixture cooled artificially as low as 80°F ., one seventh of its weight of Glycerin. The mixture is then poured into a large quantity of water and the oily liquid which settles to the bottom washed with water containing an alkali.

Uses.—In mining operations Nitroglycerin is extensively used for blasting, also for "shooting" oil and gas wells. Mixed with some inert absorbing substances, which makes it safer to handle, it is known as *Dynamite*, which is much used for blasting, and in fire-works, etc.

In medicine, a 1 per cent. solution of Nitroglycerin is somewhat used for nervous disorders, in very small doses.

GLYCERITA — GLYCERITES. U. S.*Glycerina — Glycerines. Br.*

Glycerites or Glycerines are preparations in which Glycerin is used as the solvent of the medicinal agents, or the medium by which it is exhibited. Two Glycerites are official in the U. S. and eight Glycerines in the Br. Pharmacopœia. Many more are supplied under various names, as *Glycerols*, etc., by manufacturing pharmacists. The following are those official in the U. S. and Br. Pharmacopœias, most of them being intended for external application. Many of those official in the present Br. P. were official in the 1870 U. S. P., but have been deleted.

1750. Glycerinum Acidi Carbolici. Br.*Glycerine or Glycerite of Carbolic Acid.*

Carbolic Acid,	1 ounce av.
Glycerin,	4 fl.ounces.

Rub them together in a mortar until the Acid is dissolved.

1751. Glycerinum Acidi Gallici. Br.*Glycerine or Glycerite of Gallic Acid.*

Gallic Acid,	1 ounce av.
Glycerin,	4 fl.ounces.

Stir together in a porcelain dish and apply a temperature not exceeding 212° F. until complete solution is effected.

1752. Glycerinum Acidi Tannici. Br.*Glycerine or Glycerite of Tannic Acid.*

Tannic Acid,	1 ounce av.
Glycerin,	4 fl.ounces.

Stir them together in a porcelain dish and apply a temperature not exceeding that of a water-bath until complete solution is effected.

1753. Glycerinum Aluminis. Br.*Glycerine or Glycerite of Alum.*

Alum, in fine powder,	1 ounce av.
Glycerin,	5 fl.ounces.

Stir them together in a porcelain dish, gently applying heat until solution is effected. Set aside and pour off the clear fluid from any deposited matter.

1754. Glyceritum Amyli. U. S. Glycerinum Amyli. Br.*Glycerite or Glycerine of Starch.*

The U. S. formula is:

Starch,	1 part or 1 ounce av.
Glycerin,	9 parts or 9 ounces av.

Rub them together and heat to 140° C. (284° F.), stirring constantly until uniformly gelatinous.

The Br. formula is Starch 1 ounce av., Glycerin 5 fl.ounces, distilled Water 3 fl.ounces. Stir them together in a porcelain dish and apply heat, stirring constantly until the starch particles are completely broken and a translucent jelly is formed.

The U. S. preparation is of much firmer consistence than the Br.

Uses.—Glycerite of Starch is used in pharmacy as an excipient for pills and a body for suppositories, and may be used in making troches and masses. In medicine it is employed as an application to irritated surfaces, chafe, etc.

By perfuming with essential oils or bulk perfumes this makes an elegant toilet preparation, which may be sold as *Amyline*, for uses similar to Camphor Ice.

1755. Glycerinum Boracis. Br.*Glycerine or Glycerite of Borax.*

Borax, in fine powder,	1 ounce av.
Glycerin,	4 fl.ounces.
Distilled Water,	2 fl.ounces.

Rub them together in a mortar until the Borax is dissolved, or heat gently until solution is effected.

1756. Glycerinum Plumbi Subacetatis. Br.*Glycerine or Glycerite of Subacetate of Lead.*

Acetate of Lead,	5 ounces av.
Oxide of Lead, in powder,	3½ ounces av.
Glycerin,	20 fl.ounces.
Distilled Water,	12 fl.ounces.

Mix together and boil for fifteen minutes, then filter and evaporate until the Water is dissipated, which may be known when steam no longer rises.

1757. Glycerinum Tragacanthæ. Br.*Glycerine or Glycerite of Tragacanth.*

Tragacanth, in powder,	110 grains or 3 parts.
Glycerin,	1 fl.ounce or 12 fl.parts.
Distilled Water,	1¼ fl.drachm or 2 fl.parts.

Mix the Tragacanth with the Glycerin in a mortar, add the Water and rub until a translucent homogeneous jelly is produced.

1758. Glyceritum Vitelli. U. S.*Glycerite of Yolk of Egg—Glyconin.*

Fresh Yolk of Egg, by weight, 4½ ounces.

Glycerin, by weight, 5½ ounces.

Rub the Yolk of Egg with the Glycerin gradually added until they are thoroughly mixed.

This is used in pharmacy for making emulsions.

Other Glycerites.

The following Glycerites are not official in any Pharmacopœia, but some of them are considerably used.

1759. Glycerite of Albumen.

Albumen, White of Egg, 6 fl.ounces.

Glycerin, 10 fl.ounces.

Mix them thoroughly, allow to stand 24 hours and strain through a cloth strainer.

This is a bland application for chap, chafe, or any irritation of the skin. As the Glycerin is absorbed a thin coating of Albumen is left on the surface, which protects it from contact of the air.

By adding ½ ounce of any good bulk perfume to this preparation it makes an elegant toilet article.

1760. Glycerite of Arnica.

Fluid Extract of Arnica, 2 fl.ounces.

Glycerin, 6 fl.ounces.

Water, 4 fl.ounces.

Alcohol, 4 fl.ounces.

Mix the Fluid Extract, Alcohol, and Water and filter the mixture clear, then add the Glycerin.

1761. Glycerite of Bismuth.

Tris-nitrate of Bismuth, 1 ounce av.

Glycerin, 4 fl.ounces.

Dissolve the Nitrate of Bismuth in the Glycerin, without heat. It is the crystallized Nitrate of Bismuth (312), not the subnitrate, which is directed in this formula.

1762. Glycerite of Calendula.

Calendula (Marigold Flowers),	3 ounces av.
Glycerin,	8 fl.ounces.
Water, sufficient to make	1 pint.

Mix the Glycerin with 8 ounces of Water, moisten the flowers with the mixture and make a tincture by water-bath percolation, adding Water to the drug sufficient to make a pint of the percolate.

1763. Glycerite of Camphor-Chloral.

Camphor, in powder,	75 grains.
Chloral,	60 grains.
Oil of Juniper,	30 minims.
Glycerin,	4 fl.drachms.
Alcohol,	5 fl.drachms.

Mix in a bottle and heat gently, not over 104° F., until dissolved, cool, and keep well stopped.

1764. Glycerite of Carbolate of Iodine.

Carbolic Acid,	1 ounce av.
Iodine,	1 ounce av.
Alcohol,	4 fl.ounces.
Water,	5 fl.ounces.
Glycerin,	5 fl.ounces.

Dissolve the Carbolic Acid in the Glycerin and add the Water, dissolve the Iodine in the Alcohol and mix the solutions.

1765. Glycerite of Hypophosphites.

Hypophosphite of Calcium,	256 grains.
Hypophosphite of Sodium,	128 grains.
Hypophosphite of Potassium,	64 grains.
Water,	8 fl.ounces.
Glycerin,	8 fl.ounces.

Rub the Hypophosphites to a very fine powder and dissolve by rubbing in a mortar with successive portions of the mixed Glycerin and Water, previously warmed. When dissolved strain through muslin or filter. A fl.drachm represents 3½ grains of the mixed Hypophosphites. The dose is a teaspoonful to a dessertspoonful. It is considerably used in place of the Syrup of Hypophosphites.

1766. Glycerite of Iodine.*(Colorless Tincture or Solution of Iodine.)*

Tincture of Iodine,	8 fl.ounces.
Hyposulphite of Sodium,	1 ounce av.
Glycerin,	8 fl.ounces.

Rub the Sodium salt to a fine powder and then with the Glycerin until dissolved, and add the Tincture to the solution, allow to stand, and filter or decant. This is a Glycerite of Iodide of Sodium, but is more familiarly known as Colorless Tincture of Iodine.

1767. Glycerite of Pepsin.

Pepsin in scales, or <i>Pure Pepsin</i> ,	64 grains.
Concentrated Lactic Acid,	2 fl.drachms.
Water,	8 fl.ounces.
Glycerin,	8 fl.ounces.

Rub the Pepsin to a powder and then with the Water and Glycerin previously mixed, add the Lactic Acid and allow to stand a few days, with occasional agitation, then strain or filter. A fl.drachm contains $\frac{1}{2}$ grain of pure Pepsin, equivalent to 5 grains saccharated Pepsin. The dose is a teaspoonful to a dessertspoonful.

1768. Glycerite of Pepsin and Wafer Ash.

Fluid Extract of Wafer Ash (Ptelea),	1 fl.ounce.
Glycerite of Pepsin,	15 fl.ounces.

Mix them, and, after standing a few days, filter. A fl.drachm represents about $3\frac{1}{2}$ grains Wafer-Ash bark combined with Glycerite of Pepsin. The dose is a teaspoonful to a dessertspoonful.

1769. Glycerite of Phosphorus.

Phosphorus,	3 grains.
Glycerin,	1 pint.

Shave the Phosphorus under water and mix with 1 fl.ounce of the Glycerin, melt in a water-bath and shake together in a well-stopped bottle; warm the remainder of the Glycerin to about 120° F. and add to the mixture. A fl.drachm contains about $\frac{1}{80}$ grain Phosphorus.

1770. Glycerite of Quinine.

Bisulphate of Quinine,	128 grains.
Water,	8 fl.ounces.
Glycerin,	8 fl.ounces.

Mix the Water and Glycerin and dissolve the Quinine salt by rubbing in a mortar with the mixture. A fl.drachm contains 1 grain of the Quinine salt.

1771. Glycerite of Quinine and Strychnine.

Sulphate of Strychnine, 2 grains.

Glycerite of Quinine, 1 pint.

Dissolve the Strychnine salt by rubbing with the Glycerite of Quinine, or add 2 fl.drachms solution of Strychnine to a pint of the Glycerite of Quinine. A fl.drachm contains 1 grain of Quinine Bisulphate and $\frac{1}{64}$ grain Strychnine Sulphate.

Other combinations of Glycerite of Quinine with the salts of Iron, etc., may be made by adding the required salts in solution to the Glycerite of Quinine.

1772. Glycerite of Tar.

Tar, Pine or Birch, 1 ounce av.

Carbonate of Magnesium, 1 ounce av.

Glycerin, 8 fl.ounces.

Alcohol, 3 fl.ounces.

Water, 8 fl.ounces.

Rub the Carbonate of Magnesium to a fine powder and incorporate the Tar with it. Mix the Glycerin, Alcohol and Water and rub with the mixture in a mortar, then put in a quart jar, allow to stand a few days, and decant and filter the clear portion. This is given for coughs in doses of a teaspoonful to a dessertspoonful.

1773. Glycerite of Tar Compound.

Fluid Extract of Wild Cherry, $\frac{1}{2}$ fl.ounce.

Fluid Extract of Squill, 80 minims.

Glycerite of Tar, 1 pint.

Mix them and filter if necessary. The dose is a teaspoonful or more for coughs, etc.

1774. Glycerite of Yerba Santa Compound.

Fluid Extract of Yerba Santa, 2 fl.ounces.

Fluid Extract Grindelia, 1 fl.ounce.

Fluid Extract Wild Cherry, 1 fl.ounce.

Fluid Extract Liquorice, 1 fl.ounce.

Bromide of Potassium, 160 grains.

Salicylic Acid, 80 grains.

Tar, 80 grains.

Glycerin, 8 fl.ounces.

Water, 4 fl.ounces.

Carbonate of Magnesium, 1 ounce av.

Mix the Fluid Extracts and Tar and rub with the Carbonate of Magnesium in a mortar, mix the Glycerin and Water and rub with the mixture in the mortar, filter and dissolve the Bromide of Potassium and Salicylic Acid in the filtrate. The dose is a teaspoonful or more for cough, asthma, etc.

1775. GLYCYRRHIZINUM AMMONIATUM.*Ammoniated Glycyrrhizin.*

(MADE BY WATER-BATH PERCOLATION.)

Liquorice Root, in No. 20 powder,	. . . . .	16 ounces.
Water,	} each a sufficient quantity.	
Water of Ammonia,		
Sulphuric Acid,		

Mix 1 ounce of Water of Ammonia with a pint of Water and moisten the drug with 6 ounces of the mixture; pack moderately in the water-bath percolator, and having poured the remainder of the mixed Water and Ammonia upon it, cover it closely and set in a warm place for one day; then heat very moderately, and after one hour begin to percolate, adding Water to the drug and continuing the percolation and heat until two pints have passed, or until the drug is exhausted. Add to the percolate slowly (stirring at the same time) Sulphuric Acid, so long as a precipitate is produced; collect this on a strainer, wash it and redissolve in Water with the aid of Water of Ammonia, filter if necessary, and again add Sulphuric Acid so long as a precipitate is formed. Collect again on a strainer, wash with cold Water as before, and dissolve with just sufficient Water of Ammonia diluted with an equal quantity of Water. Finally, pour on plates of glass and set in a warm place to evaporate. The product is in scales. It is used chiefly in solution for masking the taste of disagreeable or bitter medicines.

HYDRARGYRUM — MERCURY.

Symbol, Hg; Atomic weight, 199.7; sp. gr., 13.59.

Mercury, or *Quicksilver*, is a fluid metal, found chiefly associated with sulphur in the form of ore, called Cinnabar, in California and other parts of the world. It is obtained by roasting the ore in kilns through which flames are made to pass, which ignite the sulphur and vaporize the Mercury, which is subsequently condensed. It congeals into a solid at -40° F.

Mercury has been known and used since the earliest history of medicine, wonderful virtues being ascribed to it by the earlier writers and practitioners. It is extensively used in mining operations to separate silver and gold from crushed quartz, sand, etc., which it does by forming an amalgam with

them. It is employed for making thermometers, barometers, and other philosophical instruments, and, with tin foil, making an AMALGAM for glass mirrors, etc. Its salts are extensively employed in the arts, in chemistry, pharmacy, and medicine. It combines with most acids, forming two classes of salts, *Mercurous* and *Mercuric*.

The following are the combinations and salts of Mercury official in the U. S., Br., and German Pharmacopœias:

1776. Hydrargyrum Ammoniatum.

Ammoniated Mercury—White Precipitate.



The U. S. P. directs 10 parts or 1 ounce av. of Corrosive Chloride of Mercury to be dissolved in 200 parts or 20 fl.ounces of warm distilled Water, and the solution to be filtered and allowed to cool. The filtrate is then carefully poured, with constant stirring, into 15 parts, or $1\frac{1}{2}$ fl.ounces of Water of Ammonia, which should be in slight excess. Then collect the precipitate, drain on a filter and wash twice with 20 parts or 2 fl.ounces of Distilled Water mixed with 1 part or 50 minims of Water of Ammonia. Finally, dry between sheets of bibulous paper at a temperature not exceeding 30°C. (86°F.). The Br. process is about the same. The salt obtained is a Chloride of Mercuric-Ammonium.

Uses.—This is used chiefly for making ointment.

1777. Hydrargyrum cum Crete.

Mercury with Chalk.

The U. S. P. directs Mercury 38 parts or 167 grains, Sugar of Milk 12 parts or 53 grains, Prepared Chalk 50 parts or 218 grains, Ether and Alcohol, each a sufficient quantity.

The Mercury, Sugar of Milk and 12 parts or 53 grains of the Chalk are put into a suitable mortar and moistened with a mixture of equal parts of Ether and Alcohol, and briskly triturated. The remainder of the Chalk is gradually added,

the powder is occasionally moistened with the Alcohol and Ether and the trituration continued until Globules of Mercury are no longer visible under a magnifying power of 10 diameters, and the powder is of a uniform gray color, and dry. The process may be hastened by using Tincture Tolu in place of Alcohol. The Br. P. directs Mercury 1 ounce by weight, and prepared Chalk 2 ounces by weight, to be rubbed together in a mortar until the Mercury is extinguished and they are uniformly mixed as above.

Uses.—This is a mild form of Mercury considerably used for children. The dose is from 3 to 10 grains.

Mercury with Magnesia is made in the same proportion and manner and is used for the same purposes.

1778. Hydrargyri Chloridum Mite.

Calomel—Mild Chloride of Mercury—Mercurous Chloride—Subchloride of Mercury.

Hg Cl.

No formula nor process of making is given in the present U. S. P., for this salt, but under the heading *Subchloride of Mercury* the Br. P. directs Persulphate of Mercury 10 ounces, Mercury 7 ounces, Chloride of Sodium 5 ounces, Boiling Distilled Water a sufficiency. The Persulphate of Mercury is to be moistened with some of the Water and rubbed with the Mercury until globules are no longer visible. The Chloride of Sodium is then to be added and thoroughly mixed by trituration. The mixture is then to be sublimed in a suitable apparatus of such size that the Calomel shall fall in a fine powder on the floor instead of adhering to the sides of the vessel. The powder is then to be washed with boiling Distilled Water, and dried at a temperature not exceeding boiling water.

Uses.—Calomel is used in making several other preparations of Mercury, and is the favorite mercurial salt for internal administration as an alterative and purgative. The dose is $\frac{1}{2}$ to 5 grains or more.

1779. Hydrargyri Chloridum Corrosivum.

Corrosive Chloride of Mercury—Corrosive Sublimate—Mercuric Chloride—Bichloride of Mercury—Perchloride of Mercury.



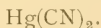
The present U. S. P. does not give the formula nor process of making this salt. The Br. P. under the name Perchloride of Mercury directs 20 ounces of Persulphate of Mercury to be mixed with 16 ounces of Chloride of Sodium and 1 ounce of Black Oxide of Manganese, and heated together in an apparatus adapted for sublimation, by which the vapors which rise are condensed.

Uses.—This salt is used for making several other preparations of mercury and in medicine as a mercuric alterative in doses of $\frac{1}{16}$ to $\frac{1}{8}$ grain. It is also extensively employed in weak solutions to destroy zymotic germs, and by surgeons to prevent poisoning during operations.

Antidote.—The best antidote for poisoning with Corrosive Sublimate is albumen (white of egg).

1780. Hydrargyri Cyanidum.

Cyanide of Mercury—Mercuric Cyanide.



No process for making this salt is given in the present U. S. P., but it may be made from the process formerly official, which is as follows:

Dissolve 5 tr.ounces of Ferrocyanide of Potassium in 20 fl.ounces of Water and add the solution to $4\frac{1}{4}$ tr.ounces of Sulphuric Acid, diluted with 10 fl.ounces of Water and contained in a glass retort. Distill the mixture nearly to dryness, conducting the vapor into a receiver containing 10 fl.ounces of Water and 3 tr.ounces of Red Oxide of Mercury. Set aside 2 fl.ounces of the distilled liquid and to the remainder add, with agitation, sufficient Red Oxide to destroy the odor of Hydrocyanic Acid, then filter the solution, and having added the reserved liquid evaporate the whole in a dark place,

in order that crystals may form, which should be kept in a well stopped bottle protected from the light.

Uses.—This salt is used as an alterative in Syphilis, in doses of $\frac{1}{16}$ to $\frac{1}{8}$ grain.

1781. Hydrargyri Iodidum Rubrum.

Red Iodide of Mercury—Biniodide of Mercury—Mercuric Iodide.



The U. S. formula is :

Corrosive Chloride of Mercury, 9 parts or 1 ounce av.

Iodide of Potassium, . . . 11 parts or 535 grains.

Distilled Water, a sufficient quantity.

Dissolve the Mercury salt in 150 parts or a pint of warm Distilled Water and the Iodide in 30 parts or 3 fl.ounces of Distilled Water and filter the solutions separately. Add the Mercury solution to the solution of Iodide of Potassium, constantly stirring. Collect the precipitate on a filter, wash it with Distilled Water until the washings cease to give a precipitate with a test solution of Nitrate of Silver, and dry it between sheets of bibulous paper at a temperature not exceeding 40°C. (140°F.), and keep in well stopped bottles. The Br. formula is similar.

Uses.—This salt is given in doses of $\frac{1}{32}$ to $\frac{1}{8}$ of a grain for syphilis, etc., and is used in making ointments, and other absorbent applications.

1782. Hydrargyri Iodidum Viride.

Green Iodide of Mercury—Protiodide of Mercury—Mercurous Iodide.



Mercury, 8 parts or 1 ounce av.

Iodine, 8 parts or 274 grains.

Alcohol, a sufficient quantity.

Pour about 3 parts or $\frac{1}{2}$ fl.ounce of Alcohol into a mortar containing the Mercury, add the Iodine in successive portions

and triturate the mixture, adding sufficient Alcohol from time to time to keep the mass constantly moist and taking care that it shall neither become too hot nor be exposed to light during the various steps of the process. Continue the trituration until all the globules of Mercury have disappeared and the mixture has become nearly dry and has acquired a greenish-yellow color. Then add sufficient Alcohol to reduce the whole to a thin paste; pour this into a bottle, let stand for several days and then wash the Iodide twice with about 50 parts or 8 fl.ounces of Alcohol each time and decant the washings. Transfer the Iodide to a filter and continue the washing with Alcohol until the washings are no longer affected by Hydrosulphuric Acid. Lastly, dry the product in a dark place, between sheets of bibulous paper, at a temperature not exceeding 40° C. (104° F.), and keep in well stopped bottles, protected from light.

Uses.—This salt is used as an alterative and absorbent; being milder than the Red Iodide, it is better adapted for internal use. Dose, 1 grain.

1783. Hydrargyri Oxidum Flavum.

Yellow Oxide of Mercury—Yellow Mercuric Oxide.

HgO.

The U. S. formula is:

Corrosive Chloride of Mercury, 1 part or 1 ounce av.

Solution of Potassa, . . . 9 parts or $8\frac{1}{2}$ fl.ounces.

Distilled Water, a sufficient quantity.

Dissolve the Mercury Salt in 100 parts or about 6 pints of warm, Distilled Water, and filter the solution; pour the filtrate into the Solution of Potassa previously diluted with 100 parts or 6 pints of Distilled Water, stirring constantly, and set aside for 24 hours; then decant the supernatant clear liquid from the precipitate, and wash the latter repeatedly with Distilled Water until the washings cease to be affected by a test solution of Nitrate of Silver. Let the precipitate drain, and dry it between sheets of bibulous paper in a dark place, at a

temperature not exceeding 40° C. (104° F.). The British formula is essentially the same, except that Solution of Soda is used.

Uses.—In pharmacy this salt is used for making Oleate of Mercury and in making ointments, etc. It is not administered internally.

1784. Hydrargyri Oxidum Rubrum.

Red Oxide of Mercury—Red Precipitate—Red Mercuric Oxide.



Although this salt is chemically the same as the preceding one, it presents an entirely different appearance. The present U. S. P. gives no formula for preparing it. The following is the formula of the Br. P.:

Mercury, by weight,	8 ounces av.
Nitric Acid,	$4\frac{1}{2}$ fl.ounces.
Water,	2 fl.ounces.

Dissolve half the Mercury in the Nitric Acid, diluted with the Water, evaporate the solution to dryness and with the dry salt thus obtained, triturate the remainder of the Mercury until the two are uniformly blended together. Heat the mixture in a porcelain dish, with repeated stirring, until acid vapors cease to be evolved.

Uses.—Red Precipitate, as it is most familiarly known, is used in pharmacy for preparing an ointment and for other purposes. It is a favorite domestic application in the form of ointment for Itch, body-vermin, etc. It is not administered internally.

1785. Hydrargyri Persulphas.

Persulphate of Mercury—Sulphate of Mercury—Mercuric Sulphate.

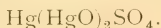


This salt is official in the Br. P., but not in the U. S. P. It is known commercially as Sulphate of Mercury, and is

considerably used in batteries for generating electricity. It is made by heating together in a porcelain vessel, with constant stirring, 10 ounces av. of Mercury and 6 fl.ounces Sulphuric Acid until they are combined, and continuing the heat until the moisture has evaporated and a dry, white salt remains. It is a white, heavy crystalline powder, and in British Pharmacy is used for making Perchloride of Mercury and Subchloride of Mercury.

1786. Hydrargyri Subsulphas Flavus.

Yellow Subsulphate of Mercury—Basic Mercuric Sulphate—Turpeth Mineral.



Mercury,	10 parts or 2 ounces av.
Sulphuric Acid,	5 parts or 1 ounce av.
Nitric Acid,	4 parts or 4½ fl.drachms.
Distilled Water, a sufficient quantity.	

Upon the Mercury contained in a capacious flask pour the Sulphuric Acid, then gradually add the Nitric Acid previously mixed, with three parts or ½ fl.ounce of Distilled Water, and digest at a gentle heat until reddish fumes are no longer given off. Transfer the mixture to a porcelain capsule and heat it on a sand-bath, frequently stirring, until a dry, white mass remains. Reduce this to a fine powder and throw it in small portions at a time, and constantly stirring into 200 parts or 2½ pints of boiling Distilled Water. When all has been added continue the boiling for 10 minutes, then allow the precipitate to settle, decant the supernatant liquid, transfer the precipitate to a strainer, wash it with warm, Distilled Water until the washings no longer have an acid reaction, and dry in a moderately warm place.

Uses.—This salt was formerly considerably used as an alterative, in doses of ¼ to ½ grain, but is now mostly replaced for internal use by milder mercurial salts.

1787. Hydrargyri Sulphidum Rubrum.

Red Sulphide of Mercury — Cinnabar — Vermilion.

HgS.

The Native Red Sulphide of Mercury is called Cinnabar, but the manufactured article is usually called Vermilion. It is extensively used as a red pigment and is made by different manufacturers of different grades of brilliancy and value, the Chinese being considered the finest. The U. S. P. of 1870 directed it to be made by melting 8 ounces of Sulphur, and gradually adding 40 ounces of Mercury, with constant stirring, continuing the heat until the mass begins to swell, then removing the vessel from the fire and covering it closely, to prevent from inflaming. When the mass is cold it is rubbed into a powder and sublimed. In medicine this is sometimes used as a fumigation, a small portion being put upon coals or a red hot shovel and the fumes inhaled.

Other Salts of Mercury.

The foregoing official Salts of Mercury embrace nearly all that are used to any extent in Pharmacy. A few other salts are sometimes employed for various purposes, and are here mentioned:

1788. Acetate of Mercury.—Made by dissolving Oxide of Mercury in Acetic Acid, concentrating and crystallizing.

1789. Arseniate of Mercury.—By adding a solution of Arsenic Acid to a solution of Nitrate of Mercury and collecting the precipitate in the usual way.

1790. Bromide of Mercury—*Mercuric Bromide*— HgBr_2 .—By dissolving Oxide of Mercury in a hot solution of Hydrobromic Acid, filtering, concentrating and crystallizing. *Mercurous Bromide*— HgBr . may be made by precipitating a solution of Mercurous Nitrate by a solution of Bromide of Potassium.

1791. Carbonate of Mercury— Hg_2CO_3 .—By precipitating a solution of Mercurous Nitrate with Acid Potassium Carbonate, and collecting the precipitate.

1792. Nitrate of Mercury— $\text{Hg}_2(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$.—By mixing 4 parts of Mercury with a mixture of 3 parts of Nitric Acid and 1 part of Water, and after 24 hours collecting the crystals.

Several other unimportant Salts of Mercury are sometimes used but so seldom as to require only mention, as *Chlorate of Mercury*, *Chromate of Mercury*, *Lactate of Mercury*, *Phosphate of Mercury*, etc.

HYDROGENUM — HYDROGEN.

Symbol, H.; Atomic Weight, 1; Sp. gr., 1.

The Element Hydrogen is a colorless, odorless, inflammable gas, the lightest of all known substances. It rarely exists in Nature in a free state, but combined with other substances from which it may be obtained by chemical action.

In chemistry it is one of the most important elements, being used as the standard of comparison for all others, its atomic weight being taken as unity. It unites with all the gaseous elements, and a few of the metals and non-metals, forming binary compounds called *Hydrides*. It is present in Water, in all true acids, and in all organic radicals. Its affinity in the molecules of substances is less than most of the metals and other basic substances, and it is therefore replaced wholly or partly in the molecules by other bases when they are brought together. It forms gaseous, binary combinations with the haloid elements, Bromine, Chlorine, Iodine and Fluorine, the solutions of which in Water are called *Hydroacids*, as Hydrobromic Acid, etc. It forms compounds with Antimony, Arsenic, Copper, Phosphorus, Sulphur, Selenium, Silicon and Tellurium. With Oxygen it forms two oxides, Water, H_2O , and Peroxide of Hydrogen, H_2O_2 , and with Nitrogen it unites to form Ammonia, H_3N . Its compounds with Carbon form an extensive series of radicals, known as *Hydrocarbons*, among which are included the Alcohol and Benzene radicals, and it is a constituent of all alkaloids and other principles of plants.

1793.—Peroxide of Hydrogen— H_2O_2 .—Made by decomposing Peroxide of Barium by Hydrochloric Acid in the presence of ice-cold Water and the precipitation of the newly formed Barium Chloride by means of Sulphate of

Silver, the Peroxide of Hydrogen remaining in solution. This compound is seldom made except in chemical laboratories. It is a wonderful bleaching agent and has been extensively employed by hair dressers for bleaching hair, making it blonde or golden. *Blondine*, a proprietary preparation for this purpose, is composed chiefly of this solution.

1794. Hydracids.—The inorganic acids which are formed by the combination of Hydrogen with non-metallic elements, and do not contain Oxygen, are known as *Hydracids*. They are Hydrobromic Acid, Hydrochloric Acid, Hydrofluoric Acid, Hydriodic Acid, Hydrosulphuric Acid, and Hydrocyanic Acid.

INFUSA — INFUSIONS.

Infusions are preparations in which the medicinal strength of the drug is obtained by infusing or steeping it in hot Water without boiling. They were formerly much used, but on account of the superior convenience and greater reliability of fluid extracts and other modern galenicals are now but little employed except by the “old-time” physicians. The present U. S. P. contains but 5 of the 31 infusions that were formerly official. The Br. P. contains 28.

As infusions (with the exception of Infusion Digitalis) contain no Alcohol or other preservative, they will keep only for a short time, and must be freshly made when wanted.

It has become the custom in this country, when infusions are wanted for prescriptions, to mix the fluid extract of the drug directed, an equivalent quantity, with the Water directed to be used. This practice, although very convenient, is not to be commended.

The following are the infusions official in the U. S. P.:

1795. General Formula for Infusions.

The U. S. P. gives a general formula for infusions not specified in the Pharmacopœia, from which they may be prepared as follows:

The substance coarsely	}	10 parts or 1 ounce av.
comminuted,		
Boiling Water,		100 parts or 10 fl.ounces.
Water, a sufficient quantity.		

Put the substance into a suitable vessel provided with a cover, pour upon it the boiling Water, cover the vessel tightly and let it stand for two hours. Then strain, and pass enough Water through the strainer to make the infusion weigh 100 parts or measure 10 fl.ounces.

BY WATER-BATH PERCOLATION.

It is evident from the nature of Infusions that the water-bath percolator is the most convenient vessel in which to make them.

This formula may be used for making all Infusions which may be prescribed or directed, except those for which formulæ are given:

The substance, coarsely ground, 1 part or ounce.
Water, sufficient to make . . . 10 parts or ounces.

Having adjusted the perforated diaphragm or strainer in the bottom of a small-sized water-bath percolator, put the substance in the percolator and pour the water upon it. Cover the percolator closely with the cover, and having filled the vessel surrounding the percolator two-thirds full of Water, heat to boiling, continue the heat moderately for half an hour and draw off the liquid by the stop-cock, adding enough Water through the percolator to make 10 parts of the preparation.

1796. *Infusum Brayeræ.*

Infusion of Brayera (Kousso).

Brayera, in No. 20 powder, 6 parts or 1 ounce av.
Boiling Water, . . . 100 parts or 1 pint.

Pour the boiling Water upon the Brayera and let it macerate in a covered vessel until cool.

This is to be dispensed, powder and all, in doses of from 4 to 8 fl.ounces.

1797. Infusum Cinchonæ.*Infusion of Cinchona.*

Cinchona, in No. 40 powder, 6 parts or 1 ounce av.

Aromatic Sulphuric Acid, 1 part or 75 minims.

Water, to make . . . 100 parts or 1 pint.

Mix the Acid with 50 parts of Water and moisten the powder with 3 parts of the mixture; pack it firmly in a conical glass percolator and gradually pour upon it, first, the remainder of the mixture, and afterward, Water until the Infusion weighs 100 parts or measures a pint. The dose is a tablespoonful.

1798. Infusum Digitalis.*Infusion of Digitalis.*

Digitalis, 3 parts or $\frac{1}{4}$ ounce av.

Cinnamon, 3 parts or $\frac{1}{4}$ ounce av.

Boiling Water, 185 parts or 1 pint.

Alcohol, 15 parts or 1 $\frac{1}{2}$ fl.ounce.

Pour the Boiling Water upon the mixed powders and macerate for two hours in a covered vessel. Then strain, add the Alcohol, and pass enough Water through the strainer to make the Infusion weigh 200 parts or measure 1 pint. The dose is a teaspoonful or two.

1799. Infusum Pruni Virginianæ.*Infusion of Wild Cherry.*

Wild Cherry, in No. 40 powder, . . . 307 grains.

Water, sufficient to make a pint.

Moisten the powder with 6 fl.drachms of Water and macerate for one hour; then pack firmly in a conical glass percolator, and gradually pour Water upon it until a pint of the Infusion is obtained.

This Infusion is made with cold Water because the heat of boiling Water volatilizes the Hydrocyanic Acid, to which its flavor and value is due. The dose is 1 to 2 fl.ounces.

1800. Infusum Sennæ Compositum.*Compound Infusion of Sennæ—Black Draught.*

Senna,	6 parts or 1	ounce av.
Manna,	12 parts or 2	ounces av.
Sulphate of Magnesium,	12 parts or 2	ounces av.
Fennel, bruised,	2 parts or $\frac{1}{3}$	ounce av.
Boiling Water,	100 parts or 1	pint.
Water, a sufficient quantity.		

Pour the boiling Water upon the solid ingredients and macerate in a covered vessel until cold. Then strain and add enough Water through the strainer to make the Infusion weigh 100 parts.

The Compound Infusion of Senna, Black Draught, or *Vienna Draught* (Wiener Trank) of the German Pharmacopœia is as follows: Senna, cut, 5 parts, boiling Water 30 parts. Heat them by means of a steam-bath for five minutes, when cold, strain and dissolve in the infusion Tartrate of Potassium and Sodium 5 parts, Manna 5 parts. The dose of Infusion of Senna Compound, as a laxative is from 1 to 2 fl.ounces, as a brisk purgative 4 to 6 fl.ounces.

Other Infusions.

The following are the official Infusions of the 1885 Br. P. Most of these were formerly official in the U. S. P. The dose of all the following, unless otherwise noted, is from 1 to 2 fl.ounces:

1801. Infusum Anthemidis—*Infusion of Chamomile.*—Chamomile Flowers $\frac{1}{2}$ ounce, boiling Distilled Water 10 fl.ounces. Infuse for 15 minutes in a covered vessel and strain.

1802. Infusum Aurantii—*Infusion of Orange Peel.*—Bitter Orange Peel cut small $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse for 15 minutes in a covered vessel and strain.

1803. Infusum Aurantii Compositum—*Compound Infusion of Orange Peel.*—Bitter Orange Peel cut small $\frac{1}{4}$ ounce, Fresh Lemon Peel cut small, 56 grains, Cloves bruised 28 grains, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for 15 minutes and strain.

1804. Infusum Buchu—*Infusion of Buchu*.—Buchu Leaves, bruised $\frac{1}{2}$ ounce, boiling, distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1805. Infusum Calumbæ—*Infusion of Calumba*.—Calumba Root cut small $\frac{1}{2}$ ounce, cold distilled Water 10 fl.ounces. Macerate in a covered vessel (without heat) for half an hour and strain.

1806. Infusum Caryophylli—*Infusion of Cloves*.—Cloves bruised $\frac{1}{4}$ ounce, boiling distilled Water, 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1807. Infusum Cascarillæ—*Infusion of Cascarilla*.—Cascarilla Bark in No. 20 powder 1 ounce, boiling distilled Water 10 fl.ounces. Infuse for half an hour in a covered vessel and strain.

1808. Infusum Catechu—*Infusion of Catechu*.—Catechu in coarse powder 160 grains, Cinnamon Bark bruised 30 grains, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1809. Infusum Chirataë—*Infusion of Chiretta*.—Chiretta, cut small $\frac{1}{4}$ ounce, distilled Water at 120° F. 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1810. Infusum Cinchonæ Acidum—*Acid Infusion of Cinchona*.—Red Cinchona Bark in No. 40 powder $\frac{1}{2}$ ounce, Aromatic Sulphuric Acid 1 fl.drachm, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for one hour and strain. This is similar to the U. S. Infusion of Chinchona.

1811. Infusum Cuspariæ—*Infusion of Cusparia*.—Cusparia Bark in No. 40 powder $\frac{1}{2}$ ounce, distilled Water at 120° F. 10 fl.ounces. Infuse in a covered vessel for one hour and strain.

1812. Infusum Cusso—*Infusion of Kousso*.—Kousso in coarse powder $\frac{1}{2}$ ounce, boiling distilled Water 8 fl.ounces. Infuse in a covered vessel for 15 minutes. Not to be strained. Dose 4 to 8 fl.ounces. This is similar to the U. S. Infusion of Kousso.

1813. Infusum Digitalis—*Infusion of Digitalis*.—Foxglove Leaves, dried 28 grains, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for 15 minutes and strain. Dose, 2 to 4 fl.drachms. This is only about half the strength of the U. S. Infusion of Digitalis.

1814. Infusum Ergotæ—*Infusion of Ergot*.—Ergot crushed $\frac{1}{4}$ ounce, boiling, distilled Water, 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1815. Infusum Gentianæ Compositum—*Compound Infusum of Gentian*.—Gentian Root, sliced, Bitter Orange Peel cut small, of each, 55 grains, Fresh Lemon Peel, cut small $\frac{1}{4}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

The U. S. 1870 Compound Infusion of Gentian, which is still considerably used, was Gentian $\frac{1}{2}$ tr.ounce, Bitter Orange Peel, Coriander Seed, each 60

grains, Alcohol 2 fl.ounces, Water sufficient to make a pint. The Alcohol was mixed with 14 fl.ounces of Water and the drugs percolated with the mixture.

1816. Infusum Jaborandi—*Infusion of Jaborandi*.—Jaborandi, cut small $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour and strain.

1817. Infusum Krameriae—*Infusion of Rhatany*.—Rhatany Root $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1818. Infusum Lini—*Infusion of Linseed*.—Linseed 150 grains, Dried Liquorice Root, in No. 20 powder 50 grains, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for two hours, and strain.

1819. Infusum Lupuli—*Infusion of Hop*.—Hop $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for one hour, and strain.

1820. Infusum Maticæ—*Infusion of Matico*.—Matico Leaves, cut small $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1821. Infusum Quassiae—*Infusion of Quassia*.—Quassia Wood, in chips 55 grains, cold distilled Water 10 fl.ounces. Macerate in a covered vessel (without heat), for half an hour, and strain.

1822. Infusum Rhei—*Infusion of Rhubarb*.—Rhubarb Root, in thin slices $\frac{1}{4}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1823. Infusum Rosæ Acidum—*Acid Infusion of Roses*.—Dried Red Rose Petals, broken up, $\frac{1}{4}$ ounce, Diluted Sulphuric Acid 1 fl.drachm, boiling distilled Water 10 fl.ounces. Add the Acid to the Water, infuse the petals in the mixture in a covered vessel for half an hour, and strain.

1824. Infusum Senagæ—*Infusion of Senega*.—Senega Root in No. 20 powder $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1825. Infusum Sennæ—*Infusion of Senna*.—Senna 1 ounce, Ginger, sliced 28 grains, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1826. Infusum Serpentariæ—*Infusion of Serpentry*.—Serpentry Root in No. 20 powder $\frac{1}{4}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for half an hour, and strain.

1827. Infusum Uvæ Ursi—*Infusion of Bearberry*.—Uva Ursi Leaves, bruised $\frac{1}{2}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for one hour, and strain.

1828. Infusum Valerianæ — *Infusion of Valerian*.—Valerian Rhizome, bruised $\frac{1}{4}$ ounce, boiling distilled Water 10 fl.ounces. Infuse in a covered vessel for one hour, and strain.

The foregoing Infusions include all that are at present official in the U. S., Br. and G. Pharmacopœias, and all for which there is generally a demand; if others are desired, they may be made by the general directions in the beginning of this article.

1829. IODOFORMUM — IODOFORM.



To prepare Iodoform, Felhol's process is usually chosen as being most economical. Two parts of Crystallized Carbonate of Sodium are dissolved in 10 parts of Water and 1 part of Alcohol, by the aid of gentle heat, 1 part of Iodine is then added to the solution in small portions, and after cooling the crystals are collected, and the solution or mother liquor filtered. This is warmed, 2 parts of Carbonate of Sodium are again added, and a current of Chlorine passed rapidly through the mixture as long as Iodoform is separated. The crystals are then washed with a little cold Water and carefully dried.

Iodoform is insoluble in Water, but soluble in Alcohol, Ether, Chloroform, etc. It has a peculiar, disagreeable odor, which makes it objectionable in medicines, but this is in a measure overcome by the addition of Oil of Peppermint or other strongly flavored oils.

Caff-Iodoform is a mixture of finely powdered Coffee with Iodoform, intended to overcome its disagreeable odor, which it does imperfectly.

Uses.—Iodoform is given internally as an alterative, in doses of 1 to 3 grains, but is chiefly used in the form of ointment, in suppositories, and as a dusting to sores, ulcers, syphilitic growths and diseased surfaces. It is also used as a surgical dressing in the form of *Iodoform Cotton*, which is made by dissolving 24 grains of Iodoform in a mixture of 4 fl.drachms of Alcohol with 2 fl.drachms of Ether, and adding 2 fl.drachms of Glycerin, saturating 360 grains of Purified Cotton with the liquid, and drying by exposure to the air.

IODUM — IODINE.

Symbol, I; Atomic Weight, 126.6; Sp. gr., 4.95.

Iodine is a non-metallic element, first discovered by De Courtois, in 1812, examined and described in 1813, by M. Clement, and assigned a place as an element soon afterward by Sir H. Davy and M. Gay Lussac.

It is chiefly obtained from Kelp, the ashes of sea-weeds, obtained off the coast of Scotland, by percolating them with Water, filtering the percolate, concentrating it by evaporation to a small volume, removing the crystalline salts as they form in the liquid during evaporation, and adding finally to the dark-brown liquid residue, which is called *Iodine Lye*, Sulphuric Acid in excess. After standing, the liquid is decanted, heated to about 140° F., and mixed with Binoxide of Manganese, as much as was used of Acid. The whole is then introduced into a cylindrical leaden still, heat is applied and the vapor of Iodine which rises is condensed in glass receivers. It is then "resublimed," and in this form is furnished to the trade.

Iodine, Bromine, Chlorine and Fluorine are classed in chemistry as *hologens* (salt-producers). Their characteristics and properties are similar.

Iodine unites with the most of the metallic bases, forming a class of salts called *Iodides*; with Hydrogen it forms *Hydriodic Acid*, which also combines with bases to form Iodides, the Hydrogen being displaced. With Oxygen it forms *iodic* and *periodic anhydrides*, which unite with bases in the presence of Water, forming *iodates*.

In pharmacy Iodine is used in the form of tincture, solutions and ointments, and for making Hydriodic Acid, Iodoform and many well-known salts, etc. Medicinally, it is seldom used except in solution or admixture with other substances. The combinations of Iodine with bases are noticed under the basic substances. The following are the combinations of Iodine with Hydrogen and Oxygen, called Acids:

Acids of Iodine.

1830. Hydriodic Acid—HI.—A solution of this gas in Water is made by passing a current of Hydrosulphuric Acid gas through a solution of Iodine

until it acquires a pure yellowish color, and ceases to turn brown on shaking. This solution was formerly made by the U. S. process to contain 15 per cent. of real Hydriodic Acid, but is not now official. The Syrup of Hydriodic Acid, which is the only official preparation, contains 1 per cent. of the real Acid.

1831. Iodic Acid or Anhydride— HIO_3 .—This is made by heating 1 part of Iodine with 10 parts of Nitric Acid in a retort until the Iodine is dissolved and fumes cease to be evolved. The solution is then evaporated and the residue heated to 200°F . until all traces of acid are removed. The white powder is Iodic Anhydride.

1832. Periodic Acid or Anhydride— HIO_4 .—By adding 1 part of Iodine to 7 parts of Carbonate of Sodium dissolved in 100 parts of Water, and passing Chlorine into the heated liquid until a precipitate ceases to form. Collect this precipitate, dissolve it in pure Nitric Acid then add Nitrate of Silver, and dissolve the precipitate which forms in hot, diluted Nitric Acid. Concentrate the solution and crystallize, then re-dissolve the crystals in Water and re-crystallize.

LAC — MILK.

Milk obtained from the mammary glands of the cow, goat, or mare is the source of many important articles employed in pharmacy and medicine. It consists of about 85 per cent. of water and 15 per cent. of solid constituents, the most important of which are *butter* (327), *casein*, of which cheese is made, and *milk-sugar*. The following are the preparations used in pharmacy which are derived from milk:

1833. Condensed Milk.—Made by evaporating Milk *in vacuo* at a low temperature until most of its water has been vaporized and it is reduced to the consistence of an extract. It is only made by large manufacturing establishments, and is usually put up in sealed cans. It may be used advantageously for making emulsions.

1834. Koumiss.—This is milk prepared as a beverage or nutritive drink for invalids. It was first introduced by the Russians, who made it by fermenting mare's milk, but is now made quite extensively in this country from cow's milk, by adding to one gallon of skimmed sweet Milk 4 ounces of white Sugar and a cake of Vienna Yeast. This is allowed to stand in a warm place for a few hours and is then transferred to pint or quart bottles, which are tightly stopped and set in a warm place for a few hours to ferment and then put on their sides in a cool cellar. In about three days it is ready for use. Koumiss does not keep a great while, and when opened, like champagne, loses its gas and becomes worthless. Small quantities, as wanted for use, may be drawn from the bottles by a champagne tap.

1835. Saccharum Lactis—*Sugar of Milk*— $C_{12}H_{22}O_{11} \cdot H_2O$.—When the Casein and albuminous matter has been separated from Milk, as in the process of making cheese, there remains a liquid called *whey*, which contains Milk-Sugar in solution. This may be obtained by evaporating the whey, purifying the syrup obtained, and allowing the Milk-Sugar to crystallize. The best Sugar of Milk is obtained from goat's milk, but cow's milk yields a good quality when properly treated.

Uses.—Milk-Sugar is used in pharmacy as a dilutant to powerful alkalis and other medicines which are triturated with it to a very fine powder. It is used in making abstracts, powdered extracts, triturations, saccharated pepsin, and many other similar preparations. It is much harder and less soluble than other sugars.

1836. Acidum Lacticum—*Lactic Acid*— $HC_3H_5O_3$.—By standing, Milk becomes sour, or, rather, its milk-sugar is converted by oxidation into *Lactic Acid*, which may be obtained from it by various processes. It is made, however, by manufacturing chemists from cane sugar by treating it with sulphuric acid until "inverted," then adding caustic soda and heating the mixture until it ceases to precipitate Fehling's solution, showing the absence of sugar. To this, sulphuric acid is then added, which forms sodium sulphate, which crystallizes out. The liquid is then mixed with alcohol, allowed to precipitate, and one half the alcoholic solution heated with carbonate of zinc until effervescence ceases; the other half is then added, and, when cool, zinc Lactate crystallizes out, which, when treated with hydrosulphuric acid, yields sulphide of zinc in crystals, Lactic Acid remaining in solution.

Uses.—The salts of Lactic Acid, with bases, are called *Lactates*, for making which it is chiefly employed. It is also used in making some solutions, syrups, elixirs, etc., and in medicine to aid digestion, etc. (See 36.)

LAMELLÆ — DISCS.

The 1885 Br. P. introduces, under this name, the following preparations:

1837. Lamellæ Atropinæ—*Discs of Atropine*.—Discs of Gelatine with some Glycerin, each weighing about $\frac{1}{30}$ grain and containing $\frac{1}{3000}$ grain of Sulphate of Atropine.

1838. Lamellæ Cocoainæ—*Discs of Cocaine*.—Discs of Gelatine with some Glycerin, each weighing about $\frac{1}{30}$ grain and containing $\frac{1}{2000}$ grain of Hydrochlorate of Cocaine.

1839. Lamellæ Physostigminæ—*Discs of Physostigmine*.—Discs of Gelatine, with some Glycerin, each weighing about $\frac{1}{30}$ grain, and containing $\frac{1}{10000}$ grain of Physostigmine.

LINIMENTA — LINIMENTS.

Liniments in pharmacy are solutions or liquid mixtures intended for external application, and generally applied by rubbing on the skin with friction, for reducing swellings, relieving pain, etc. A great number of proprietary liniments are also recommended for internal use as well as application. Under this heading only, the liniments which are official in the U. S., Br. or German Pharmacopœias will be noticed. Those popular as proprietary remedies will be found under *The Standard Remedies*, etc.

The following are the formulæ for liniments official in the U. S., Br. and German Pharmacopœias:

1840. Linimentum Aconiti—*Aconite Liniment*.—Aconite Root in No. 40 powder 20 ounces av., Camphor 1 ounce av., Rectified Spirit, a sufficient quantity to make 30 fl.ounces (Imperial measure). Mix the Aconite with 20 fl.ounces of the spirit and macerate in a closed vessel for three days, agitating occasionally; then transfer to a percolator, and when the liquor ceases to pass continue the percolation with more of the spirit, allowing the liquor to drop into a receiver containing the Camphor, until the product measures the quantity above stated. Br.

1841. Linimentum Ammoniaë—*Ammonia Liniment*.—The U. S. P. directs Water of Ammonia 30 parts or 3 ounces av. Cotton Seed Oil 70 parts or 7 ounces av., to be mixed together with violent agitation.

The Br. P. directs 1 part or fl.ounce of Solution (Water) of Ammonia to be mixed with 3 parts or fl.ounces of Olive Oil.

The G. P. directs 3 parts Olive Oil, 1 part Poppy Oil and 1 part Water of Ammonia.

The French Codex directs 90 parts Almond Oil to 10 parts of 4 F. Water Ammonia.

The U. S. preparation has been found defective, as it will not remain mixed without separating.

The Br. formula makes a preparation which solidifies or becomes too thick upon standing for some time.

The German contains too much oil for the Ammonia.

By mixing half Olive Oil with the Cotton Seed Oil, in the U. S. formula, or by substituting Oil of Benne altogether for the Cotton Seed Oil, a stable and unobjectionable Liniment is produced.

This Liniment is popularly known as *Volatile Liniment*.

1842. Linimentum Belladonnæ—*Belladonna Liniment*.—The U. S. formula is, Fluid Extract of Belladonna (root) 95 parts or 9½ fl.ounces

Camphor 5 parts or $\frac{1}{2}$ ounce av. Dissolve the Camphor in the Fluid Extract.

The Br. P. directs a strong tincture of Belladonna Root to be made in the same manner and in the same proportion as is directed for making *Linimentum Aconiti*, and Camphor 1 ounce av. to be dissolved in the tincture thus prepared to make 30 fl.ounces (Imperial measure).

1843. *Linimentum Calcis* — *Lime Liniment*.—Solution of Lime 1 part or 2 fl.ounces, Cotton Seed Oil or Olive Oil 1 part or 2 fl.ounces. Mix them by agitation. The U. S. P. directs Cotton Seed Oil, the Br. P. Olive Oil. The 1870 U. S. P. directed equal parts of Lime Water and Flax Seed Oil, which formula is still followed by most druggists. As thus prepared it was popularly known as *Carron Oil*, deriving its name from the Carron Iron Works, Scotland, where it was extensively used for burns.

1844. *Linimentum Camphoræ* — *Camphor Liniment*, *Camphorated Oil*.—The U. S. formula is, Camphor 20 parts or 3 ounces av., Cotton Seed Oil 80 parts or 12 ounces av. The Camphor is to be dissolved in the Oil. The Br. P. directs Olive Oil in the same proportion in place of the Cotton Seed Oil. The G. P., under the name *Oleum Camphoratum*, directs 1 part of Camphor to be dissolved in 9 parts of Olive Oil, making a preparation only about two thirds the strength of Camphor as the U. S. or Br.

1845. *Linimentum Camphoræ Compositum* — *Compound Camphor Liniment*.—Br. Camphor $2\frac{1}{2}$ ounces av., Oil of Lavender 1 fl.drachm, strong solution of Ammonia 5 fl.ounces (Imperial measure), Rectified Spirit 15 fl.ounces (Imperial measure). Dissolve the Camphor and Oil of Lavender in the Spirit, then add the solution of Ammonia, gradually shaking them together until a clear solution is formed.

1846. *Linimentum Camphoræ Ammoniatum* — *Ammoniated Camphor Liniment*.—The G. P. directs Camphorated Oil (see G. P. formula above) 3 parts, Poppy Oil 1 part, Water of Ammonia 1 part. Mix them to a uniform Liniment by shaking.

1847. *Linimentum Cantharidis* — *Cantharides Liniment*.—The U. S. formula is Cantharides in No. 60 powder 15 parts or 2 ounces av., Oil of Turpentine sufficient to make 100 parts or a pint. Digest the Cantharides with 100 parts or 1 pint Oil of Turpentine in a closed vessel, by means of a water-bath, for three hours; then strain and add enough Oil of Turpentine through the strainer to make 100 parts or 1 pint.

1848. *Linimentum Chloroformi* — *Chloroform Liniment*.—The U. S. formula is commercial Chloroform 40 parts or 2 fl.ounces, Soap Liniment 60 parts or $5\frac{1}{2}$ fl.ounces. Mix them.

The Br. P. directs Chloroform 2 fl.ounces, Liniment of Camphor 2 fl.ounces.

1849. *Linimentum Crotonis* — *Liniment of Croton Oil*.—This is official in the Br. P., the formula being Croton Oil 1 fl.ounce, Oil of Cajuput $3\frac{1}{2}$ fl.ounces, Rectified Spirit $3\frac{1}{2}$ fl.ounces.

1850. Linimentum Hydrargyri—*Liniment of Mercury*.—This is official in the Br. P., as follows: Ointment of Mercury 1 ounce, Solution (Water) of Ammonia 1 fl.ounce, Liniment of Camphor 1 fl.ounce. Mix the Solution of Ammonia with one half the Liniment of Camphor, rub the Mercurial Ointment with the other half, and mix them together.

1851. Linimentum Iodi—*Liniment of Iodine*.—This is rather a solution than a liniment. It is official only in the Br. P. Iodine $1\frac{1}{4}$ ounce av., Iodide of Potassium $\frac{1}{2}$ ounce av., Glycerin $\frac{1}{4}$ ounce av., Rectified Spirit 10 fl.ounces. Dissolve the Iodine, Iodide of Potassium, and Glycerin in the Spirit.

1852. Linimentum Opii—*Liniment of Opium*.—This is official in the Br. P., being simply a mixture of equal parts by measure of Tincture of Opium and Soap Liniment.

1853. Linimentum Plumbi Subacetatis—*Liniment of Subacetate of Lead*.—The U. S. P. directs this to be made with Solution Subacetate of Lead 40 parts or 2 ounces av., Cotton Seed Oil 60 parts or 3 ounces av., by mixing them well together.

1854. Linimentum Potassii Iodidi cum Sapone—*Liniment of Iodide of Potassium and Soap*.—The Br. P. formula is as follows: Curd Soap cut small 2 ounces av., Iodide of Potassium $1\frac{1}{2}$ ounce av., Glycerin 1 fl.ounce, Oil of Lemon 1 fl.drachm, distilled Water 10 fl.ounces. Dissolve the Soap in the Water and Glycerin by the aid of heat, add the Iodide of Potassium in fine powder and stir while cooling, then rub the Oil of Lemon into the cream-like product.

1855. Linimentum Saponis—*Soap Liniment, Liquid Opodeldoc*.—The U. S. formula is soap, in shavings 10 parts or 480 grains, Camphor 5 parts or 240 grains, Oil Rosemary 1 part or 48 grains, Alcohol 70 parts or 9 fl.ounces, Water q. s. to make 100 parts or $1\frac{1}{2}$ fl.ounces. The soap is digested in the Water until dissolved. The Camphor and oil are dissolved in the Alcohol; the solutions are then mixed and filtered. The Br. formula is about the same. In our experience, however, we find that a larger proportion of Water is advantageous, and so give the following:

Improved Formula—White Castile Soap, dry $4\frac{1}{4}$ ounces av., Camphor $2\frac{1}{4}$ ounces av., Oil Rosemary $\frac{1}{2}$ fl.ounce, Alcohol 32 fl.ounces, Water 8 fl.ounces. Digest the soap in the Water on a water-bath until dissolved; dissolve the Camphor and oil in the Alcohol, then mix the solutions and filter.

1856. Linimentum Sinapis Compositum—*Compound Mustard Liniment*.—The U. S. formula is, Volatile Oil of Mustard 3 parts or 1 fl.drachm, Extract of Mezereum 2 parts or 40 grains, Camphor 6 parts or 120 grains, Castor Oil 15 parts or 6 fl.drachms, Alcohol, sufficient to make 100 parts or $5\frac{1}{2}$ fl.ounces. Dissolve the extract in 70 parts or 4 fl.ounces of Alcohol, then add the Oil of Mustard and the Castor Oil, and, finally, enough Alcohol to make 100 parts or $5\frac{1}{2}$ fl.ounces. The Br. formula is about the same.

1857. Linimentum Terebinthinæ — Turpentine Liniment.—The U. S. formula is Resin Cerate 65 parts or 13 ounces av., Oil of Turpentine 35 parts or 8 fl.ounces. Melt the Cerate and add the Oil of Turpentine, mixing them thoroughly.

The Br. P. directs Soft Soap 2 ounces av., distilled Water 2 fl.ounces, Camphor 1 ounce av., Oil of Turpentine 16 fl.ounces. Mix the Soap with the Water, dissolve the Camphor in the oil, then rub the fluids together until they are thoroughly mixed.

The G. P. gives the following: Carbonate of Potassium 6 parts, Soft Soap 54 parts, Oil of Turpentine 40 parts. Mix them.

1858. Linimentum Terebinthinæ Aceticum — Liniment of Turpentine and Acetic Acid.—Oil of Turpentine 4 fl.ounces, Glacial Acetic Acid 1 ounce av., Liniment of Camphor, 4 fl.ounces. Mix them. Br.

Other Liniments.

Other liniments will be found under other headings, as Proprietary Medicines, Standard Remedies, etc.

LIQUORES — SOLUTIONS.

Under this general classification, a great variety of liquid preparations, widely dissimilar in methods of making, characteristics, properties, and strength are included.

The *Liquores* of the U. S. P. are chiefly aqueous solutions of Chemical Salts.

The Br. P. includes solutions of the gases, ammonia and chlorine, several solutions of salts charged with carbonic acid gas, and some preparations made with alcoholic or other mediums, and the name "solutions" as popularly understood includes preparations in nearly all classes of liquid galenicals.

In this department the solutions official in the U. S., Br., and German Pharmacopœias are first given; then the solutions convenient for use in making elixirs, syrups and other similar preparations; then the test-solutions and such unofficial solutions as are frequently called for. Many other solutions are also included under other headings, as ACIDS, COLORING SUBSTANCES, DIALYSATES, GLYCERITES, etc., etc.

The following are the official solutions of the U. S., Br. and German Pharmacopœias. They are given less prominence than the solutions which are employed for combining with elixirs, syrups, etc. :

1859. **Liquor Acidi Arseniosi.**

Solution of Arsenious Acid — Solution Chloride of Arsenic.

The U. S. P. directs :

Arsenious Acid in small pieces,	1 part or 74 grains.
Hydrochloric Acid,	2 parts or 135 minims.
Distilled Water sufficient to make	100 parts or 1 pint.

Boil the Arsenious Acid with the Hydrochloric Acid mixed with 25 parts or 4 fl.ounces of Distilled Water, until it is dissolved. Filter the solution and pass enough Distilled Water through the filter to make 100 parts or one pint.

The Br. formula, under the name *Liquor Arsenici Hydrochloricus*, is Arsenious Acid in powder 87 grains, Hydrochloric Acid 2 fl.drachms, Distilled Water a sufficiency to make 20 fl.ounces (Imperial).

Uses.— This solution is used as an alterative, the same as Fowler's Solution, in doses of 2 to 5 minims.

1860. **Liquor Acidi Chromici. Br.**

Solution of Chromic Acid.

The Br. P. gives the following formula :

Chromic Acid,	1 ounce av.
Distilled Water,	3 fl.ounces.

Dissolve. This solution is used as an escharotic and caustic.

1861. **Liquor Aluminii Acetici. G. P.**

Solution of Acetate of Aluminium.

Sulphate of Aluminium,	300 parts.
Acetic Acid,	360 parts.
Precipitated Carbonate of Calcium,	130 parts.
Water,	1000 parts.

Dissolve the Sulphate of Aluminium in 800 parts of Water, add the Acetic Acid and having triturated the Precipitated Carbonate of Calcium with 200 parts of Water, add it gradually to the solution, stirring constantly. Let the mixture stand 24 hours at the ordinary temperature, stirring frequently ; then strain the liquid from the sediment, press the latter without washing it and filter the liquid.

1862. Liquor Ammoniaë. Br.*Solution of Ammonia.*

The 10 per cent. solution of Ammonia Gas, NH_3 , which is known in the U. S. as Water of Ammonia. In the G. P. is called *Liquor Ammonii Caustici*. See Aqua Ammonia (145).

1863. Liquor Ammoniaë Fortior. Br.*Strong Solution of Ammonia.*

This official of the Br. P. is a 32.5 per cent. solution of Ammonia Gas in Water; the U. S. stronger Water of Ammonia being a 28 per cent. solution. See Aqua Ammonia Fortior (146).

1864. Liquor Ammonii Acetatis.*Solution of Acetate of Ammonium.—Spirit of Mindereras.*

The U. S. process for making this solution is to neutralize any convenient quantity of Diluted Acetic Acid with Carbonate of Ammonium, by adding the salt to the Dilute Acid as long as effervescence occurs. As Carbonate of Ammonium contains a variable quantity of Ammonia Gas, definite proportions cannot well be given; but in general 1 ounce av. of Carbonate of Ammonium, if fresh, will neutralize about a pint of Dilute Acetic Acid.

The Br. P. directs this solution to be made by mixing 4 fl.ounces of the strong solution of Acetate of Ammonium (1865) with 16 fl.ounces of Distilled Water.

The G. P. directs it to be made by neutralizing Water of Ammonia 10 parts with Acetic Acid 12 parts, or sufficient, and heating to evaporate excess of Ammonia.

Uses.—This solution is used as a diaphoretic or diuretic in doses of 4 to 6 fl.drachms.

1865. Liquor Ammonii Acetatis Fortior. Br.*Strong Solution of Acetate of Ammonium.*

Carbonate of Ammonium,	5 ounces av.
Acetic Acid, a sufficiency, or	13 fl.ounces.
Distilled Water, sufficient to make	16 fl.ounces.

Crush the Carb. Ammonium and add it gradually to 12 ounces of the Acetic Acid, then add more of the acid until a neutral solution results. To this add sufficient water to make 16 fl.ounces.

Uses.—This is a convenient solution to keep on hand for preparing the ordinary solution of Acetate of Ammonia. It is five times as strong as the foregoing. The dose is $\frac{1}{2}$ to $1\frac{1}{2}$ drachm.

1866. Liquor Ammonii Anisatus. G. P.*Anisated Spirit of Ammonia.*

Oil of Anise,	1 part.
Alcohol,	24 parts.
Solution (Water) of Ammonia,	5 parts.

Mix the Oil of Anise with the Alcohol and dissolve, then add the Water of Ammonia.

1867. Liquor Ammonii Citratis. Br.*Solution of Citrate of Ammonium.*

Strong Solution Citrate of Ammonium,	5 fl.ounces.
Distilled Water,	15 fl.ounces.

Mix them. The dose is 2 to 6 fl.drachms.

1868. Liquor Ammonii Citratis Fortior. Br.*Strong Solution of Citrate of Ammonium.*

Citric Acid,	12 ounces av.
Strong Solution of Ammonia, Br., a sufficiency, or	11 fl.ounces.
Distilled Water, a sufficiency.	

Neutralize the Acid with the Ammonia, adding sufficient Distilled Water to yield 20 fl.ounces (Imperial) of the product. If U. S. stronger Water of Ammonia is used, a larger quantity will be required.

1869. Liquor Antimonii Chloridi. Br.*Solution of Chloride of Antimony — Butter of Antimony — Perchloride of Antimony.*

Purified Black Antimony,	1 pound av.
Hydrochloric Acid, Br.,	80 fl.ounces (Imperial).

Place the Purified Black Antimony in a porcelain vessel, pour upon it the Hydrochloric Acid, and, constantly stirring, apply to the mixture, beneath a flue with a good draft, a little heat, which must be gradually augmented as the evolution of gas begins to slacken un'til the liquid boils. Maintain it at this temperature for fifteen minutes, then remove the vessel from the fire and filter the liquid through calico into another vessel, until clear. Boil this down to the bulk of 40 fl.ounces (Imperial) and preserve it in stopped bottles.

Uses.—This solution is familiarly known as Butter of Antimony, and is used as an escharotic for foul ulcers, and for "fouls" of sheep and cattle, etc. In pharmacy it is used for making the Oxide of Antimony.

1870. Liquor Arsenii et Hydrargyri Iodidi.*Solution of Iodide of Arsenic and Mercury — Donovan's Solution.*

The U. S. formula is:

Iodide of Arsenic, 1 part or 74 grains.
 Red Iodide of Mercury, 1 part or 74 grains.
 Distilled Water sufficient to make 100 parts or 1 pint.

Triturate the Iodides with 15 parts or 2 fl.ounces of Distilled Water until dissolved. Filter the liquid and pass enough Distilled Water through the filter to make 100 parts or 1 pint of the solution.

The Br. formula is 45 grains each Iodide of Arsenicum and Red Iodide of Mercury, dissolved in 10 fl.ounces (Imperial) of Distilled Water.

Uses.—Donovan's Solution contains about 1 per cent. of each of the iodides, and is employed as an alterative, the same as Fowler's, in doses of 3 to 5 minims. It should be largely diluted when prescribed, and may best be given in the form of an elixir, which see (525).

1871. Liquor Arsenitis Potassii.*Solution of Arsenite of Potassium — Fowler's Solution.*

The U. S. formula is:

Arsenious Acid in small pieces, 1 part or 74 grains.
 Bicarbonate of Potassium, 1 part or 74 grains.
 Compound Tincture of Lavender, 3 parts or 2 fl.drachms.
 Distilled Water sufficient to make 100 parts or a pint.

Boil the Arsenious Acid and Bicarbonate of Potassium in a glass vessel with 10 parts or 1½ fl.ounces of Distilled Water until dissolved. Then when cool add the Compound Tincture of Lavender and enough Distilled Water to make 100 parts or a pint of the solution. Then set aside for eight days and filter.

The Br. P., under the name *Liquor Arsenicalis*, directs Arsenious Acid 87 grains, Carbonate of Potassium 87 grains, Compound Tincture of Lavender 5 fl.drachms, Distilled Water a sufficient quantity to make 20 fl.ounces (Imperial).

The German formula *Liquor Kalii Arsenicosi* is the same as the Br. except that Compound Spirit of Balm is used as the flavoring ingredient.

Uses.—Fowler's Solution, as it is popularly known, contains 1 per cent. of Arsenious Acid or about 4½ grains in an ounce. It is much employed in medicine as an alterative in doses of three to five minims. It should be largely diluted when given, and is best exhibited in the form of an elixir, which see (524).

1872. Liquor Atropinæ Sulphatis. Br.*Solution of Sulphate of Atropine.*

Sulphate of Atropine, 1 part or 9 grains.

Camphor Water, 99 fl.parts or 16½ fl.drachms.

Dissolve. The strength is 1 to 100. The dose is one to 4 minims.

A great variety of Solutions of Alkaloidal Salts may be made in a similar manner to this. Some of them are prepared for hypodermic injections and for internal use.

1873. Liquor Bismuthi.*Liquor Bismuth—Solution of Bismuth.*

Citrate of Bismuth and Ammonium, 256 grains.

Water of Ammonia, a sufficient quantity,

Distilled Water, sufficient to make 1 pint.

Rub the Bismuth Salt to a smooth mixture with 2 fl.ounces of Distilled Water, and add Water of Ammonia drop by drop until the salt is dissolved and the solution is clear or nearly clear, then add Distilled Water enough to make a pint, and after standing a few hours filter through paper.

This solution is not official in the U. S., but is such as is furnished by manufacturers and prescribed by physicians under this title. Elixir Bismuth (536) contains the same amount of the salt, and is to be preferred to it.

The Br. P., under the name *Liquor Bismuthi et Ammonii Citratis*, gives the following:

Citrate of Bismuth, 800 grains.

Solution (Water) of Ammonia,	} of each a sufficiency.
Distilled Water,	

Rub the Citrate of Bismuth to a paste with a little of the Water; add the Solution of Ammonia, gradually and with stirring, until the salt is just dissolved, and dilute with Distilled Water to form 20 fl.ounces (Imperial).

This solution contains 5 grains of Citrate of Bismuth in a fl.drachm or about 2½ times as much of the Bismuth Salt as the foregoing, and the dose is ½ to a fl.drachm. In Br. pharmacy it is evaporated over a water-bath to the consistence of a syrup, and spread upon glass in thin layers, to make the Citrate of Bismuth and Ammonium Salt.

A strong solution of Citrate of Bismuth and Ammonium for combining with elixirs, etc., is also given (1924).

1874. Liquor Calcii Chloridi. Br.*Solution of Chloride of Calcium.*

Chloride of Calcium, 88 grains.

Distilled Water, 1 fl.ounce.

Dissolve, and filter if necessary. Dose, 15 to 50 minims.

1875.

Liquor Calcis.*Solution of Lime—Lime Water.*

The U. S. formula is Lime $\frac{1}{2}$ ounce, which is to be slaked by the gradual addition of about 3 fl.ounces of Water, a pint of Water is then to be added and the mixture agitated occasionally for half an hour, and allowed to settle. The Water is then to be poured off and thrown away, and 1 gallon of Distilled Water poured upon the remaining precipitate which is to be mixed with it and allowed to settle, when the clear supernatant fluid is ready for use. It contains about 0.15 per cent. of Hydrate of Calcium in solution.

The Br. P. directs 2 ounces of slaked Lime to be well washed with water, and the washed Lime to be added to 1 gallon (160 fl.ounces Imperial) of Distilled Water. As Solution of Lime is a saturated solution, the U. S. and Br. preparations are the same strength.

Uses.—Solution of Lime, or *Lime Water*, as it is popularly called, is much used to allay irritation of the stomach, nausea, etc., and externally in the form of liniments, washes, etc., to sooth irritation and inflammation. The dose internally is from $\frac{1}{2}$ to 4 fl.ounces.

1876.

Liquor Calcis Chlorinatæ. Br.

Chlorinated Lime, 1 part or	1 ounce av.
Distilled Water, 10 parts or	10 fl.ounces.

Mix them well by triturating in a mortar, and set away in a stoppered bottle for three hours, with occasional agitation, then filter through a calico filter until clear.

1877.

Liquor Calcis Saccharatus. Br.*Saccharated Solution of Lime.*

Slaked Lime,	1 ounce.
Sugar,	2 ounces.
Distilled Water,	20 fl.ounces.

Mix the Lime and Sugar by trituration in a mortar and add the mixture to a bottle containing the Water; shake occasionally for a few hours, and finally decant the clear liquid for use. The Sugar adds to the solubility of the Lime.

Uses.—This solution is given for the same purposes as ordinary Lime Water, the dose being from 15 to 60 minims. The U. S. Syrupus Calcis is a much stronger preparation. See also Stronger Lime Water (852.)

1878.

Liquor Chlori. Br.*Solution of Chlorine—Chlorine Water.*

This is the Aqua Chlori formerly official in the U. S. P. and still official in the Br. P. under the above title. See page 235.

1879.

Liquor Corrosivus. G. P.*Corrosive Liquid.*

Sulphate of Copper,	6 parts.
Sulphate of Zinc,	6 parts.
Vinegar,	70 parts.
Solution Subacetate of Lead,	12 parts.

Dissolve the salts in the Vinegar and add the Solution. This should be freshly prepared for use.

1880.

Liquor Epispasticus. Br.*Blistering Liquid—Linimentum Cantharides.*

Cantharides in powder,	5 ounces.
Acetic Ether sufficient to make	20 fl.ounces.

Mix the Cantharides with 3 fl.ounces of Acetic Ether; pack in the water-bath percolator and allow to stand 24 hours; then pour Acetic Ether on the drug in the percolator, pour hot water in the water-bath surrounding the percolator, allow to stand an hour, and begin to percolate, adding Acetic Ether to the drug and continue the percolation until 20 fl.ounces have passed.

Uses.—This is used in British Pharmacy for preparing *Collodium Vesicans* (see page 242), and is sometimes applied as it is as a counter-irritant or epispastic for neuralgia, etc.

1881.

Liquor Ferri Acetatis.*Solution of Acetate of Iron—Solution of Ferric Acetate.*

The U. S. formula is:

Solution of Tersulphate of Iron, . . .	100 parts or 14½ fl.ounces.
Glacial Acetic Acid,	26 parts or 4¼ fl.ounces.
Water of Ammonia,	80 parts or 16 fl.ounces.
Water, . . . }	of each a sufficient quantity.
Distilled Water, . . . }	

The solution of Iron is diluted with 350 parts or 4 pints of cold Water, and added with constant stirring to the Water of Ammonia previously mixed with 200 parts or 2½ pints of Water. The precipitate is washed as directed, page 44, until the washings cause but a slight precipitate with test solution of Chloride of Barium. It is then drained and pressed as dry as possible and dissolved in the Glacial Acetic Acid, and enough Distilled Water added to the solution to make 100 parts or 1 pint.

This solution should have a sp. gr. of 1.160 and contain 33 per cent. of anhydrous Ferric Acetate. It is used mainly for making Tincture of Acetate of Iron. The dose is 3 to 5 minims.

It is somewhat stronger than the Br. *Liquor Ferri Acetatis Fortior*, which has sp. gr. 1.127, and is made in the same manner with solution Persulphate of Iron 5 fl.ounces, solution of Ammonia a sufficiency, Glacial Acetic Acid 3 fl.ounces, Distilled Water, a sufficiency to make 10 fl.ounces. The *Liquor Ferri Acetatis* of the Br. P. is a solution of the same strength as the Br. Tincture of Acetate of Iron, made by mixing 1 fl.ounce of the Br. strong solution of Acetate of Iron with enough Distilled Water to make 4 fl.ounces. Its sp. gr. should be 1.031.

The German preparation by the same name contains about 5 per cent. of the Iron Salt, and is somewhat stronger than the Br. solution last named.

1882. **Liquor Ferri Dialysatus.**

Solution of Dialysed Iron.

This solution is official in the Br. P. The formula will be found on page 272. It should contain 5 per cent. of Oxide of Iron. *Liquor Ferri Oxchlorate* (1887) is frequently sold for Dialysed Iron, as it is much more readily made.

1883. **Liquor Ferri Chloridi.**

Solution of Chloride of Iron — Solution of Ferric Chloride.

The U. S. formula is:

Iron in the form of fine wire and cut into small	
pieces, 15 parts, or	3½ ounces av.
Hydrochloric Acid, 86 parts, or	16¾ fl.ounces.
Nitric Acid, a sufficient quantity.	
Distilled Water, a sufficient quantity.	

Put the Iron Wire into a flask capable of holding double the volume required and pour upon it 54 parts or 10½ fl.ounces of Hydrochloric Acid previously diluted with 25 parts or 5½ fl.ounces of Distilled Water, and let the mixture stand until effervescence ceases; then heat it to the boiling point; filter through paper, and, having rinsed the flask and Iron Wire with a little boiling Distilled Water, pass the washings through the filter. To the filtered liquid add 27 parts or 5¼ fl.ounces of Hydrochloric Acid and pour the mixture slowly and gradually in a stream into 8 parts, or 1⅓ fl.ounces of Nitric Acid contained in a capacious porcelain vessel. After effervescence ceases, apply heat by means of a sand bath until the liquid is free from nitrous odors. Then test a small portion with freshly prepared test-solution of ferrieyanide of potassium. Should this reagent produce a blue color, add a little more Nitric Acid and evaporate off the excess. Finally, add the remaining 5 parts, or 1 fl.ounce of Hydrochloric Acid and enough Distilled Water to make 100 parts or 1 pint of the liquid, which contains 37.8 per cent. of the anhydrous salt. Its sp. gr. is about 1.40.

The Br. *Liquor Ferri Perchloridi Fortior*, or *Strong Solution of Perchloride of Iron*, is made in the same manner as the foregoing, but contains a trifle more of the iron salt, 4 ounces av. of Iron Wire being used to produce 17½ fl.ounces (Imperial) of the solution. Sp. gr. about 1.42.

The Br. *Liquor Ferri Perchloridi*, or *Solution of Perchloride of Iron*, is the same strength as the Br. Tincture of Perchloride of Iron, and is made by mixing 5 fl.ounces of the strong solution of Perchloride of Iron with sufficient Distilled Water to produce after admixture 20 fl.ounces sp. gr. 1.11. The dose is 10 to 30 minims.

The German *Liquor Ferri Perchloridi*, or *Solution of Perchloride of Iron*, is made in a similar manner as the U. S. solution, but is much weaker, containing only 10 per cent. of Iron. Sp. gr. about 1.280.

Uses.—The Solution of Chloride of Iron is used chiefly for making Tincture of Chloride of Iron, Dialysed Iron and some other Iron preparations. As the same or similar names are applied to solutions of different strengths it is necessary to understand which one is intended.

1884. **Liquor Ferri Citratis. U. S.**

Solution of Citrate of Iron — Solution of Ferric Citrate.

The U. S. formula is:

Solution of Tersulphate of Iron, . . .	105 parts or 10½ ounces av.
Citric Acid,	30 parts or 3 ounces av.
Water of Ammonia,	84 parts or 8½ fl.ounces.
Water, sufficient to make	100 parts or 10 ounces av.

To the Water of Ammonia previously diluted with 200 parts or 20 fl.ounces of Cold Water add, constantly stirring, the Solution of Iron previously diluted with 1000 parts or 6 pints of Cold Water. Wash the precipitate which forms as directed, page 44, until the washings cause but a slight cloudiness with test-solution of chloride of barium; then pour off the Water, drain the precipitate and transfer it to a porcelain dish, add the Citric Ac'd, and heat the mixture on a water-bath to 60° C. (140° F.), stirring constantly until the precipitate is dissolved. Lastly, filter the liquid and evaporate it at the above named temperature to about 100 parts or 10 ounces av. This solution contains about 35.5 per cent. of the anhydrous salt, equivalent to 50 per cent. of the scaled salt.

Uses.—In pharmacy this solution is used for making several other scale salts and solutions of Iron, and is very convenient to use in solutions in place of the scale salt when directed, double the quantity by weight being required.

A solution of Citrate of Iron and Ammonium is used for combining with elixirs, syrups, etc., see 1925.

1885. Liquor Ferri et Quininae Citratis.*Solution of Citrate of Iron and Quinine.*

The U. S. formula is :

Citrate of Iron and Ammonium, . . .	65 parts or 1136 grains.
Quinine (Alkaloid), dried at 100° C. (212° F.)	12 parts or 210 grains.
Citric Acid,	28 parts or 490 grains.
Alcohol,	30 parts or 12 fl. drachms.
Distilled Water, sufficient to make . . .	200 parts or 8 ounces av.

Dissolve the Citrate of Iron and Ammonium in 200 parts or 8 ounces of Distilled Water contained in a weighed capsule, heat the solution to 60° C. (140° F.) on a water-bath, add the Citric Acid, and, when dissolved, add the Quinine, stirring the mixture until a perfect solution has been obtained. Evaporate this to 160 parts or 6 ounces av., allow it to cool, add the Alcohol, and finally enough Distilled Water to make 200 parts or 8 ounces av.

Uses.—This solution is just half the strength of the scaled salt and is very convenient to use in solutions instead of it when required. Double the quantity by weight must be used as is directed of the scaled salt. It may be used instead of the salt in making elixirs, syrups, wines, etc. The dose is from 10 to 20 minims.

1886. Liquor Ferri Nitratis.*Solution of Nitrate of Iron—Solution of Ferric Nitrate.*

The U. S. formula is as follows :

Solution of Tersulphate of Iron, . . .	18 parts or 2½ fl.ounces.
Water of Ammonia,	15 parts or 3 fl.ounces.
Nitric Acid,	7 parts or 7½ drachms.
Distilled Water, {	each sufficient to make 100 parts or 20 ounces av.
Water,	

Dilute the Water of Ammonia with 40 parts or 8 fl.ounces of cold Water and add to it the Solution of Iron previously diluted with 100 parts or 20 fl.ounces of Water, stirring constantly. Wash the precipitate as directed, page 44, until the washings show only a slight cloudiness with test-solution of chloride of barium, then drain it, transfer to a capacious weighed porcelain dish and add the Nitric Acid, stirring until a clear solution is obtained. Finally, add enough Distilled Water to make 100 parts or 2 ounces av.

The Br. *Liquor Ferri Pernitratis*, or *Solution of Pernitrate of Iron*, is made by dissolving 1 ounce av. of Iron Wire in 4½ fl.ounces of Nitric Acid, diluted with 16 fl.ounces of Water, filtering the solution and adding enough water to make 30 fl.ounces (Imperial).

Uses.—This solution is given in doses of 5 to 30 minims as a tonic and astringent.

1887. Liquor Ferri Oxychlorati. G. P.*Solution of Oxychloride of Iron.*

This Solution is official in the G. P.

Solution of Chloride of Iron (G. P.).	35 parts.
Water of Ammonia,	35 parts.
Hydrochloric Acid,	3 parts.
Water, a sufficient quantity.	

Mix 160 parts of Water with the Solution of Chloride of Iron and add it, with constant stirring, to the Water of Ammonia, mixed with 320 parts of Water; wash the precipitate as directed, page 44, and having drained and pressed it, mix it with the Hydrochloric Acid and set aside for three days; then add enough water to bring the specific gravity of the product to 1.050. This liquid contains 3.5 per cent. of Iron. It may be used in place of Solution of Dialysed Iron.

1888. Liquor Ferri Subsulphatis.

*Solution of Subsulphate of Iron — Solution of Basic Ferric Sulphate —
Monsel's Solution.*

The U. S. formula is:

Sulphate of Iron, 77 parts or	13 ounces av.
Sulphuric Acid, 7 parts or	510 grains.
Nitric Acid, {	each sufficient to make 114 parts or 19 ounces av.
Distilled Water, }	

Mix the Sulphuric Acid with 11 parts or 800 grains of Nitric Acid, and 50 parts or 8 fl.ounces of Distilled Water, in a capacious porcelain capsule, and having heated the mixture to the boiling point add the Sulphate of Iron (one fourth at a time), stirring after each addition until effervescence ceases. Should the addition of a few drops of Nitric Acid cause a further evolution of red fumes, cautiously add Nitric Acid until red fumes cease to be evolved. Then keep the solution in brisk ebullition until nitrous vapors are no longer perceptible and the liquid assumes a deep ruby-red tint. Lastly, add enough Distilled Water to make the solution weigh 114 parts or 19 ounces av. It contains 48.7 per cent. of Basic Ferric Sulphate $\text{Fe}_4\text{O}(\text{SO}_4)_5$. Sp. gr. 1.55.

The Br. *Liquor Ferri Persulphatis*, or *Solution of Persulphate of Iron*, is similar to this, and when Solution of Persulphate of Iron is prescribed or directed this should be dispensed. It contains less acid than the Solution of Tersulphate of Iron, and is much stronger of the iron salt.

Uses.— This solution is used as a styptic application for stopping hemorrhages, and is given internally in doses of 3 to 6 minims, diluted with water, as an astringent.

1889. Liquor Ferri Tersulphatis.*Solution of Tersulphate of Iron — Solution of Normal Ferric Sulphate.*

Sulphate of Iron, 80 parts or	8	ounces av.
Sulphuric Acid, 15 parts or	1½	ounces av.
Nitric Acid, }	each a sufficient quantity to make }	20
Distilled Water, 200 parts or		

Mix the Sulphuric Acid with 11 parts or 482 grains of Nitric Acid and with 50 parts or 5 fl.ounces of Distilled Water, and proceed as directed in the foregoing formula, adding enough Distilled Water at last to make 200 parts or 20 ounces av. This solution contains 28.7 per cent of Normal Ferric Sulphate, $\text{Fe}_2(\text{SO}_4)_3$. Its sp. gr. is 1.32.

Uses.—In pharmacy this solution is used in making many other iron preparations, Ferric Hydrate being precipitated from it with Ammonia. For medicinal use the Solution of Subsulphate of Iron is preferred.

1890. Liquor Gutta-Perchæ.*Solution of Gutta-Percha.*

The U. S. formula is—

Gutta-Percha in thin slices,	9	parts.
Commercial Chloroform, by weight,	91	parts.
Carbonate of Lead,	10	parts.

Add the Gutta-Percha to 70 parts of the Chloroform contained in a bottle, cork it well, and shake it occasionally until the Gutta-Percha is dissolved. Then add the Carbonate of Lead previously mixed with the remainder of the Chloroform, and having several times shaken the whole together at intervals of half an hour, set the mixture aside until the insoluble matters have subsided and the solution has become perfectly clear. Lastly, decant the liquid and preserve it in small cork-stoppered vials.

The Br. formula is about the same. Gutta-Percha in thin slices 1 ounce, Chloroform 8 fl.ounces, Carbonate of Lead in fine powder 1 ounce. It is made in the same way.

Uses.—This solution is used in pharmacy for mixing with mustard to make mustard paper, and may be used for other adhesive purposes, and as a cement or glue for rubber, etc.

1891. Liquor Hydrargyri Nitratis.*Solution of Nitrate of Mercury — Solution of Mercuric Nitrate.*

The U. S. formula is :

Red Oxide of Mercury,	60	parts or 4	ounces av.
Nitric Acid,	45	parts or 3	fl.ounces.
Distilled Water,	15	parts or 1½	fl.ounces.

Mix the Nitric Acid with the Water and dissolve the Red Oxide of Mercury in the mixture. Keep the solution in glass-stoppered bottles. This solution contains about 50 per cent. of Mercuric Nitrate $\text{Hg}(\text{N O}_3)_2$.

The solution of Nitrate of Mercury, formerly official, was similar to the Br., which is now called *Liquor Hydrargyri Nitratis Acidus*, or *Acid Solution of Nitrate of Mercury*, and is made by dissolving with the aid of gentle heat 4 ounces av. of Mercury in 5 fl.ounces of Nitric Acid mixed with $1\frac{1}{2}$ fl.ounces of Distilled Water.

Uses. — This solution is used as a caustic application for ulcers, cancers, and malignant sores.

1892. **Liquor Hydrargyri Perchloridi. Br.**

Solution of Perchloride of Mercury.

This is official in the Br. P., made as follows :

Perchloride of Mercury (Corrosive Sublimate),	10 grains.
Chloride of Ammonium,	10 grains.
Distilled Water (Imperial measure),	20 fl.ounces.

Dissolve. The dose is $\frac{1}{2}$ fl.drachm to 2 fl.drachms.

1893. **Liquor Iodi Compositus.**

Compound Solution of Iodine — Lugol's Solution.

The U. S. formula is :

Iodine,	5 parts or $\frac{1}{2}$ ounce av.
Iodide of Potassium,	10 parts or 1 ounce av.
Distilled Water,	85 parts or $8\frac{3}{8}$ fl.ounces.

Dissolve the Iodine and Iodide of Potassium in the Distilled Water, and keep the solution in well-stopped bottles.

The Br. P. under the heading *Liquor Iodi* or Solution of Iodine directs Iodine 10 parts, Iodide of Potassium 15 parts, Distilled Water 200 parts. The percentage of Iodine is the same as in the U. S. formula.

Uses.—Lugol's Solution, as it is popularly known is given internally in doses of 3 to 5 minims diluted with water, as an alterative and absorbent.

The following are well-known similar unofficial solutions of Iodine Compound :

1894. Churchill's Iodine Caustic.—Iodine 60 grains, Iodide of Potassium 120 grains, Water 4 fl.drachms. For external use.

1895. Magendie's Iodine Solution.—Iodine 2 grains, Iodide of Potassium 240 grains, Peppermint Water 6 fl.ounces. Dose, a teaspoonful or more.

1896. Liquor Kalii Acetici. G. P.*Solution of Acetate of Potassium.*

Acetic Acid (G. P.),	100 parts.
Bicarbonate of Potassium,	48 parts.
Water, sufficient to make	147 parts.

Add the Bicarbonate of Potassium gradually to the Acetic Acid, and heat the Solution to boiling; then neutralize with Bicarbonate of Potassium and add sufficient Water to make 147 parts.

Three parts of the Solution contain one part of the dry salt.

1897. Liquor Kalii Carbonici. G. P.*Solution of Carbonate of Potassium.*

Pure Carbonate of Potassium,	11 parts.
Water,	20 parts.

Dissolve the salt in the Water, and filter the Solution.

Three parts of the Solution contain one part of the dry salt.

1898. Liquor Lithiæ Effervescens. Br.*Effervescing Solution of Lithia—Lithia Water.*

This is made by adding 10 grains of Carbonate of Lithium to 20 fl.ounces of Water and charging with Carbonic Acid Gas to about 60 pounds pressure, in strong glass bottles. It is used for kidney diseases. The dose is 5 to 10 fl.ounces.

1899. Liquor Magnesii Carbonatis. Br.*Solution of Carbonate of Magnesium—Fluid Magnesia.*

Sulphate of Magnesium (Epsom Salt).	2 ounces av.
Carbonate of Sodium (Sal Soda),	2½ ounces av.
Distilled Water, a sufficiency.	

Dissolve the Salts separately each in half a pint of water. Heat the Solution of Sulphate of Magnesium to the boiling point and add to it the Solution of Carbonate of Sodium and boil them together until Carbonic Acid ceases to be evolved. Wash the precipitate as directed, page 44, until the washings cease to give a precipitate with test solution of Chloride of Barium. Mix the precipitate with 20 fl.ounces of Distilled Water and charge with Carbonic Acid Gas to about 50 pounds pressure. Let stand under pressure for 24 hours, then filter to remove any undissolved Carbonate of Magnesium and charge again with gas in bottles.

This solution contains about 2 per cent. of Magnesia. The dose is 1 to 2 fl.ounces.

Fluid Magnesia is a popular remedy in Great Britain, but is little used in this country.

1900.

Liquor Magnesii Citratis.*Solution of Citrate of Magnesium.*

Carbonate of Magnesium,	200 grains.
Citric Acid,	400 grains.
Syrup of Citric Acid,	2 fl.ounces.
Bicarbonate of Potassium,	30 grains.
Water, a sufficient quantity.	

Dissolve the Citric Acid in 4 fl.ounces of Water, and, having added the Carbonate of Magnesium, stir occasionally until it is dissolved. Filter the solution into a strong bottle of 12 fl.ounces capacity, containing the Syrup of Citric Acid, then add, without agitation, Water previously boiled and filtered to nearly fill the bottle, and, lastly, add the Bicarbonate of Potassium in Crystals and immediately close the bottle with a good cork, which must be tied down with twine.

The Br. formula directs $\frac{1}{2}$ fl.ounce Syrup of Lemons instead of the Syrup of Citric Acid, and 40 grains instead of 30 grains of Bicarbonate of Potassium.

Uses.—This solution is familiarly known as "Citrate of Magnesia," and is used as a laxative and refrigerant, in doses of a bottle or less.

1901. Permanent Solution Citrate of Magnesium.

As made by the foregoing formula this solution soon decomposes and becomes unfit for use. The following is proposed as an unalterable solution that will keep indefinitely:

Boric Acid,	1 ounce av.
Citric Acid,	6 ounces av.
Carbonate of Magnesium,	3½ ounces av.
Distilled Water,	40 fl.ounces.

Dissolve the Boric Acid in 20 fl.ounces of hot water, add the Citric Acid and the remainder of the water. When cool add the Carbonate of Magnesium, dissolve and filter the solution. To 8 fl.ounces of this solution in a 12-ounce bottle add 2 ounces Syrup Citric Acid and 30 grains Bicarbonate of Potassium. Cork and tie down in the usual manner.

1902.

Liquor Morphinæ Acetatis. Br.*Solution of Acetate of Morphine.*

Acetate of Morphine,	9 grains or 1 part.
Diluted Acetic Acid,	18 minims or 2 fl.parts.
Rectified Spirit,	½ fl.ounce or 24 fl.parts.
Distilled Water,	1½ fl.ounces or 73 fl.parts.

Mix the Acid, the Spirit and the Water and dissolve the Acetate of Morphine in the solution. The solution contains 1 per cent. of the Salt. The dose is 10 to 60 minims.

1903. Liquor Morphinae Bimeconatis. Br.*Solution of Bimeconate of Morphine.*

Hydrochlorate of Morphine,	9 grains.
Solution (Water) of Ammonia, a sufficiency.	
Meconic Acid,	6 grains.
Rectified Spirit,	½ fl.ounce.
Distilled Water, a sufficiency.	

Dissolve the Morphine salt in two or three drachms of Distilled Water, by the aid of heat, then add the solution of Ammonia until Morphine ceases to be precipitated. Cool, filter, wash the precipitate with distilled water until the washings cease to give a precipitate with Nitrate of Silver. Drain, mix the precipitate with sufficient water to produce an ounce and a half, add the Rectified Spirit and the Meconic Acid, and dissolve.

This solution may also be made by dissolving $5\frac{1}{2}$ grains of Bimeconate of Morphine in water 5 fl.drachms mixed with Alcohol 3 fl.drachms. It is about the same strength as Tincture of Opium.

Uses.—This solution is considerably used in place of Tincture of Opium in doses of 5 to 40 minims.

1904. Liquor Morphinae Hydrochloratis. Br.*Solution of Hydrochlorate of Morphine.*

Hydrochlorate of Morphine,	9 grains or 1 part.
Diluted Hydrochloric Acid,	18 minims or 2 fl.parts.
Rectified Spirit,	½ fl.ounce or 24 fl.parts.
Distilled Water,	1 ½ fl.ounce or 73 fl.parts.

Mix the Hydrochloric Acid, the spirit and the water and dissolve the Morphine salt in the mixture. It contains 1 per cent. of the Morphine salt. The dose is 10 to 60 minims.

1905. Liquor Morphinae Sulphatis.*Solution of Sulphate of Morphine.*

Although this solution is not now official it is more frequently prescribed in this country than any of the foregoing solutions of Morphine.

The formula of the 1870 U. S. P. was :

Sulphate of Morphine,	8 grains.
Distilled Water,	8 fl.ounces.

Dissolve the Morphine salt in the Water. Dose, $\frac{1}{8}$ grain. Elixir Morphine (697) is preferable to this solution, and of the same strength.

Magendie's Solution of Morphine is made with Sulphate of Morphine 8 grains, Distilled Water 1 fl.ounce. This should never be dispensed unless it is definitely prescribed or directed.

1906. Liquor Pepsini. U. S.*Solution of Pepsin — Liquid Pepsin.*

Saccharated Pepsin,	40 parts or 300 grains.
Hydrochloric Acid,	12 parts or 66 minims.
Glycerin,	400 parts or 5 fl.ounces.
Water,	548 parts or 8 fl.ounces.

Dissolve the Saccharated Pepsin in the Water previously mixed with the Hydrochloric Acid, add the Glycerin, let the mixture stand 24 hours, and filter or strain.

Uses.—Solution of Pepsin is given as an aid to digestion in doses of 2 to 4 fl.drachms, or more.

1907. Solution of Lactopeptine or *Liquid Lactopeptine* may be made in the same proportions and manner as the above. Lactic Acid may be used instead of Hydrochloric Acid.

Liquor Pancreo-Pepsin may be made by macerating Saccharated Pepsin 256 grains, Saccharated Pancreatin 128 grains, in a mixture of Hydrochloric Acid 90 minims, Lactic Acid 60 minims, Glycerin 5 fl.ounces, Water 11 fl.ounces; then filter. This is similar to Solution of Lactopeptine.

1908. Liquor Plumbi Subacetatis.*Solution of Subacetate of Lead — Goulard's Extract.*

The U. S. formula is :

Acetate of Lead,	170 parts or 1900 grains.
Oxide of Lead (Litharge),	120 parts or 1242 grains.
Distilled Water, sufficient to make,	1000 parts or 10 fl.ounces.

Dissolve the Acetate of Lead in 800 parts or 10 fl.ounces of boiling Distilled Water in a glass or porcelain vessel. Then add the Oxide of Lead and boil for half an hour, adding a little Distilled Water from time to time to make up for the evaporation. Remove the heat, allow the liquid to cool, and add enough Distilled Water previously boiled to make 1000 parts or 10 fl.ounces and finally filter. Sp. gr. 1.228.

The Br. P. directs Acetate of Lead 5 ounces av., Oxide of Lead 5½ ounces av., Distilled Water sufficient to make 20 fl.ounces (Imperial measure), to be made in the same manner as the foregoing. Sp. gr., 1.275.

The German official preparation is made with Acetate of Lead 3 parts, Oxide of Lead 1 part, Distilled Water 10 parts, by melting the lead salts with one-twentieth part of the water on a water-bath and continuing the heat until the yellowish color of the mixture has changed to a white or reddish white, then adding the remainder of the water, setting aside and filtering. Sp. gr. 1.235.

Uses.—This solution is used in Pharmacy for making cerate and liniment of Subacetate of Lead, and in medicine as an astringent and sedative application to inflamed surfaces, for injections, etc. It is generally diluted before using.

1909. Liquor Plumbi Subacetatis Dilutus.*Diluted Solution of Subacetate of Lead—Lead Water.*

This is the foregoing solution diluted, the U. S. formula being:

Solution of Subacetate of Lead, . . .	3 parts or 2 fl.drachms.
Distilled Water,	97 parts or 10 fl.ounces.

Mix the solution with the water previously boiled and cooled.

The Br. P. directs Solution of Subacetate of Lead 2 fl.drachms, Rectified Spirit 2 fl.drachms, Distilled Water 19½ fl.ounces, (Imperial measure) making a preparation only half the strength of the U. S.

Uses.—This is used as a soothing application, etc., the same as the foregoing.

1910. Liquor Potassæ.*Solution of Potassa.*

The U. S. formula is:

Bicarbonate of Potassium,	90 parts or 2½ ounces av.
Lime,	40 parts or 1 ounce av.
Distilled Water, sufficient to make, .	1000 parts or 24 fl.ounces.

Dissolve the Bicarbonate of Potassium in 400 parts or 10 fl.ounces of Distilled Water, heat the solution until effervescence ceases and then raise it to boiling. Slake the Lime, make it into a smooth paste with 400 parts or 10 fl.ounces of Distilled Water and heat to boiling, then gradually add the first liquid to the second and continue the boiling for 10 minutes. Remove the heat, cover tightly, and when cold add enough Distilled Water to make 1000 parts or 1½ pints. Lastly, strain through linen, set the liquid aside until it is clear, and decant.

Simple Process.—This may also be made by dissolving 1 ounce av. of Potassa (Caustic Potash) in a pint of Distilled Water; this is the method most generally employed by druggists. The U. S. preparation contains about 5 per cent. of Hydrate of Potassium.

The Br. formula is Carbonate of Potassium 1 pound av., Slaked Lime 12 ounces av., Distilled Water 1 gallon (Imperial measure). The solution is made in a similar manner to the U. S., and contains 5.84 per cent. of the hydrate.

The German *Liquor Kali Caustici*, contains nearly 15 per cent. of the hydrate and must not be used when the U. S. or Br. solutions are intended.

Uses.—In pharmacy Solution of Potassa is frequently used to saponify balsams or oils in mixtures, and in medicine is given largely diluted as an alkali or antacid.

1911. Liquor Potassii Arsenitis.*Solution of Arsenite of Potassium — Fowler's Solution.*

Arsenious Acid in small pieces,	1 part or 74 grains.
Bicarbonate of Potassium,	1 part or 74 grains.
Compound Tincture of Lavender,	3 parts or 2 fl.drachms.
Distilled Water sufficient to make	100 parts or 1 pint.

Boil the Arsenious Acid and Bicarbonate of Potassium in a glass vessel with 10 parts or 1½ fl.ounce of Distilled water until the acid is completely dissolved. Then add the Compound Tincture of Lavender and enough Distilled Water to make 100 parts or 1 pint; set the mixture aside for 8 days and filter through paper.

1912. Liquor Potassii Citratis. U. S.

Citric Acid,	6 parts or 480 grains.
Bicarbonate of Potassium,	8 parts or 640 grains.
Water, a sufficient quantity.	

Dissolve the Acid and Potassium salt, each separately in 40 parts or about 6 fl.ounces of Water. Filter the solutions and wash the filters with enough water to make 50 parts or 8 fl.ounces of each. Then mix them together and when effervescence has ceased, bottle. It should be freshly made when wanted for use.

Concentrated solutions of these salts, made double the strength of the above, may be made and kept on hand for making this solution. Then for each fl.ounce of the solution required mix 2 fl.drachms of each solution with enough Water to make 1 fl.ounce.

Uses.—This solution is used as a cooling draught and diaphoretic in doses of 1 or 2 teaspoonfuls mixed with water.

A strong solution of Citrate of Potassium is also made for combining with elixirs, etc. (1926).

1913. Liquor Potassæ Effervescens. Br.*Effervescing Solution of Potash — Potash Water.*

Bicarbonate of Potassium,	30 grains.
Water,	20 fl.ounces.

Dissolve the Salt in the Water and charge with Carbonic Acid Gas to about 60 pounds pressure, then bottle under pressure.

Uses.—This is given in doses of 2 to 4 fl.ounces as an antacid or alkaline draught.

1914. Liquor Potassii Permanganatis. Br.*Solution of Permanganate of Potassium.*

Permanganate of Potassium, 88 grains.

Distilled Water (Imperial measure), 20 fl.ounces.

Dissolve.

This solution was official in the 1870 U. S. P.; 4 grains of the salt being dissolved in 1 fl.ounce of water.

Uses.—It is given in doses of 2 to 4 fl.drachms for foul stomach, bad breath, etc.; also used externally as a wash for sores, ulcers, etc.

1915. Liquor Sodæ.*Solution of Soda.*

The U. S. formula is :

Carbonate of Sodium, 180 parts or 5 ounces av.

Lime, 60 parts or 1½ ounces av.

Distilled Water sufficient to make . 1000 parts or 24 fl.ounces.

Dissolve the Carbonate of Sodium in 400 parts or 10 fl.ounces of boiling Distilled Water. Slake the Lime and make it into a smooth mixture with 400 parts or 10 fl.ounces of Distilled Water and heat to boiling. Then gradually add the first liquid to the second and continue the boiling for 10 minutes. Remove the heat, cover the vessel tightly, and when cold add enough Distilled Water to make 1000 parts or 1½ pints. Lastly, strain through linen, set the liquid aside until clear, and decant.

Simple Process.—This may also be made by dissolving 1 ounce av. of Soda (Caustic Soda) in a pint of Distilled Water, and this method is generally employed by druggists.

The U. S. preparation contains about 5 per cent. of Sodium Hydrate.

The Br. formula is Carbonate of Sodium 28 ounces, Slaked Lime 12 ounces, Distilled Water 1 gallon (Imperial measure). The solution is made in a similar manner to the U. S. and contains a little more than 4 per cent. of Sodium Hydrate.

The German *Liquor Natri Caustici* contains nearly 15 per cent. of the Hydrate and must not be used when the U. S. or Br. solutions are intended.

Uses.—This solution is used for similar purposes and in the same doses as Solution of Potassa, the last named being generally preferred for medicinal uses.

1916. Liquor Sodæ Chloratæ. U. S.*Solution of Chlorinated Soda—Liquor Sodæ Chlorinatæ. Br.*

The U. S. formula is :

Carbonate of Sodium, 100 parts or 25 ounces av.

Chlorinated Lime, 80 parts or 20 ounces av.

Water sufficient to make 1000 parts or 14 pints.

Mix the Chlorinated Lime intimately with 400 parts or 5½ pints of Water in a tarred vessel provided with a closely fitting cover. Dissolve the Carbonate of Sodium in 400 parts or 5½ pints of boiling Water, and immediately pour the latter solution into the former; cover the vessel tightly, and when the contents are cold, add enough Water to make 1000 parts or 14 pints. Lastly, strain the mixture through muslin, allow the precipitate to subside and remove the clear solution by means of a siphon, or decant.

The Br. formula is Carbonate of Sodium 24 ounces av., Chlorinated Lime 16 ounces av., Distilled Water 1 gallon (Imperial measure). It is made in a similar manner.

The solution of Chlorinated Lime was formerly called *Labarraque's Solution* or Liquor of Chloride of Oxide of Soda. It differs from *Eau de Javelle* (Javelle Water) in being prepared with Carbonate of Sodium instead of Carbonate of Potassium, but its uses are similar.

Uses.—This solution is used as a deodorizer and disinfectant also for bleaching and removing fruit stains from linen, and is given as an antiseptic in doses of 10 to 20 minims; also used as a gargle and for insufflating largely diluted with Water.

1917.**Liquor Sodii Arseniatis.**

Solution of Arseniate of Sodium.

Arseniate of Sodium, rendered anhydrous by a temperature not exceeding

300° F. (148° 9 C.), 9 grains or 1 part.

Distilled Water, 2 fl.ounces or 99 fl.parts.

Dissolve. Dose 5 to 10 minims.

The Br. formula is the same.

Uses.—This solution is used for the same purposes as Fowler's Solution. It contains 1 per cent. of the Arsenic salt.

1918.**Liquor Sodii Ethylatis. Br.**

Solution of Ethylate of Sodium.

Metallic Sodium, free from Oxide, 22 grains.

Ethylie (Common) Alcohol, 1 fl.ounce.

Dissolve the Sodium in the Alcohol contained in a flask, the latter being kept cool in a stream of cold water. The solution should be recently prepared.

1919.**Liquor Sodii Silicatis.**

Solution of Silicate of Sodium — Liquid Glass — Water Glass.

This may be made by mixing one part of fine sand and two parts of dried Carbonate of Sodium together and fusing them in an earthenware crucible,

pouring out the fused mass on a slab, and, when cool, powdering it and dissolving its soluble portion in water by the aid of heat; the clear liquid being decanted and reduced to a liquid of the consistence of thick syrup by evaporation. It contains about 30 per cent. of the salt.

Uses.—This solution is known commercially as *Liquid Glass*, and is used in making cements, kalsomine preparations, plaster compositions, wood filling, and many other like purposes. It is frequently added to cheap soaps to increase their weight and make them absorb more water. In surgery, it is used in preparing mechanical dressings; and in dentistry, for mixing with plaster for casts, making cements, etc.

1920. **Liquor Strychninæ Hydrochloratis. Br.**

Solution of Hydrochlorate of Strychnine — Liquor Strychninæ.

Strychine in Crystals,	9 grains or 1 part.
Diluted Hydrochloric Acid,	14 minims or 2 fl.parts.
Rectified Spirit,	½ fl.ounce or 24 fl.parts.
Distilled Water,	1½ fl.ounce or 73 fl.parts.

Mix the Acid with 4 drachms of the Water and dissolve the Strychnine in the mixture by the aid of heat; then add the Spirit and remainder of the Water. This solution contains 1 per cent. of Strychnine and may be given in doses of 5 to 10 minims.

1921. **Liquor Zinci Chloridi.**

Solution of Chloride of Zinc.

The U. S. formula is :

Zinc, Granulated,	240 parts or 6¼ ounces av.
Nitric Acid,	12 parts or 100 minims.
Precipitated Carbonate of Zinc, . .	12 parts or 136 grains.
Hydrochloric Acid, }	each a sufficient quantity.
Distilled Water, . }	

To the Zinc contained in a glass or porcelain vessel, add, gradually, enough Hydrochloric Acid to dissolve it; then strain the solution, add the Nitric Acid, evaporate to dryness, and bring the dry mass to fusion. Let it cool, dissolve it in 150 parts or 4½ fl.ounces of Distilled Water, add the precipitated Carbonate of Zinc and agitate the mixture occasionally during 24 hours. Finally, filter through white filtering paper free from iron and pass enough Distilled Water through the filter to make 1000 parts or 1 pint of the solution, which contains about 50 per cent. of Chloride of Zinc.

The Br. formula is Granulated Zinc 1 pound av., Hydrochloric Acid 44 fl.ounces, Solution of Chlorine (Chlorine Water) a sufficiency, Carbonate of

Zinc, $\frac{1}{2}$ ounce, or a sufficiency, Distilled Water 20 fl.ounces; to be made into 2 pints (Imperial measure) of solution.

Solution of Chloride of Zinc may also be conveniently made by dissolving 1 ounce av. of granular Chloride of Zinc in 1 fl.ounce of Distilled Water. This is the method usually employed by druggists. A common cheap solution of Chloride of Zinc for disinfecting may be made by dissolving Zinc in strips or cuttings in commercial Hydrochloric Acid to saturation.

Uses.—This solution is used mainly as a disinfectant and antiseptic. *Embalming Fluids* are chiefly diluted solutions of Chloride of Zinc.

Unofficial Solutions.

USED FOR COMBINING WITH ELIXIRS, SYRUPS, ETC.

The preparations included under this heading are mostly strong solutions of chemical salts, convenient for combining with elixirs, emulsions, syrups, etc. A few, however, are intended to be used or prescribed as they are. Several other solutions useful for similar purposes will be found under other headings, as coloring solutions, dialysates, official solutions, etc. These are the solutions which are referred to in the various elixirs, emulsions, syrups, etc., when it is noted that "an equivalent quantity of the solution of the specified salt may be used."

They are given more prominence in this work than the official solutions, because of their use as described.

1922. Solution of Carbolic Acid.

Although a standard solution of Carbolic Acid is not official, such a preparation is furnished by manufacturers and by common consent is made to contain 5 grains of Carbolic Acid in each fl.drachm. It may be made as follows:

Carbolic Acid (Crystals),	640 grains.
Glycerin, }	each, a sufficient quantity.
Water, }	

Liquefy the Acid by the aid of heat and add 2 ounces of Glycerin to the solution, then add enough Water to make the measure 14 fl.ounces. If the solution is then clear add enough

Water to make 16 fl.ounces, but if it should be "milky" add enough Glycerin to make clear, and then sufficient water to make the measure a pint, and filter.

Solutions of Carbolic Acid of other strengths may be made in the same manner. See, also, Nos. 29 and 1750.

1923. Solution Chloride of Iron. (Tasteless.)

TASTELESS TINCTURE CHLORIDE OF IRON.

Solution Chloride of Iron (1883), . . .	4 fl.ounces.
Carbonate of Sodium,	10 ounces av.
Citric Acid,	6 ounces av.
Water, q. s. to make,	1 pint.

Dissolve the Citric Acid in 4 fl.ounces of boiling Water and add the Carbonate of Sodium, in crystals, gradually until all is added and effervescence has ceased; then add the Solution of Chloride of Iron and enough Water to make a pint of the solution. This is a Solution of *Citro-Chloride of Iron and Sodium*.

It may also be made by dissolving 6 ounces av. of Citrate of Potassium or Citrate of Sodium in half a pint of Water and adding the Solution of Iron and then enough Water to make the measure a pint.

Uses.—This solution is the same strength of Chloride of Iron as the official Tincture Chloride of Iron, and may be used for the same purposes and in the same dose. It is somewhat acid, but the styptic taste of the Iron is avoided. It is used in making several elixirs and syrups, as Elixir Gentian with Tincture Chloride of Iron, etc., and is employed in the same quantity as the official tincture.

1924. Solution Citrate of Bismuth and Ammonium.

For combining with elixirs, etc., a strong solution of Citrate of Bismuth and Ammonium is desirable to use instead of the salt, as an equivalent quantity may be added to any prepara-

tion and thus save the time and trouble of dissolving the salt. It may be made as follows :

Citrate of Bismuth and Ammonium, . $8\frac{1}{3}$ ounces av.
 Water of Ammonia, q. s., about, . . $1\frac{1}{2}$ fl.ounce.
 Warm Water, sufficient to make, . . 1 pint.

To 8 ounces of Warm Water contained in a mortar add the Bismuth Salt in small portions at a time and Water of Ammonia a little at a time, rubbing them well together until the salt is all dissolved, taking care that Ammonia shall not be in excess enough for its odor to be noticeable, then add sufficient water to make a pint, and filter or decant.

This solution contains 50 per cent. of the Bismuth Salt, therefore, in using it in elixirs, etc., where Citrate of Bismuth and Ammonium is directed, *twice the quantity stated of the salt*, or 2 minims for each grain should be used.

1925. Solution of Citrate of Iron and Ammonium.

Citrate of Iron and Ammonium, . . $8\frac{1}{3}$ ounces av.
 Water, sufficient to make, 1 pint.

Dissolve the Iron Salt in half a pint of hot water, and when cool add enough water to make a pint.

This is a 50 per cent. solution convenient for using in elixirs, syrups, etc., when the scale salt is directed. Use 2 minims for each grain of the salt directed in the formula.

Solution of Citrate of Iron (1884) may be used in many preparations instead of this, but is not so readily held in solution.

1926. Solution Citrate of Potassium.

Carbonate of Potassium, 8 ounces av.
 Citric Acid, 6 ounces av.
 Water, sufficient to make, 20 fl.ounces.

Dissolve the Carbonate of Potassium in 10 fl.ounces of Water and add the Citric Acid a little at a time. When all has

been added and effervescence ceases, add enough Water to make 20 fl.ounces of the solution and filter. Use double the quantity of this solution as is directed of the salt in the formula.

1927. Solution of Citric Acid.

A convenient Solution of Citric Acid for combining may be made as follows:

Citric Acid, $8\frac{1}{3}$ ounces av.
Water, sufficient to make 1 pint.

Dissolve the Acid in half a pint of hot water and when cool make up the measure with water to a pint.

This is a 50 per cent. solution and will keep without change. Use 2 minims of this solution for each grain of Citric Acid directed in the formula.

1928. Solution Hypophosphite of Iron.

Solution Phosphate of Iron (1936), . . . 2 fl.ounces.
Hypophosphorus Acid, diluted (34), . . . 1 fl.ounce.
Glycerin, 1 fl.ounce.

Mix them.

Although this is not, chemically, a *true* solution of Hypophosphite of Iron, it is, in effect, the same for all pharmaceutical and medicinal use, and is readily made and permanent.

Four minims of this Solution represents one grain of the Iron salt.

1929. Solution Hypophosphite of Manganese.

Hypophosphite of Manganese, . . . 480 grains.
Hypophosphorus Acid, diluted (34), . . . 3 fl.ounces.
Water, sufficient to make 4 fl.ounces.

Dissolve the Manganese salt in the Acid by the aid of gentle heat and add Water sufficient to make the measure 4 fl.ounces.

Four minims of this solution represents one grain of the Manganese salt.

1930. Solution of Hypophosphites Compound.

Hypophosphite of Calcium,	256 grains.
Hypophosphite of Sodium,	128 grains.
Hypophosphite of Potassium,	64 grains.
Hypophosphite of Iron Solution,	4 fl.drachms.
Hypophosphorous Acid, diluted,	4 fl.drachms.
Water, sufficient to make	1 pint.

Rub the Hypophosphite salts to a fine powder and then with Water in portions of 4 ounces each until they are dissolved; add the Solution and Acid, and filter.

This Solution is not intended to combine with other preparations but to be used as it is. It is similar to a preparation which was once extensively sold as a proprietary medicine, as "*Churchill's Solution of Hypophosphites Compound*," but it has been mostly superseded by various syrups of Hypophosphites.

A fl.drachm contains about 4 grains of Hypophosphites. The dose is a teaspoonful to a dessertspoonful.

1931. Solution Lactophosphate of Calcium (Lime).

Solution Phosphate of Calcium (1935),	8 fl.ounces.
Concentrated Lactic Acid,	1 fl.ounce.

Evaporate the Solution of Phosphate of Calcium by the heat of a water-bath to 7 fl.ounces, and when cool add the Concentrated Lactic Acid.

This Solution may also be made by dissolving 1 ounce of Soluble Lactophosphate of Lime in sufficient Water to make 4 fl.ounces.

Four minims of this Solution represents one grain of Lactophosphate of Calcium.

1932. Solution Lactophosphate of Iron.

Solution Phosphate of Iron,	2 fl.ounces.
Glycerin,	1 fl.ounce.
Concentrated Lactic Acid,	1 fl.ounce.

Mix them.

Four minims of this Solution represents one grain of the Iron salt. It is not, strictly speaking, a Solution of Lactophosphate of Iron but of the Compound Phosphate of Iron with Lactic Acid. It is conveniently made and may be used for all pharmaceutical and medicinal purposes, where Lactophosphate of Iron is desired in solution.

1933. Lactophosphate of Manganese.

Solution Phosphate of Manganese, . . 8 fl.ounces.

Concentrated Lactic Acid, 1 fl.ounce.

Evaporate the Solution of Phosphate of Manganese by the heat of a water-bath to 7 fl.ounces, and when cool add the Lactic Acid.

Four minims of this Solution represents one grain of Lactophosphate of Manganese.

1934. Solution of Lactophosphates Compound.

Solution Lactophosphate of Calcium, . . 2 fl.ounces.

Solution Lactophosphate of Iron, . . 1 fl.ounce.

Mix them.

This solution may be used in making some elixirs, syrups, etc., or may be diluted with 10 parts of Water and employed as a medicine, in doses of a teaspoonful or more.

Four minims of the Solution represents one grain of the Lactophosphates combined in the proportion of $\frac{2}{3}$ gr. Lactophosphate of Calcium and $\frac{1}{3}$ gr. Lactophosphate of Iron.

1935. Solution Phosphate of Calcium (Lime).

Precipitated Phosphate of Calcium, . . 2 ounces av.

Phosphoric Acid, 50 per cent. (U. S. 1880), 6 fl.ounces.

Distilled Water, a sufficient quantity.

Put the Phosphoric Acid in a porcelain evaporating dish and add the Phosphate of Calcium in small portions, stirring it well with the Acid. When all is added heat moderately by a water-bath, stirring occasionally for several hours, then heat

on a sand-bath to about 240° F., stirring occasionally for several hours, until the liquid is reduced to a granular crystalline mass. Allow this to cool, and add sufficient distilled Water that when dissolved the liquid shall measure 10 fl.ounces, and filter. As this is a saturated Solution it may happen that it will solidify or become gelatinous, but it is only necessary to add to it a small quantity of Water and dissolve by the heat of a water-bath before using.

Four minims of this Solution represents about one grain of the Salt, which, in this Solution, is converted from the Phosphate into the Biphosphate of Calcium.

This Solution is used for making several elixirs, syrups, etc., and as the basis of Solution Lactophosphate of Calcium. A soluble salt, Biphosphate of Calcium, may be prepared by concentrating this Solution and crystallizing.

A Solution of Phosphate of Lime or Calcium has formerly been prepared by dissolving precipitated Phosphate of Calcium in sufficient Hydrochloric Acid, diluted with Water, filtering the solution, precipitating it with Ammonia or Solutions of the Alkaline Carbonates, washing the precipitate, draining and pressing it, and dissolving it in Phosphoric Acid, but it is believed the method as above described will be more satisfactory.

1936. Solution Phosphate of Iron.

Phosphate of Iron, in scales (1880), . $4\frac{1}{8}$ ounces av.
 Glycerin, 2 fl.ounces.
 Water, sufficient to make 8 fl.ounces.

Heat 6 fl.ounces of Water to boiling in an evaporating dish and add the Iron salt in small portions at a time, stirring constantly, and continuing the heat until all has been added and dissolved, then add the Glycerin and evaporate the liquid carefully until it measures 8 fl.ounces. This solution contains 50 per cent. of the Iron Salt. Two minims of this solution contains 1 grain of the Iron Salt, therefore double the quantity of minims as is directed of grains in the formulas may be used. It is very convenient to keep prepared in this form for general dispensing purposes, as well as for making Elixirs, Syrups, etc.

A solution of Phosphate of Iron was formerly made by precipitating a solution of Phosphate of Sodium with a solution of Sulphate of Iron,

washing the precipitate, draining and pressing it and dissolving it in Phosphoric Acid, using the same proportions and method as is directed for making solution Phosphate of Manganese; but the introduction of the Scale Salt Phosphate of Iron gives us a much better preparation, made with much less trouble.

1937. Solution Phosphate of Manganese.

Sulphate of Manganese,	5 ounces av.
Phosphate of Sodium,	7 ounces av.
Phosphoric Acid, 50 per cent., .. .	8 fl.ounces.
Sugar,	5 ounces av.
Water, a sufficient quantity.	

Dissolve the Manganese and Sodium Salts separately, each in 4 pints of warm Water, and add the Solution of Sulphate of Manganese to the Solution of Phosphate of Sodium. Wash the precipitate as directed, page 44, collect, drain and press out the Water as much as possible, then dissolve the moist precipitate in the Phosphoric Acid, add the Sugar to the solution and sufficient Water to make the measure 20 fl.ounces and filter. Use 4 minims of this solution as an equivalent of 1 grain of the salt when directed in liquid preparations.

1938. Solution of Phosphates Compound, Concentrated.

Solution Phosphate of Calcium, . .	12 fl.ounces.
Solution Phosphate of Iron, . . .	1 fl.ounce.
Phosphate of Sodium,	320 grains.
Carbonate of Potassium,	128 grains.
Carbonate of Magnesium,	128 grains.
Phosphoric Acid, 50 per cent., . .	1 fl.ounce.
Water, sufficient to make,	1 pint.

Mix the solution of Phosphate of Calcium and Iron, add the Carbonate of Magnesium and Potassium to the Phosphoric Acid, and when effervescence has ceased, add the Phosphate of Sodium, in fine powder, and 1 ounce of warm Water. Mix the two solutions and add enough Water to make the measure a pint.

A fl.drachm of this solution contains about 12 grains Phosphate of Calcium, 2 grains Phosphate of Iron, $2\frac{1}{2}$ grains Phosphate of Sodium, and 1 grain each Phosphate of Potassium and Magnesium, with excess of Phosphoric Acid. It is similar in composition to nearly all the Compound Elixirs, Syrups, and solutions of Phosphates Compound, and may be used for making them by diluting with Elixir, Syrup, Water or other liquids. It is also used for making "Acid Phosphate," and "Fruit Phosphates," for Soda Water, etc.

A formula for this solution was published in THE FORMULARY, August, 1885, of which the following is an abstract, but it is believed the foregoing will be more satisfactory :

Phosphate of Calcium, 32 ounces, is dissolved in a sufficiency of Hydrochloric Acid diluted with Water and the solution filtered ; this is precipitated with a sufficient quantity of stronger Water of Ammonia, and set aside. Carbonate of Sodium, 6 ounces, is dissolved in half a gallon of Water and Sulphate of Iron, 5 ounces, in half a gallon of Water, and the Iron solution added to the Sodium solution, precipitating Oxide of Iron. This mixture is then added to the reserved Calcium mixture, and the precipitate washed as directed, page 44, until free from chlorides and sulphates. The precipitate is then collected, drained and pressed, and while moist dissolved in 5 lbs. av. of Phosphoric Acid, 50 per cent. To this solution add Phosphate of Sodium 6 ounces, and Carbonate of Potassium 3 ounces, and Water sufficient to make 1 gallon.

1939. Solution of Phosphates Compound.

"Acid Phosphate."

Solution Phosphates Compound, concentrated,	1 pint.
Water,	4 pints.
Mix them, and, after standing, filter.	

This solution is similar in composition to a popular proprietary preparation made by the Rumford Chemical Co. of Providence, R. I., and known as "Acid Phosphate." As the manufacturers claim this title as proprietary, druggists are not allowed to put it up or dispense it under this name. Solution of Phosphates Compound is considerably used at the Soda Water counter as an addition to beverages, etc., and is a popular nerve tonic and vitalizer.

1940. Solution "Protoxide" of Iron.

A Solution of Protocitrate of Iron, which is the same as is generally furnished as "Protoxide" of Iron may be made as follows:

Sulphate of Iron, pure crystals, . . .	3 ounces av.
Carbonate of Sodium,	4 ounces av.
Citric Acid,	2 ounces av.
Sugar,	4 ounces av.
Warm Water, a sufficient quantity.	

Dissolve the Iron Salt in half a gallon of warm Water, and the Sodium Salt in half a gallon of warm Water, and add the Iron solution to the Sodium solution. When the precipitate has subsided, wash as directed, page 44, until the washings are tasteless, then drain the precipitate quickly, press it, mix the Sugar with it and dissolve it in 8 fl.ounces of Water, in which the Citric Acid has previously been dissolved; add enough Water if necessary to make the measure 16 fl.ounces, and filter.

Four minims of this solution contains about 1 grain Protocitrate of Iron. It is used in making several Elixirs, Syrups, Solutions, etc.

1941. Solution Pyrophosphate of Iron.

Pyrophosphate of Iron,	4 $\frac{1}{3}$ ounces av.
Glycerin,	4 fl.ounces.
Water of Ammonia, 10 per cent., . .	$\frac{1}{2}$ fl.ounce.
Water, sufficient to make	1 pint.

In 8 fl.ounces of Water heated nearly to boiling, dissolve the Pyrophosphate of Iron by adding it in small portions and stirring until dissolved, then, when cooling, add the Water of Ammonia and the Glycerin, and, lastly, sufficient Water to make the measure 1 pint.

This solution is very convenient to use in place of the Salt, 4 minims being equivalent to 1 grain of Pyrophosphate of Iron. Since the introduction of the soluble Phosphate of Iron (scale salt), Pyrophosphate of Iron is much less used than formerly.

1942. Solution Sulphate of Strychnine.

For combining with Elixirs, Syrups, Solutions, Wines, and like preparations, as well as for general dispensing, a Solution of Strychnine is a great convenience, if not a necessity. The following Solution is well adapted for this purpose :

Sulphate of Strychnine, powdered, . . .	32 grains.
Citric Acid,	8 grains.
Alcohol,	2 fl.ounces.
Water, sufficient to make	4 fl.ounces.

Dissolve the Citric Acid in 2 fl.ounces of hot Water and add the Strychnine salt ; when nearly cool add the Alcohol and then sufficient Water to make the measure 4 fl.ounces.

A fl.drachm of this Solution contains 1 grain Sulphate of Strychnine, therefore a fl.drachm may be used for each grain of Strychnine directed in the formulæ.

Caution.—This solution must only be used for combining with preparations or dispensing in place of Strychnine directed in liquid preparations. Several other Solutions of Strychnine, as Hall's (2038), containing only 1 grain in a fl.ounce, or the Br. Liquor Strychninæ (1920), containing 1 part in 100, are known, and care must be exercised that this Solution is not used instead of them.

Test-Solutions.

The Pharmacopœias designate and give formulas for a variety of Solutions of chemical reagents which are used for testing the various substances mentioned in their pages, and which are known as Test-Solutions.

The following are official in the U. S., Br., and German Pharmacopœias :

Qualitative Test-Solutions.

1943. Test-Solution Acetate of Copper. Br.—Subacetate of Copper of Commerce in fine powder (*Verdigris*) $\frac{1}{2}$ ounce av., Acetic Acid 1 fl.ounce, distilled Water a sufficiency. Dilute the Acid with half a fl.ounce of Water ; digest the Subacetate of Copper in the mixture at a temperature not exceeding 212° F. (100° C.), with repeated stirring, and continue the heat until a

dry residue is obtained. Digest this in 4 ounces of boiling distilled Water, and by the addition of more of the Water make up the Solution to 5 fl.ounces, and filter.

1944. Test-Solution Acetate of Lead. U. S.—Acetate of Lead 1 part, distilled Water 10 parts. Dissolve, and, if necessary to give a faint acid reaction, add a few drops of Acetic Acid.

1945. Test-Solution Acetate of Potassium. Br.—Acetate of Potassium $\frac{1}{2}$ ounce av., distilled Water 5 fl.ounces. Dissolve, and filter.

1946. Test-Solution Acetate of Sodium. Br.—Acetate of Sodium $\frac{1}{2}$ ounce, distilled Water 5 fl.ounces. Dissolve, and filter. The German Solution is made by dissolving 1 part Acetate of Sodium in 4 parts of Water.

1947. Test-Solution of Albumen. U. S.—A Solution recently prepared by triturating the White of one Egg with 100 cubic centimetres of distilled Water, and filtering through cotton moistened with distilled Water. The Br. Solution is the White of one Egg mixed with 4 fl.ounces of distilled Water, and filtered through tow.

1948. Test-Solution Ammonio-Nitrate of Silver. U. S.—A Solution prepared by adding Water of Ammonia in drops to Test-Solution Nitrate of Silver until the precipitate at first formed is very nearly all dissolved, and filtering. The Br. Solution is Nitrate of Silver in crystals $\frac{1}{4}$ ounce av., Solution of Ammonia $\frac{1}{2}$ fl.ounce, or a sufficiency, distilled Water a sufficiency. Dissolve the Nitrate of Silver in 8 fl.ounces of the Water and add Ammonia until the precipitate first formed is nearly dissolved, filter, and add enough distilled Water to make 10 fl.ounces.

1949. Test-Solution Ammonio-Sulphate of Copper. U. S.—Add Water of Ammonia in drops to Test-Solution Sulphate of Copper until the precipitate first formed is nearly all dissolved, and filter. The Br. formula is Sulphate of Copper in crystals $\frac{1}{2}$ ounce av., Solution of Ammonia a sufficiency, distilled Water a sufficiency. Dissolve the Copper salt in 8 fl.ounces of Water, and cautiously add Solution of Ammonia until the precipitate first formed is nearly dissolved, then filter, and add distilled Water to make 10 fl.ounces.

1950. Test-Solution Ammonio-Sulphate of Magnesium. Br.—Sulphate of Magnesium 1 ounce av., Chloride of Ammonium $\frac{1}{2}$ ounce av., Solution of Ammonia $\frac{1}{2}$ fl.ounce, distilled Water a sufficiency. Dissolve the Sulphate of Magnesium and Chloride of Ammonium in 8 ounces of distilled Water, and add the Water of Ammonia and sufficient distilled Water to make 10 fl.ounces.

1951. Test-Solution Bichromate of Potassium. U. S.—Bichromate of Potassium 1 part, dissolved in 10 parts of distilled Water.

1952. Test-Solution Bitartrate of Sodium. U. S.—Bitartrate of Sodium 1 part, dissolved in 10 parts of distilled Water, by the aid of heat, and filtered when cold.

1953. Test-Solution Boric Acid. Br.—Boric Acid 50 grains, dissolved in rectified Spirit 1 fl.ounce, and filtered.

1954. Test-Solution Bromine. Br.—Bromine 10 minims, distilled Water 5 fl.ounces. Place the Bromine in a bottle, pour on the Water and shake several times. Keep closely stopped and from the light.

1955. Test-Solution Carbonate of Ammonium. U. S.—Carbonate of Ammonium 1 part, dissolved in distilled Water 10 parts. The Br. formula is Carbonate of Ammonium $\frac{1}{2}$ ounce, Solution of Ammonia $\frac{3}{4}$ fl.ounce, distilled Water 10 fl.ounces. The German formula is Carb. Ammonium 1 part, Water of Ammonia 1 part, Water 3 parts.

1956. Test-Solution Carbonate of Sodium. G. P.—Prepared by dissolving 1 part of Carbonate of Sodium in crystals in 4 parts of Water.

1957. Test-Solution Chloride of Ammonium. Br.—Chloride of Ammonium 1 ounce av., dissolved in distilled Water 10 fl.ounces, and filtered. The G. P. formula is 1 part to 9 of Water.

1958. Test-Solution Chloride of Barium. U. S.—Chloride of Barium, pure, 1 part, dissolved in distilled Water 10 parts, and filtered. The Br. formula is the same.

1959. Test-Solution Chloride of Calcium. U. S.—Chloride of Calcium, pure, 1 part, dissolved in distilled Water 10 parts, and filtered. The G. P. formula is 1 part to 9 of Water.

1960. Test-Solution Chloride of Gold. U. S.—Chloride of Gold 1 part, dissolved in distilled Water 20 parts.

1961. Test-Solution Chromate of Potassium. U. S.—Chromate of Potassium 1 part, dissolved in distilled Water 10 parts. The German formula is 1 part to 9 of Water.

1962. Test-Solution of Ferric Chloride. U. S.—Ferric Chloride 1 part, dissolved in distilled Water 10 parts, and filtered. The German formula is the official Solution Chloride of Iron.

1963. Test-Solution Ferricyanide of Potassium. U. S.—Ferricyanide of Potassium, pure, 1 part, dissolved in 10 parts of distilled Water. The Br. formula is $\frac{1}{4}$ ounce of the salt in 5 fl.ounces of distilled Water. The German, 1 part to 9 of Water.

1964. Test-Solution Ferrocyanide of Potassium. U. S.—Ferrocyanide of Potassium 1 part, dissolved in distilled Water 10 parts. The Br. formula is $\frac{1}{4}$ ounce of the salt, dissolved in 5 fl.ounces of distilled Water.

1965. Test-Solution Ferrous Sulphate. U. S.—A recently-prepared Solution made by dissolving 1 part of selected clear crystals of Ferrous Sulphate in 10 parts of distilled Water.

1966. Test-Solution of Gelatin. U. S.—Gelatin or Isinglass 1 part, soaked for half an hour in Water, and dissolved in distilled Water 50 parts, by the

heat of a water-bath. The Br. formula for *Solution of Isinglass* is: Isinglass 50 grains, warm, distilled Water 5 fl.ounces, made in the same way.

1967. Test-Solution Hydrosulphuric Acid. U. S.— A saturated Solution of Hydrosulphuric Acid Gas in distilled Water.

1968. Test-Solution Hyposulphite of Sodium. U. S.— Hyposulphite of Sodium 1 part, dissolved in distilled Water 10 parts.

1969. Test-Solution of Indigo. U. S.— A liquid prepared by digesting 1 part of Indigo in powder with 12 parts of Sulphuric Acid on a water-bath for 1 hour, pouring the Solution into 500 parts of Sulphuric Acid, then leaving the mixture to subside and decanting the clear portion to use.

1970. Test-Solution of Iodide of Mercury and Potassium. U. S.— Made by adding 100 parts of Test-Solution of Mercuric Chloride to 367 parts of Test-Solution of Iodide of Potassium.

1971. Meyer's Test-Solution, which is similar to the foregoing, and is frequently referred to in pharmaceutical works, is made by dissolving 49.8 grammes of Iodide of Potassium in 400 cubic centimeters of distilled Water and 13.546 grammes of Corrosive Chloride of Mercury in 500 cubic centimeters of distilled Water, adding the latter solution to the former and enough distilled Water to make 1 litre.

This is the standard Test-Solution or reagent for Alkaloids, which it precipitates, and the percentage of which may be calculated by the quantity of the solution required to precipitate them.

1972. Test-Solution Iodide of Potassium. U. S.— Iodide of Potassium 1 part, dissolved in distilled Water 20 parts. The Br. Solution is 1 to 10, the German 1 to 9.

1973. Test-Solution of Iodine. U. S.— Iodine 1 part, Iodide of Potassium 3 parts, Water 50 parts. Dissolve the Iodide of Potassium in the Water and add the Iodine to the solution.

1974. Test-Solution of Magnesium. U. S.— Sulphate of Magnesium 1 part, Chloride of Ammonium 2 parts, dissolved in 8 parts of distilled Water, and Water of Ammonia 4 parts added to the Solution. Allow to stand two or three days, and filter. The Br. Solution Ammonio-Sulphate of Magnesium (1950) is similar to this but different in proportions.

1975. Test-Solution of Mercuric Chloride. U. S.— Mercuric Chloride 1 part, dissolved in distilled Water 20 parts.

1976. Test-Solution Nitrate of Barium. U. S.— Nitrate of Barium 1 part, dissolved in 20 parts of distilled Water. The G. P. formula is 1 part to 19 of Water.

1977. Test-Solution Nitrate of Silver. U. S.— Nitrate of Silver 1 part, dissolved in distilled Water 20 parts.

1978. Test-Solution Oxalate of Ammonium. U. S.— Oxalate of Ammonium 1 part, dissolved in distilled Water 20 parts. The Br. formula is

Oxalate of Ammonium $\frac{1}{2}$ ounce, dissolved in warm distilled Water 20 fl.ounces (Imperial).

1979. Test-Solution Permanganate of Potassium. U. S.—Permanganate of Potassium 1 part, dissolved in distilled Water 1,000 parts.

1980. Test-Solution Phosphate of Ammonium. U. S.—Phosphate of Ammonium 1 part, dissolved in distilled Water 10 parts.

1981. Test-Solution Phosphate of Sodium. U. S.—Phosphate of Sodium 1 part, dissolved in distilled Water 10 parts. The Br. formula is the same. The G. P. directs 1 part to 19 of Water.

1982. Test-Solution Picric Acid. U. S.—A saturated Solution prepared by dissolving 1 part of Picric Acid in 100 parts of distilled Water, by aid of heat, and filtering after 24 hours.

1983. Test-Solution Platinic Chloride. U. S.—Platinic Chloride 1 part, distilled Water 20 parts. Dissolve, and filter. The Br. formula converts Metallic Platinum into a solution of Perchloride of Platinum.

1984. Test-Solution Potassio-Cupric Tartrate. U. S.—Dissolve $6\frac{93}{100}$ grammes of selected crystals of Sulphate of Copper in 20 cubic centimeters of distilled Water; dissolve 36 grammes of Tartrate of Potassium in 140 cubic centimeters of Solution of Soda, then add the former solution gradually to the latter, with stirring, and finally add sufficient Solution of Soda to make the measure 200 cubic centimetres.

1985. Test-Solution Potassio-Mercuric Iodide. Br.—*Nessler's Reagent.*—Iodide of Potassium 135 grains, Perchloride of Mercury a sufficiency, Caustic Soda 2 ounces av., distilled Water 1 pint (20 ounces Imperial). Dissolve the Iodide of Potassium and 100 grains of Perchloride of Mercury in 15 fl.ounces of boiling distilled Water. To this add more aqueous Solution of Perchloride of Mercury until the precipitate produced no longer continues to disappear on well stirring, and a slight permanent precipitate remains; then add the Caustic Soda. When the latter has dissolved add a little more of the aqueous Solution of Perchloride of Mercury, shake, allow to settle, and dilute the whole with Water to 20 fl.ounces (Imperial). This is used the same as Meyer's Solution as a reagent for alkaloids, etc.

1986. Test-Solution Stannous Chloride. Br.—Granulated Tin 1 ounce av., Hydrochloric Acid 3 fl.ounces, distilled Water sufficient to make 5 fl.ounces. Dilute the Acid in a flask with 1 ounce of Water and apply heat gently until gas ceases to be evolved, then add enough Water to make 5 fl.ounces, leaving the undissolved Tin in the bottle.

1987. Test-Solution Sulphate of Calcium. U. S.—A saturated Solution made by digesting 1 part of powdered native crystallized Sulphate of Calcium with about 300 parts of distilled Water at the ordinary temperature, with repeated agitation for several days, then decanting the clear liquid,

1988. Test-Solution Sulphate of Copper. U. S.—Sulphate of Copper selected crystals 1 part, dissolved in distilled Water 10 parts.

1989. Test-Solution Sulphate of Magnesium. G. P.—Sulphate of Magnesium 1 part, dissolved in Water 9 parts.

1990. Test-Solution Sulphate of Potassium. U. S.—Sulphate of Potassium 1 part, dissolved in distilled Water 15 parts.

1991. Test-Solution Sulphate of Silver. U. S.—Sulphate of Silver 1 part, dissolved in distilled Water 250 parts, by the aid of gentle heat.

1992. Test-Solution Sulphide of Ammonium. U. S.—Made by passing washed Hydrosulphuric Acid Gas into 3 parts of Water of Ammonia until the latter is saturated, then adding 2 parts of Water of Ammonia. The Br. Solution Sulphydrate of Ammonium is the same.

1993. Test-Solution Sulphite of Sodium. G. P.—Dissolve 1 part of the Salt in 9 parts of Water.

1994. Test-Solution Tannic Acid. U. S.—Tannic Acid 1 part, dissolved in 9 parts of Water and 1 part of Alcohol. The G. P. directs 1 part of Tannic Acid to 19 of Water.

1995. Test-Solution Tartaric Acid. U. S.—Tartaric Acid 1 part, dissolved in distilled Water 5 parts. The G. P. directs 1 part to 4 parts of Water. The Br. formula is Tartaric Acid 1 ounce av., distilled Water 8 fl.ounces, Rectified Spirit 2 fl.ounces.

1996. Test-Solution Yellow Chromate of Potassium. Br.—Red Chromate of Potassium 295 grains, Bicarbonate of Potassium 200 grains, distilled Water 10 fl.ounces. Dissolve the Red Chromate of Potassium in the Water and exactly neutralize the solution with the Bicarbonate evolution of all Carbonic Acid, being insured by ebullition, then filter.

1997. Tincture of Phenol-Phthalein. Br.—Phenol-phthalein 1 grain, Proof Spirit 100 grains. Dissolve.

Volumetric Solutions.

Volumetric Solutions are used for determining the quantity of a chemical salt contained in a given quantity of a solution. They are used for quantitative chemical analysis only, the ordinary test solutions being sufficient for qualitative analysis and the general uses of the pharmacist. As the U. S., Br., and Gr. formulas are nearly the same, the U. S. only will be given. For the equivalents of these solutions refer to the Pharmacopœia.

1998. Volumetric Solution Bichromate of Potassium.—Bichromate of Potassium 14.75 grammes, distilled Water, a sufficient quantity to make 1000 cubic centimeters, or 1 litre. Dissolve the Bichromate of Potassium in about

700 cubic centimeters of distilled Water, then add of the latter enough to make the solution measure 1000 cubic centimeters.

1999. Volumetric Solution Hyposulphite of Sodium.—Hyposulphite of Sodium 32 grammes, Volumetric Solution of Iodine 100 cubic centimeters, distilled Water, a sufficient quantity to make 1000 cubic centimeters. Dissolve the Hyposulphite of Sodium in enough distilled Water to make the solution measure 1000 C.c. To the Volumetric Solution of Iodine (which should measure exactly 100 C.c.) add a sufficient quantity of the Solution of Hyposulphite of Sodium, from a burette, nearly to decolorize the Iodine Solution, then add freshly gelatinized starch and continue the addition of the Hyposulphite until the blue color of the mixture is just destroyed, noting the number of cubic centimeters added. Then take of the Solution of Hyposulphite of Sodium ten times this number of cubic centimeters, and add thereto enough distilled Water to make the solution measure 1000 cubic centimeters.

2000. Volumetric Solution of Iodine.—Iodine 12.66 grammes, Iodide of Potassium 18 grammes, distilled Water a sufficient quantity to make 1000 cubic centimeters. Dissolve the Iodide of Potassium in about 700 cubic centimeters of distilled Water; in this solution dissolve the Iodine and add enough distilled Water to make the solution measure 1000 cubic centimeters.

2001. Volumetric Solution Nitrate of Silver.—Nitrate of Silver, well crystallized and dry, 16.97 grammes, distilled Water a sufficient quantity to make 1000 cubic centimeters. Dissolve the Nitrate of Silver in about 700 parts of distilled Water and add enough of the latter to make the solution measure 1000 cubic centimeters.

2002. Volumetric Solution of Oxalic Acid.—Oxalic Acid in perfect crystals 63 grammes, distilled Water a sufficient quantity to make 1000 cubic centimeters. Dissolve the Oxalic Acid in about 700 cubic centimeters of distilled Water and add of the latter enough to make the solution measure 1000 cubic centimeters.

2003. Volumetric Solution of Soda.—Oxalic Acid in perfect crystals 6.3 grammes, Solution of Soda, Distilled Water, of each a sufficient quantity. To the Oxalic Acid, add from a burette enough Solution of Soda exactly to neutralize the Acid, as indicated by the color of litmus, and note the number of cubic centimeters of Solution of Soda required. Take 10 times this number of cubic centimeters of the same Solution of Soda and add thereto enough distilled Water to make the solution measure 1000 cubic centimeters.

Other Solutions.

Besides the Solutions for which the formulæ have been given in the preceding sections, quite a number are known and

used which cannot well be included in the classes named, and are therefore given under this heading :

2004. Solution Albuminate of Iron.—Dried Egg Albumen, soluble, 1 ounce av., dissolve in Water 7 fl.ounces and add to the Solution 75 grains crystallized Chloride of Iron dissolved in 3 fl.ounces of Water, then add to the Solution 2 fl.ounces of Alcohol mixed with 4 fl.ounces of Glycerin, and mix them well together. By omitting the Glycerin and Alcohol this Solution may be evaporated by gentle heat to a thick syrup, which may be spread on glass and obtained in the form of a scale salt *Albuminate of Iron*. See, also, Albuminate of Iron and Sodium (syrups).

2005. Battery Solutions or Fluids.—The Solution most commonly used for batteries of Zinc and Copper, which are called *Gravity Batteries*, is a Solution of Sulphate of copper (Blue Vitriol) in Water, sufficient of the salt being used to leave a small portion undissolved in the bottom of the jar. The batteries with Carbon and Zinc plates, known as *High Resistance Batteries*, are charged with a *Battery Fluid* made with Bichromate of Potassium 1 part, Sulphuric Acid 2 parts by weight, Water 10 parts, the Zincs being amalgamated with Mercury. The *Leclanché Battery*, which has a porous cup filled with Carbon, and a Zinc anode, is charged with a Solution of Chloride of Ammonium about 1 part to 4 parts of Water. *Small Batteries*, for medicinal use, are usually made with Copper and Zinc and charged with a Solution of Sulphate of Mercury. Platinum Batteries are charged with the same, some Mercury being left in the bottom of the jar, which keeps the Zincs amalgamated. Many other kinds of batteries are known and used, but these mentioned are the most common.

2006. Disinfecting Solutions.—To give formulas for all the Disinfecting Solutions which have been used would require a volume. We can, therefore, only mention those which have been best known and have most merit. The formulas for many of them are given under other headings, as Solution of Chlorinated Lime, Solution of Chlorinated Soda, Solution Chloride of Zinc, etc., nearly all having in them free or combined Chlorine, which is considered the best available disinfectant.

2007. Solution Bromo-Chloralum.—Under the name Bromo-Chloralum, put up by Tilden & Co., a Solution for disinfecting, etc., is well known. A similar preparation may be made as follows : Alum 11 ounces av., Carbonate of Sodium (Sal Soda) 10 ounces av., Bromide of Potassium 8 ounces av., Hydrochloric Acid a sufficient quantity, Water sufficient to make a gallon. Dissolve the Alum in 6 pints of boiling Water and add the Carbonate of Sodium to the Solution, which precipitates Hydrate of Aluminium; add to the mixture sufficient Hydrochloric Acid to dissolve the precipitate, then dissolve the Bromide of Potassium in the Solution, and, if necessary, add sufficient Water to make the measure 1 gallon.

2008. Condy's Fluid or Solution.—A Solution of Permanganate of Potassium, made by dissolving $\frac{1}{2}$ ounce Permanganate of Potassium in 1

gallon of Water. By using the crude salt a very cheap and efficient disinfectant may be made. This Solution is also a valuable wash for foul ulcers and sores.

2009. Coutaret's White Fluid or Solution.—Sulphate of Zinc $1\frac{1}{8}$ ounce av., Water sufficient to make a pint.

2010. Darby's Prophylactic Fluid or Solution.—Permanganate of Potassium 5 grains, Sulphate of Potassium 150 grains, Carbonate of Potassium $1\frac{3}{4}$ ounce av., Chloride of Potassium $\frac{1}{4}$ ounce av., Water sufficient to make a pint.

2011. De Wessely's Disinfecting Solution.—Sulphate of Iron 1 ounce av., Chloride of Iron $3\frac{1}{8}$ ounces av., Chloride of Zinc $1\frac{1}{8}$ ounce, Water sufficient to make a pint.

2012. Farwell's Disinfectant Solution.—Sulphate of Iron $2\frac{1}{8}$ ounces av., Carbolic Acid 5 drachms, Water sufficient to make a pint.

2013. Girondin Disinfectant Solution.—Sulphate of Zinc $4\frac{1}{8}$ ounces, Sulphate of Copper $\frac{1}{4}$ ounce, Sulphate of Lime $\frac{1}{3}$ ounce, Water sufficient to make a pint.

2014. Grantville Carbolic Alkali.—Carbolic Acid $\frac{3}{4}$ ounce, Caustic Potassa 150 grains, Water sufficient to make a pint.

2015. Le Doyen's Disinfectant Solution.—Nitrate of Lead $2\frac{1}{8}$ ounces av., Water sufficient to make a pint.

2016. Mattenheimer's Disinfecting Fluid.—Sulphate of Iron 1 ounce, Carbolic Acid 7 drachms, Water, sufficient to make a pint.

2017. Monsell's Disinfecting Solution.—Solution of Subsulphate of Iron 8 fl.ounces, Nitrate of Iron $2\frac{1}{2}$ ounces, Water, sufficient to make a pint.

2018. Phenol Sodique.—Carbolic Acid $1\frac{1}{8}$ ounce, Caustic Soda, sufficient to neutralize, about $\frac{1}{2}$ ounce, Water, sufficient to make a pint. A cheaper Phenol Sodique may be made by using Crude Carbolic Acid.

2019. Seeley's Disinfecting Solution.—Sulphate of Manganese $2\frac{1}{8}$ ounces av., Sulphate of Iron 1 ounce av., Sulphuric Acid $1\frac{3}{8}$ ounce av., Muriatic Acid $\frac{1}{4}$ ounce av., Water, sufficient to make a pint.

2020. Dobell's Solution — For Nasal Catarrh.—Bicarbonate of Sodium 120 grains, Borax 120 grains, Carbolic Acid 90 grains, Glycerin 2 fl.ounces, Water, sufficient to make 2 pints. Mix and dissolve.

2021. Fehling's Solution — A test reagent for Glucose.—This may be made by dissolving 80 grains of Sulphate of Copper in 1 fl.ounce of distilled Water, and 532 grains of Rochelle Salt in 4 fl.ounces of Solution of Soda. These two solutions are to be kept separate, and when the reagent is to be used pour the solution of Sulphate of Copper into the solution of Rochelle Salt, add sufficient distilled Water to make the whole measure 6.8 fl.ounces,

and filter. Solutions containing Glucose or Grape-Sugar give a brown precipitate (Cuprous Oxide) when boiled with this solution.

2022. Solution Iodo-Bromide of Calcium Compound.—This solution as known in the market is a proprietary preparation put up by Tilden & Co. Its analysis shows it to be the mother liquor or *Bittern* left after the crystallization of salt from natural salt water obtained from salt wells. It is directed to be used externally, but is also used in making the elixir Iodo-Bromide of Calcium Compound as directed (546).

A solution of Iodide and Bromide of Calcium Compound may be made by dissolving Iodide of Calcium 1 ounce av., Iodide of Potassium 1 ounce av., Bromide of Calcium 1 ounce av., Bromide of Potassium 1 ounce av., Bromide of Sodium $\frac{1}{2}$ ounce av., in sufficient Water to make a pint.

2023. Lugol's Rubefacient Solution of Iodine.—Iodine $\frac{1}{2}$ ounce av., Iodide of Potassium 1 ounce av., Water 6 fl.ounces. Dissolve the Iodide in the Water and add the Iodine. This is for external use.

2024. Lugol's Caustic Solution of Iodine.—Iodine 1 ounce av., Iodide of Potassium 1 ounce av., Water 2 fl.ounces. Dissolve the Iodide in the Water and add the Iodine. This is applied as a caustic for indolent sores, ulcers, etc.

2025. Javelle's Solution or Javelle's Water—*Eau de Javelle*.—For removing fruit stains, etc. This is similar to Labarraque's Liquor or Solution, except that Carbonate of Potassium is used for preparing it instead of Carbonate of Sodium.

2026. Solution Opium Compound, Squibbs.

Liquor Opii Compositus—*Depurated Solution of Opium Compound*.

Opium,	1 $\frac{1}{2}$ ounces av.
Acetic Ether,	512 minims.
Ether (Sulphuric),	4 fl.ounces.
Chloroform,	256 minims.
Alcohol,	7 fl.ounces.
Water, q. s., or,	24 fl.ounces.

Pour half a pint of boiling Water on the Opium, rub it to a pulpy mass, and after 24 hours express the liquid and reserve, repeat the operation twice with the same quantity of boiling Water, mix the expressed liquids and evaporate to 8 fl.ounces. When cool, add the Ether and shake frequently during 24 hours, to deodorize the solution, then pour off the Ether as much as possible, or separate it from the solution with a separating funnel or perforated cork, placed in the neck of the funnel, and evaporate all traces of Ether from the liquid, filter the 7 $\frac{1}{2}$ ounces remaining, and having mixed the Alcohol, Chloroform, and Acetic Ether, add them to the filtered solution to make a pint. This is the same strength of Opium as Tincture Opium.

2027. Solution of Opium, Sedative, Battley's.*Liquor Opii Sedativus, Battley's. Battley's Sedative Solution.*

Aqueous Extract of Opium, hard,	3	ounces av.
Rectified Spirit,	6	fl.ounces.
Water, a sufficient quantity to make	38½	fl.ounces.

Break up the Extract of Opium, and boil it with 30 fl.ounces of water until dissolved, when cool add to the solution the Rectified Spirit and sufficient water to make the measure 38½ fl.ounces, and filter.

If the Extract of Opium used is soft it is necessary to use a proportionate quantity, from 3½ to 4 ounces being required according to the consistence of the Extract.

This solution is about 30 per cent. stronger than Tincture of Opium, and is claimed to be superior to it as some of the objectionable principles of Opium are removed.

2028. Liquor of Opium is another name for Acetum Opii or Black Drop (20 and 21).

2029. Liquor Opii Hydrochloricus, or *solution Muriate of Opium* is made with Powdered Opium, 1½ ounce av., Distilled Water, 20 fl.ounces, Hydrochloric Acid, 1½ fl.ounce. Digest for two weeks, agitating daily and filter. It is about the same strength as Tincture Opium, and does not contain some of the objectionable principles of Opium.

Liquor Opii Citratis is made in the same manner, except that Citric Acid is used instead of Hydrochloric.

2030. Solution Per-Oxide of Hydrogen.—This solution is most conveniently made by decomposing 1 part of Dioxide of Barium with 2 parts of Hydrochloric Acid, Chloride of Barium precipitates leaving Hydrogen Dioxide (or Per-oxide) in solution. The solution is not very stable. It is chiefly used for bleaching hair, which can be made of a golden or blonde color by applying it. It is seldom made except by manufacturing chemists, and as found in the market will yield from 10 to 20 volumes oxygen gas for each volume of the solution.

2031. Solution Phosphorus, Thompson's.

Phosphorus, not oxidized,	1	grain.
Absolute Alcohol,	5	fl.drachms.
Glycerin,	1½	fl.ounces.
Alcohol,	2	fl.drachms.
Spirit of Peppermint,	40	minims.

Dissolve the Phosphorus in the Absolute Alcohol, contained in a well stopped bottle, by the aid of gentle heat, and having mixed and warmed the Glycerin, Alcohol and Spirit of Peppermint to about 150° F., add them to the solution, agitating them well together. The solution should be kept

closely stopped in a dark place. A fl.drachm contains $\frac{1}{33}$ grain of Phosphorus. The dose is 20 minims or more.

2032. Solution Phosphorus Compound.

Phosphorus Bromine and Iodine.

Phosphorus,	10 grains.
Bromine,	170 grains.
Iodine,	170 grains.
Alcohol,	1 fl.ounce.
Glycerin, sufficient to make	8 fl.ounce.

Dissolve the Iodine in the Alcohol and add the Solution to the Glycerin, then add the Bromine a little at a time, and when combined with the Solution add the Phosphorus, in small portions, keeping the bottle well stopped during its solution. The Phosphorus should be added in fine shavings kept under water until used, and great care must be used in adding it, as the action is violent. This solution is used in making some syrups, wines, etc.

2033. Solutions for Plating.—For electro-plating with silver, nickel, gold, etc., it is necessary to use batteries to generate the electrolytic action, and deposit the metals from their solutions upon the surfaces which are to be plated. The details of the processes are too voluminous to be repeated here, and the solutions from which the metal is deposited can only be briefly mentioned.

Silver-Plating Solution. This may be made with Cyanide of Potassium, 4 ounces av., Cyanide of Silver, $1\frac{1}{4}$ ounce av., Water, 160 fl.ounces.

Gold-Plating Solution. This may be made with Cyanide of Potassium, 1 pound av., Cyanide of Gold, $\frac{1}{132}$ ounce av., Water, 160 fl.ounces.

Nickel-Plating Solution. This may be made with double Salts of Nickel (Sulphate of Nickel and Ammonium), 4 ounces, Water, 160 fl.ounces.

Many other Plating Solutions are used, and the metal is deposited in various ways on different articles.

Plate Liquor is intended to brighten and increase the luster of plated-ware. It is made by dissolving 1 ounce each of Alum, Cream of Tartar and Salt, in 80 fl.ounces of Water. The articles are to be boiled in the Liquor.

2034. Solutions for Preserving Fruit, etc.—Salicylic Acid 1 ounce av., Boric Acid 4 ounces av., Water 10 pints. Dissolve the salts in the Water by the aid of heat.

Use 2 ounces of this Solution for each quart of fruit which it is desired to put up, adding sugar, etc., in the regular way. This Solution may be used for all soft fruits, berries, etc.

Vegetable Preserving Solution.—Salicylic Acid 1 ounce av., Boric Acid 4 ounces av., Rock Salt 8 ounces, Alum 1 ounce, Water sufficient to make 10 pints. Mix and dissolve by the aid of heat.

Use 3 ounces of this Solution for each quart of corn, peas, beans, or other vegetables desired to be preserved, cooking them as usual before canning.

Pickle Preserving Solution.—For preserving pickles in casks: Cider Vinegar 10 gallons, Rock Salt 10 pounds, Alum, in powder, $\frac{1}{2}$ pound, Capsicum 2 ounces, Cloves 1 ounce, Salicylic Acid 1 ounce. Mix and dissolve.

Wash the cucumbers thoroughly and pack them in the cask until nearly full, then add sufficient of the Solution to cover them thoroughly.

2035. Silvering Solution.—For silvering the inside of glass vessels, vases, etc., the following Solution is used:

No. 1.—Distilled Water 12 fl.ounces, Rochelle Salt 12 grains, Nitrate of Silver 16 grains. Dissolve the Rochelle Salts in the Water and heat to boiling, then add the Nitrate of Silver dissolved in 1 ounce of distilled Water and continue the boiling for 10 minutes, adding enough distilled Water, when cold, to make the measure 12 fl.ounces.

No. 2.—Distilled Water 10 fl.ounces, Nitrate of Silver 1 ounce, Water of Ammonia a sufficient quantity, Alcohol 1 fl.ounce. Dissolve the Silver Salt in the Water and add enough Water of Ammonia to nearly, but not quite, dissolve the precipitate first formed; lastly, add the Alcohol, and distilled Water enough to make the measure 12 fl.ounces.

Allow the Solutions to stand several days, then mix equal parts of each, and pour into the glass vessels desired to be silvered, or, for making mirrors, lay glass flat on the surface of the Solution.

2936. Soldering Solution.—Hydrochloric Acid 5 fl.ounces, Zinc, in small pieces, a sufficient quantity, Sal Ammoniac 1 ounce av. Add the Zinc to the Acid until nearly all has dissolved that will, then add the Sal Ammoniac and heat to a simmer for five minutes. For making Solder flow freely.

2037. Solution of Salicylate of Sodium.

Salicylic Acid,	1 ounce av.
Bicarbonate of Sodium,	$\frac{3}{4}$ ounce av.
Alcohol,	4 fl.ounces.
Glycerin,	4 fl.ounces.
Water, sufficient to make	1 pint.

Mix the Salicylic Acid with 6 fl.ounces of Water, in a capacious bottle, and add the Bicarbonate of Sodium in portions. When effervescence has ceased and the salts are dissolved add the Alcohol and Glycerin and enough Water to make the measure a pint.

This Solution is given for rheumatism, gout, etc., in doses of a teaspoonful to a tablespoonful.

2038. Solution of Strychnine, Hall's.

Sulphate of Strychnine, in crystals,	16 grains.
Alcohol,	8 fl.ounces.
Water,	$7\frac{1}{2}$ fl.ounces.
Diluted Sulphuric Acid, q. s., or	$\frac{1}{2}$

Rub the Strychnine salt to a fine powder and then, with the Alcohol, add the Water to the Solution, and then the diluted Sulphuric Acid $\frac{1}{2}$ ounce or

sufficient to make a perfectly clear Solution without precipitation, and Water, if necessary, to make the Solution measure a pint.

A fl.ounce of this Solution contains 1 grain of the Strychnine salt. It is a very convenient Solution for prescribing and for dispensing purposes, but is not generally used for combining with elixirs, etc., the stronger Solution Sulphate of Strychnine (1942), 1 grain in a fl.drachm, being generally used for this purpose.

2039. Solution of Sulphurated Lime.—This Solution is made by boiling together in a porcelain vessel for one hour sublimed Sulphur $3\frac{1}{2}$ ounces av., Lime 7 ounces av., Water 2 pints, stirring and adding Water occasionally to preserve the volume. The vessel is then removed from the fire and set aside for the sediment to subside; the clear Solution is then poured off.

It is used as an application or wash for itch and other similar parasites in the skin.

2040. Solution of Tar or Pitch, Alkaline.—Purified Tar 2 parts, Caustic Potassa 1 part, Water 7 parts. Mix and stir frequently for 24 hours, then let it settle and pour off the clear Solution from the sediment.

It is used externally like tar.

2041. Solution Tartar Emetic.—Tartar Emetic 30 grains, Alcohol 4 fl.ounces, boiling Water 12 fl.ounces. Dissolve the salt in the Water and when cool add the Alcohol and sufficient Water to make a pint. This is the same strength as Wine of Antimony, but preferable to it, as the salt is not precipitated by the astringent properties of the wine.

2042. Solution of Tin—*Solution of Muriate or Chloride of Tin, Tin Liquor, Cochineal Compound, Madder Compound.*—This may be made by dissolving granulated Tin 1 pound av., in a mixture of commercial Muriatic Acid 5 pounds, commercial Nitric Acid 1 pound, with Water sufficient to make a gallon.

It may also be made by dissolving crystallized Chloride of Tin 1 pound in a mixture of commercial Hydrochloric Acid $1\frac{1}{2}$ pound av. with Water sufficient to make a gallon. This Solution is used as a mordant in dyeing.

LITHIUM.

Symbol, Li., Atomic weight, 7; sp. gr., 0.589.

Lithium is the lightest of all the known metals, and belongs to the alkaline group, being similar to Potassium and Sodium, although not so ready as they are to combine with Oxygen. It was first obtained by Sir H. Davy, by exposing Hydrate of

Lithium in contact with Mercury to galvanic action, and decomposing the amalgam thus formed by distilling off the Mercury, leaving the metallic Lithium. It is white, and fuses at 356° F.

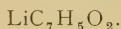
Lithium forms chemical combinations with the Acids and the Haloid Elements, several of which are official, the salts being used chiefly for kidney troubles and rheumatism.

The following are the official Salts of Lithium.

2043.

Lithii Benzoas.

Benzoate of Lithium.



The U. S. P. does not give a formula for this Salt, but it may be made conveniently by Shuttleworth's process: Carbonate of Lithium 1 ounce av. is mixed in a capsule with 9 fl. ounces of Water and heated, then $3\frac{3}{4}$ ounces av., of Benzoic Acid is added in small portions and the heat continued until the Carbonate of Lithium is decomposed and effervescence has ceased. The solution is then filtered, concentrated by evaporation, and crystallized or evaporated to dryness on a water-bath.

Uses.—This Salt is a favorite remedy with physicians for gout and rheumatism. The dose is 15 to 20 grains.

2044.

Lithii Bromidum.

Bromide of Lithium.



This is official in the U. S. P., and may be made by dissolving Carbonate of Lithium to saturation in Hydrobromic Acid, or by decomposing a solution of Bromide of Potassium with a solution of Sulphate of Lithium. It is also prepared in other ways, but is seldom made except by manufacturing chemists.

Uses.—Bromide of Lithium is employed as a hypnotic, especially in rheumatic affections. It is one of the most efficient of Bromides. The dose is from 15 to 30 grains.

2045. Lithii Carbonas.*Carbonate of Lithium.*

This Salt is official in the U. S., Br., and German Pharmacopœias. It may be most readily prepared by decomposing a strong solution of Sulphate of Lithium with a strong solution of Carbonate of Ammonium, Carbonate of Lithium being precipitated, which is washed with a little Alcohol and dried. It resembles Carbonate of Magnesium. In a commercial way it is obtained by fusing the mineral Lepidolite with Carbonate of Barium, Sulphate of Barium and Sulphate of Potassium, and then separating the Potassium and Lithium Sulphates which rise to the surface by lixivation, and preparing the Carbonate from them as above.

Uses.—This is used as the basis for preparing most of the Lithium Salts, and is given in doses of 2 to 10 grains, and used as an injection suspended in mucilage water, for urinary calculi.

2046. Lithii Citras.*Citrate of Lithium.*

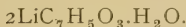
This Salt is official in the U. S. and British Pharmacopœias, the latter giving the following formula :

Carbonate of Lithium,	50 grains.
Citric Acid,	90 grains.
Warm Distilled Water,	1 fl.ounce.

Dissolve the Citric Acid in the Water, and add the Carbonate of Lithium in successive portions, applying heat until effervescence ceases and a perfect solution is obtained. Evaporate by a steam or sand bath, until the product has a specific gravity of about 1.230 and set aside for crystals to form. Dry the crystals and preserve them in a stoppered bottle.

Uses.—The Citrate of Lithium is a soluble salt, convenient for using in solutions, etc. The dose is 15 to 20 grains.

2047.

Lithii Salicylas.*Salicylate of Lithium.*

This is official in the U. S. P., and is conveniently prepared by adding to 1 fl.ounce of Water 60 grains of Carbonate of Lithium, and then heating to boiling and gradually adding 220 grains of Salicylic Acid, and continuing the heat until effervescence ceases, then filtering and evaporating to dryness on a water-bath.

Uses. This is used for gout, rheumatism, etc., in doses of 20 to 40 grains. It seems to be more effective than other salicylates for this use.

Other Lithium Salts.

The foregoing official Lithium Salts are all that are used to any extent in medicine, but the following are known and sometimes called for:

2048. Borocitrate of Lithium.—Citric Acid, 10 parts, Lithium Carbonate, 2 parts, Boric Acid, 3 parts, dissolved together in boiling water and carefully evaporated to dryness and crystallized.

2049. Chloride of Lithium, LiCl.—Dissolve Carbonate of Lithium to saturation in Hydrochloric Acid, concentrate the solution by evaporation and crystallize.

2050. Diborocitrate of Lithium.—Citric Acid, 20 parts, Carbonate of Lithium, 7 parts, Boric Acid, 12 parts. Dissolve in boiling water and evaporate carefully to a dry powder.

2051. Iodide of Lithium, LiI.—Add Carbonate of Lithium to a solution of Iodide of Calcium until no more will dissolve when heated, then filter, concentrate and crystallize.

2052. Nitrate of Lithium, LiNO₃.—Dissolve Carbonate of Lithium to saturation in Nitric Acid, concentrate the solution and crystallize.

2053. Oxide of Lithium is an Alkaline Earth, found in petalite, and in solution in many mineral waters.

2054. Phosphate of Lithium, Li₃PO₄.—This may be made by dissolving Carbonate of Lithium to excess in Phosphoric Acid, concentrating the solution and crystallizing.

2055. Sulphate of Lithium, $\text{Li}_2\text{SO}_4 \cdot \text{H}_2\text{O}$. — Dissolve Carbonate of Lithium to saturation in Sulphuric Acid, concentrate and crystallize.

Many other Salts of Lithium may be made with other acid in the same manner as the foregoing.

2056. Effervescing Citrate of Lithium is made by mixing Citric Acid, 4 parts, with Bicarbonate of Sodium, 5 parts, and Bicarbonate of Lithium, 1 part, and heating together in a flat vessel to about 100°C ., stirring continually until granulated, then sifting through proper size sieves.

LOTIONES — LOTIONS.

Lotions are preparations intended to be applied externally for various purposes, and consisting of medicinal substances mixed with, dissolved or suspended in water, or other aqueous vehicles. A great number of Lotions were formerly known and used in medicine, but since the introduction of Glycerites, Oleates and other like preparations, by which the medicinal ingredients are more effectively applied, they have mostly gone out of use. Formulæ will therefore be given for a few only of those best known and most liable to be called for. The two first given are official in the Br. P. Many of the liniments and solutions are frequently called Lotions. Other Lotions will be found under Toilet Preparations, etc.

2057. Lotio Hydrargyri Flava. Br.

Yellow Mercurial Lotion — Yellow Wash — Aqua Phagedænica — Lotio Flava.

Perchloride of Mercury (Corrosive Sublimate), . . . 18 grains.

Solution of Lime (Lime Water), 10 fl.ounces.

Mix them. This is used as a wash for syphilitic sores, ulcers, etc.

2058. Lotio Hydrargyri Nigra.

Black Mercurial Lotion — Black Wash — Lotio Nigra.

Subchloride of Mercury (Calomel), 30 grains.

Solution of Lime (Lime Water), 10 fl.ounces.

Mix them. By adding 30 grains of powdered Acacia, this is greatly improved. This wash is applied on lint to syphilitic sores, ulcers, etc., and is frequently used as an injection for venereal diseases.

2059. Bateman's Lotion.—Corrosive Chloride of Mercury, 6 grains, Compound Spirit of Lavender, 3 fl.ounces. Dissolve, and add Water, 12 fl.ounces. Used for skin diseases.

2060. Fuller's Leg Wash.—Acetic Acid, 1 fl.ounce, Sal Ammoniac, $\frac{1}{2}$ ounce av., Tincture of Aconite Root, 2 fl.ounces, Tincture of Asafetida, $\frac{1}{2}$ fl.ounce. Mix and dissolve. A teaspoonful to a tablespoonful of this solution is used in a pint of water for washing horse's legs before or after racing.

2061. Gowland's Lotion.—Jordan or Sweet Almonds, 1 ounce, Bitter Almonds, $\frac{1}{2}$ ounce. Soak them in water, remove the skin and mash them to a pulp in a mortar, add water by trituration to make a pint of emulsion. Add to this Corrosive Chloride of Mercury, 15 grains, dissolved in 4 fl.ounces of Alcohol, and 2 fl.ounces of Glycerin, and mix them well together.

This is different than the original formula, by the addition of Alcohol as a preservative and Glycerin as an emollient. It is a fine cosmetic for the complexion, to remove sunburn, tan, freckles, etc., and is useful for skin diseases.

2062. Granville's Milder Lotion.—Stronger Water of Ammonia, 4 fl.ounces, Spirit of Rosemary, 3 fl.ounces, Spirit of Camphor, 1 fl.ounce. Mix them. This is used as a stimulating lotion.

2063. Granville's Stronger Lotion.—Stronger Water of Ammonia, 5 fl.ounces, Spirit of Rosemary, 2 fl.ounces, Spirit of Camphor, 1 ounce.

This is also used as a stimulating Lotion, but is much stronger than the preceding.

2064. Hemorrhoidal Lotion.—Solid Extract of Stramonium, 120 grains, Tincture of Iodine, 2 fl.drachms, Glycerin, 8 fl.ounces, Water, 8 fl.ounces, powdered Golden Seal, 1 ounce, Tannin, 120 grains. Heat the Glycerin and Water and digest all, except the Tincture of Iodine, in the mixture for 6 hours, at a heat of not more than 175° F. Then filter, add enough water through the filter to make a pint of the filtrate, and mix with it the Tincture of Iodine. This is an excellent application for piles.

2065. Kirkland's Lotion or Lotion of Myrrh.—Tincture of Myrrh, 4 fl.ounces, Solution of Lime (Lime Water), 4 fl.ounces. Mix them. This is used for ulcers, spongy gums, etc.

Compound Myrrh Lotion.—Honey of Roses, 2 fl.drachms, Tincture of Myrrh, 2 fl.drachms, Lime Water, 2 $\frac{1}{2}$ fl.ounces. This is used as a dentifrice, etc.

2066. Moth and Freckle Lotion.—Bichloride of Mercury (Corrosive Sublimate), 60 grains, Chloride of Ammonium (Sal Ammoniac), 240 grains, Alcohol, 2 fl.ounces, Rose Water or Orange Flower Water, 2 fl.ounces. Rub the Corrosive Sublimate to a fine powder and dissolve it in the Alcohol. Dissolve the Chloride of Ammonium in the Water. Mix the solutions, add

the Rose Water, and after standing a day or two filter. This may be applied once or twice daily, with a soft sponge, allowing it to dry on the skin.

2067. Palmer's Lotion. — Corrosive Chloride of Mercury, 8 grains, Alum, 12 grains, Water, a pint. Dissolve the salts in the water. This is used as an application for skin diseases, cuts, sores, etc., and is sometimes employed as a cosmetic.

MAGNESIUM.

Symbol, Mg.; atomic weight, 24; sp. gr., 1.743.

The metallic element Magnesium was first discovered by Sir H. Davy in 1808, but was not isolated in a sufficient quantity for examination until 1830, when Bussy examined it and established its characteristics.

It may be obtained commercially by heating to redness a mixture of Chloride of Magnesium, 6 parts, with fused Chloride of Sodium 1 part, Fluoride of Calcium 1 part, and Sodium, in slices, 1 part.

To prepare it chemically pure requires particular manipulation. It is furnished for laboratory use in the form of a ribbon.

Magnesium in metallic form is used for making the brilliant *Magnesium Light* when acted upon by the oxy-hydrogen jet, and is the basis of all the Magnesium salts, which resemble those of Calcium and Barium, and form an important portion of the crust of the earth.

The salts of Magnesium are considerably used in pharmacy and medicine. The following are the official salts:

2068. **Magnesia.**

Light Magnesia—*Calced Magnesia*—*Oxide of Magnesium*
—*Magnesia Levis.*

MgO.

This is made by heating Light Carbonate of Magnesium in a crucible to a low red heat until its carbon dioxide and water are expelled, or until a small portion, taken from the centre of the crucible and moistened with water, causes no

effervescence when dropped into warm diluted Sulphuric Acid.

Uses.—In pharmacy Magnesia is used for making some other preparations and given in doses of 10 to 30 grains as an antacid and laxative. It is usually called for and sold as Calcined Magnesia.

2069. Magnesia Ponderosa.

Heavy Magnesia — Heavy Calcined Magnesia.

MgO.

This is the same chemically as the foregoing, but an equal weight is only about one fourth as bulky, It is prepared from Heavy Carbonate of Magnesium in precisely the same manner as the Light Magnesia.

Husband's Magnesia and *Henry's Magnesia* are simply Heavy Magnesia put up in proprietary form and sold at a fancy price.

Uses.—Heavy Magnesia is used for the same purposes as Light Magnesia, but is more convenient on account of being less bulky. The dose is 10 to 30 grains or more.

2070. Magnesia Carbonas.

Carbonate of Magnesium.

$(\text{MgCO}_3)_3\text{Mg}(\text{HO})_2 \cdot 4\text{H}_2\text{O}$.

The U. S. P. gives no formula for this preparation, but the Br. P. gives two processes, one for making *Magnesii Carbonas Levis* or Light Carbonate of Magnesia, the other for making *Magnesii Carbonas Ponderosa* or Heavy Carbonate of Magnesium, the latter being generally used in pharmacy.

The proportions of both are the same, varying only in the manner of making.

Heavy Carbonate of Magnesium, Br.

Sulphate of Magnesium, 10 ounces av.

Carbonate of Sodium, 12 ounces av.

Boiling Distilled Water, a sufficiency.

Dissolve the Sulphate of Magnesium and the Carbonate of Sodium each in 20 ounces of the Water, mix the two solutions

and evaporate the whole to perfect dryness by means of a sand-bath. Digest the residue for half an hour with 2 pints (Imperial) of Water, and, having collected the insoluble matter, wash it repeatedly with distilled Water until the washings no longer give a precipitate with Chloride of Barium. Finally, dry the product at a temperature not exceeding 212° F. (100° C.).

As prepared for the market this powder is pressed while still moist in bricks or squares of 2 or 4 ounces or less.

Light Carbonate of Magnesia is made with the same ingredients, in the same proportion, but the salts are dissolved each in half a gallon (imperial) of cold Water, the solutions mixed and boiled 15 minutes, then the precipitate is washed with boiling distilled Water, as above directed, and dried at a temperature not exceeding 212° F. (100° C.).

Milk of Magnesia.—By omitting to dry the precipitate as above prepared, and suspending it instead in as little water as will answer the purpose, Milk of Magnesia is produced. A proprietary article by this name has had a popular sale.

Uses.—Carbonate of Magnesium is extensively used in pharmacy for various purposes, and in medicine is employed as an antacid and laxative, in doses of 20 to 60 grains or more. It is a familiar household remedy for "heart-burn," and is considerably used as a toilet powder, and in tooth powders, etc.

2071. *Magnesii Citras Granulatus.*

Granulated Citrate of Magnesium.

Carbonate of Magnesium, .	11 parts or 770 grains.
Citric Acid,	48 parts or 2880 grains.
Bicarbonate of Sodium, . .	37 parts or 2220 grains.
Sugar, in No. 60 powder, .	8 parts or 480 grains.
Alcohol,	} each a sufficient quantity.
Distilled Water,	

Mix the Carbonate of Magnesium intimately with 33 parts or 1980 grains of Citric Acid and enough distilled Water to make a thick paste, dry this at a temperature not exceeding

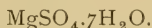
30° C. (86° F.), and reduce it to a fine powder. Then mix it intimately with the Sugar, the Bicarbonate of Potassium, and the remainder of the Citric Acid, previously reduced to a very fine powder. Dampen the mass with a sufficient quantity of Alcohol and rub it through a No. 20 tinned-iron sieve to form a coarse granular powder. Lastly, dry it in a moderately warm place and put up in well-closed bottles.

Uses.— This is given as an agreeable laxative, in doses of 1 to 3 teaspoonfuls, dissolved in cold water.

A great number of effervescing salts may be made in the same general manner.

2072. **Magnesii Sulphas.**

Sulphate of Magnesium — Epsom Salt.



This is prepared commercially by treating the earthy silicious Magnesium Hydrate with Sulphuric Acid. The mass is then dried and calcined at a red heat, to convert Ferrous Sulphate into Red Oxide of Iron. It is then dissolved in Water and Sulphide of Calcium added to separate any portion of Iron remaining, and at last dissolved again and crystallized to make the Epsom Salt of commerce. For laboratory experiments Carbonate of Magnesium may be dissolved to saturation in Sulphuric Acid, the solution concentrated by evaporation and crystallized.

Uses.— Sulphate of Magnesium is the commercial basis of most of the Magnesium Salts. It is extensively used as a medicine, being familiarly known as “Salts.” It acts as a cathartic in doses of 1 ounce, and is used in smaller doses as a laxative and refrigerant.

2073. **Magnesii Sulphis.**

Sulphite of Magnesium.



This Salt is now official in the U. S. P., and is readily made by passing a current of purified Sulphurous Acid Gas into a

rather thick milk of Magnesia, until the Acid is in slight excess.

Uses.—This salt is employed for the same purposes as Sulphite of Sodium and Sulphate of Potassium, but is less soluble and therefore less disagreeable to the taste. The dose is 15 to 30 grains.

Other Magnesium Salts.

The foregoing Official Salts of Magnesium are all that are much used in pharmacy or medicine, but as it combines with most of the Acids and the non-metals, a great number of other preparations are known. The following are the more important unofficial Salts :

2074. Acetate of Magnesium.— $\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2$.—Made by adding Carbonate of Magnesium to saturation to Acetic Acid, filtering the solution, concentrating and crystallizing.

2075. Bromide of Magnesium.—This is most conveniently made by adding Carbonate of Magnesium in excess to a solution of Bromide of Iron, then filtering, concentrating and crystallizing.

2076. Chloride of Magnesium.— MgCl .—This is a very deliquescent Salt, made by neutralizing Hydrochloric Acid with Magnesia, evaporating to dryness, adding an equal weight of Chloride of Calcium, heating in a red-hot platinum crucible, and fusing.

2077. Citrate of Magnesium.— $\text{Mg}_3(\text{C}_6\text{H}_5\text{O}_7)_2$.—This Salt is but little used, the effervescing Citrate being generally employed. It may be made by dissolving Citric Acid 3 parts in Water, $\frac{1}{2}$ part by the aid of heat, and adding to the solution 1 part of Magnesia and stirring them together until a dry mass results.

2078. Iodide of Magnesium.— MgI_2 .—This Salt may be made by dissolving Magnesia to saturation in Hydriodic Acid, concentrating and crystallizing.

2079. Lactate of Magnesium.— $\text{Mg}_2\text{C}_3\text{H}_5\text{O}_3 \cdot 3\text{H}_2\text{O}$.—This may be made by dissolving separately, in hot water, 6 parts of Lactate of Calcium and 5 parts Sulphate of Magnesium, mixing the solutions, filtering, evaporating the filtrate, and crystallizing.

2080. Phosphate of Magnesium.— $\text{MgHPO}_4 \cdot 6\text{H}_2\text{O}$.—This Salt may be made by mixing concentrated solutions of Sulphate of Magnesium and Phos-

phate of Sodium, allowing to stand some time, and collecting the crystals which form.

2081. Sulphate of Magnesium, Dried. — MgSO_4 — This is prepared by heating Sulphate of Magnesium until it has lost one-third of its weight, then sifting it.

2082. Tartrate of Magnesium. — This may be prepared by saturating a solution of Tartaric Acid with Carbonate of Magnesium, and evaporating by gentle heat to dryness.

2083. Magnesium Aperient or Seltzer Aperient. — Several Magnesian or Seltzer Aperients have had a large sale as proprietary medicines. The following formulæ make preparations similar to those most popular:

Sulphate of Magnesium 1 pound av., dry it by gradually increasing heat until it has lost one third of its weight; then add Tartaric Acid, dried and powdered, 10 ounces av., Magnesia (calcined) 8 ounces av., White Sugar, 24 ounces av., Bicarbonate of Sodium, dried and powdered, 8 ounces av., and mix them all well together and pass through a sieve.

Carbonate of Magnesium 1 pound, Bicarbonate of Sodium 1 pound, Rochelle Salts 2 pounds, Tartaric Acid 2 pounds. Mix them intimately.

MALTUM — MALT.

Grain, such as barley, oats, rye, maize, etc., in which a portion of the starch has become converted into sugar by *malting* is called *malt*. Barley and rye are the cereals usually employed for making malt, but other grains are sometimes used. The process of malting in brief consists in macerating the grain with just sufficient water to cover it, for 24 to 48 hours, during which time the water is mostly absorbed. The superfluous water is then drained off and the grain is deposited in heaps on the floor, where it is allowed to stand for 24 to 26 hours, during which time partial germination takes place, with a rise of temperature of about 10° F. It is then spread thickly on the floor and repeatedly turned with wooden shovels for some time. When the grain has germinated sufficiently (which it requires experience to determine) it is thrown into a kiln and kiln-dried until the water has evaporated and it is gradually heated to about 150° F. As thus prepared it constitutes the Malt used by brewers. The changes that occur in barley are

shown by the following table. They are similar in other grains :

	Composition of Barley.	Composition of Malt.
Hordeine,	55	12
Starch,	32	56
Sugar,	5	15
Gluten,	3	1
Gum,	4	15
Resin,	1	1
	100	100

The chief changes that occur, therefore, are the transformation of the hordeine (a form of starch peculiar to barley) into starch, sugar, and gum.

2084. Extract of Malt.

The process of making Extract of Malt has previously been referred to (1038), the changes consisting in the conversion of starch, by the action of diastase, aided by heat, first into dextrin and then into grape sugar. It is a thick syrup similar to glucose.

The value of Extract of Malt, aside from its nutritive value as food, depends upon the quantity of *Diastase* which it contains, and which acts in the same manner as the *Ptyalin* of saliva to digest starch, one part being sufficient to dissolve 2,000 parts of starch. This Diastase is a ferment peculiar to the germination of grains and seeds, and is developed in the process of malting, its action of converting starch into sugar being cut short by the drying of the germinating grain.

In making Extract of Malt great care must be exercised to preserve the excess of Diastase for the reasons above stated. The coarsely-ground Malt is first dampened with water heated to about 150° F., then firmly packed in the water-bath percolator, which is surrounded with water at about the same temperature. It is then covered with water heated to about 150° F. and allowed to stand for two hours, the heat being maintained at the same temperature. The percolation is then begun and water, heated to the specified temperature, added to the Malt until the percolate has no longer a perceptibly

sweet taste. As the percolate is received it must be at once placed in the evaporating apparatus, which should be a water-bath, by which the heat may be maintained at about 150° F., and the evaporation is to be conducted at that temperature until the product is concentrated to a thick syrup of 36° *Baumé*, or of which a pint will weigh 1½ pound av. As thus prepared Extract of Malt contains all its valuable properties unimpaired, and may be used as the basis for any of the various combinations which are called for.

Uses.—Extract of Malt is a valuable aid to digestion of amylaceous food, and is in itself a nutritive and tonic. It is given in doses of a tablespoonful or more.

Maltine.—Maltine is a proprietary Malt Extract, made by the Maltine Manufacturing Co., Yonkers, on the Hudson. It is claimed to be made of malted barley, wheat, and oats, equal parts, in the same general manner as has been described for making Extract of Malt. It is used for the same purposes and in the same manner as the foregoing. The formulas which are given for Malt Extract combinations apply to Maltine as well.

2085. Liquid Malt Extract.

The thick Extracts of Malt which have previously been described are inconvenient for some forms of medication, a more limpid extract being much more desirable. In the thick Malt Extracts, also, a great portion of the Diastase has been required to convert the starchy matters into sugar, the excess, which was not required for that purpose, only being available. In the Liquid Malt Extracts it is aimed to retain the diastase and valuable extractive matter of the Malt without the conversion of its starch into sugar (as that only serves as a food which may be more cheaply supplied from other sources), and a consequent saving of Diastase. The following formula is designed to secure this result:

Barley Malt, coarsely ground, . . .	2 pounds av.
Hops (new crop), coarsely ground, . . .	2 ounces av.
Alcohol,	2 pints.
Water, a sufficient quantity.	

Mix the Alcohol with 4 pints of Water, and, having mixed the Malt and the Hops together, moisten them with the liquid and pack firm in the water-bath percolator, and pour upon them the remainder of the liquid. Allow to stand 24 hours, then heat moderately, and, after one hour, begin to percolate and continue until the percolate will no longer drop, then add Water to the drugs in the percolator and continue the percolation until 4 pints have been obtained, which reserve; continue the percolation with Water until the drugs are exhausted, evaporate the last portion of the percolate by open evaporation to 4 fl.ounces. Distil the Alcohol from the reserved portion by the heat of a water-bath not exceeding 150° F., and when 2 pints have been recovered continue the evaporation on a water-bath, at the specified heat, until the liquid is reduced to 24 fl.ounces. To this add the reserved portion and 8 fl.ounces of Alcohol and filter clear.

This makes a Fluid Extract of Malt in which all the valuable properties of Malt are retained. It is much stronger than most of the preparations put up as Liquid Malt Extract, and may be reduced for general sale by adding to it 3 or 4 parts of Water, with just sufficient Alcohol to insure its keeping.

Uses.—It is used for the same purposes as other Malt Extracts and given in doses of a dessertspoonful or more. The diluted liquid may be given in doses of a wineglassful. Liquid Malt Extract may be used in any of the combinations for which formulæ are given instead of Malt Extract, if desired.

2086.

Malt Extract with Hops.

Malt Extract,	1 pint.
Fluid Extract of Hops,	½ fl.ounce.

Rub the fluid Extract in a mortar first with a small portion of the Malt Extract and then with the remainder.

It may also be made by steeping 1 part of hops in the percolate from 32 parts of malt during the process of condensation.

This is called by some manufacturers Extract of Malt (plain). It is more desirable for dispensing and taking than simple Extract of Malt on account of the hop bitter, but it should not be used in combinations unless so directed. The dose is a dessertspoonful to a tablespoonful.

2087. Malt Extract with Alternatives.

Bromide of Calcium,	160 grains.
Iodide of Potassium,	160 grains.
Bromide of Sodium,	96 grains.
Water, hot,	1 fl.ounces.
Malt Extract,	15 fl.ounces.

Dissolve the Salts in the hot water and mix thoroughly with the Malt Extract. The dose is a tablespoonful containing 13 grains of the Alternative Salts.

2088. Malt Extract with Beef and Iron.

Liebig's Extract of Meat,	½ ounce av.
Water,	1 fl.ounce.
Malt Extract,	15 fl.ounces.

Rub the Extract of Meat with the water and mix thoroughly with the Malt Extract. Dose, a tablespoonful to a wineglassful.

2089. Malt Extract with Cod Liver Oil Combinations.

The formula for Cod Liver Oil with Extract of Malt is given (878), and consists simply in rubbing 8 fl.ounces of Cod Liver Oil with 8 fl.ounces of Malt Extract, and adding 20 minims Oil of Wintergreen, and 5 minims Oil of Bitter Almonds for flavoring. A great variety of medicines may be combined with this base, the following being the principal combinations known in the market.

2090. Malt Extract with Cod Liver Oil and Dialysed Iron. — Add 320 minims of Dialysed Iron to a pint of Malt Extract with Cod Liver Oil. The dose is a tablespoonful containing 10 minims Dialysed Iron.

2091. Malt Extract with Cod Liver Oil and Iodide of Iron. — Dissolve 32 grains Tasteless Iodide of Iron (Creuse's), in ½ ounce hot Water and mix thoroughly with a pint of Malt Extract with Cod Liver Oil. The dose is a tablespoonful containing 1 grain Tasteless Iodide of Iron.

2092. Malt Extract with Cod Liver Oil and Pepsin. — Saccharated Pepsin, 128 grains, rubbed to a fine powder in a mortar, then with a portion of the Cod Liver Oil and Malt, and then with the remainder. Dose, a tablespoonful containing 4 grains of Pepsin.

2093. Malt Extract with Cod Liver Oil and Pancreatin. — Saccharated Pancreatin, 128 grains, rubbed to a fine powder in a mortar, then with a portion of the Cod Liver Oil and Malt, and then with the remainder. Dose, a tablespoonful containing 4 grains Pancreatin.

2094. Malt Extract with Cod Liver Oil, Pepsin and Pancreatin.—Saccharated Pepsin, 128 grains, Saccharated Pancreatin, 128 grains, mixed with a pint of Cod Liver Oil and Malt, the same as the preceding. The dose is a tablespoonful containing 1 grain each Pepsin and Pancreatin.

2095. Malt Extract with Cod Liver Oil and Hypophosphites.—Hypophosphite of Calcium, 64 grains, Hypophosphite of Sodium, 48 grains, Hypophosphite of Potassium, 32 grains, Glycerin, 1 fl.ounce, hot Water, 1 fl.ounce, Malt with Cod Liver Oil, 14 fl.ounces. Rub the Hypophosphites to a fine powder and dissolve as nearly as possible in the hot Water and Glycerin, then rub thoroughly with the Malt and Cod Liver Oil. Dose, a tablespoonful containing about $4\frac{1}{2}$ grains of the Hypophosphites.

2096. Malt Extract with Cod Liver Oil and Phosphorus.—Thompson's Solution of Phosphorus, 1 fl.ounce, mixed thoroughly by rubbing first with a small portion of Malt Extract with Cod Liver Oil sufficient to make a pint. Dose, a tablespoonful, containing about $1\frac{1}{2}$ grain of Phosphorus.

2097. Malt Extract with Cod Liver Oil, Phosphorus, Iron and Nux Vomica.—Add to the above preparation 1 drachm Tincture of Nux Vomica, and 1 drachm Solution of Phosphate or Iron.

2098. Malt Extract with Cod Liver Oil and Phosphates.—Concentrated Solution of Phosphates Compound (1938), $\frac{1}{2}$ fl.ounce, Cod Liver Oil and Malt, 1 pint. Mix them thoroughly by rubbing together in a mortar.

2099. Extract of Malt with Iron.—Extract of Malt may be combined with most any of the strong Solutions or Soluble Salts of Iron.

2100. Extract of Malt with Citrate of Iron.—Dissolve 64 grains of Citrate of Iron and Ammonium in half an ounce of Hot Water and mix with a pint of Extract of Malt. Dose, a tablespoonful, containing 2 grains of the Iron Salt.

2101. Extract of Malt with Dialysed Iron.—Mix 320 minims Solution Dialysed Iron with a pint of Malt Extract. Dose, a tablespoonful, containing 10 minims Dialysed Iron.

2102. Extract of Malt with Iodide of Iron.—Dissolve 64 grains Tasteless Iodide of Iron (Creuse's) in half fl.ounce Warm Water and mix with a pint of Extract of Malt. Dose, a tablespoonful, containing 2 grains of the Iron Salt.

2103. Extract of Malt with Phosphate of Iron.—Dissolve 64 grains Phosphate of Iron in scales (1880) in half an ounce of Hot Water and mix with a pint of Malt Extract. The dose, a tablespoonful, contains 2 grains of the Iron Salt.

2104. Extract of Malt with Tincture of Iron.—Tasteless Tincture of Iron (1923) half fl.ounce Extract of Malt a pint; mix them well together. Combinations may also be made by mixing equal measures of *Malt Extract* and *Elixir Gentian with Tincture Chloride of Iron*.

2105. Extract of Malt with Phosphate of Iron and Quinine.—Malt Extract, 8 fl.ounces, Elixir Iron and Quinine, 8 fl.ounces; mix them well together. *Citrate of Iron and Quinine with Malt Extract* may be made by adding 2 fl.ounces of Solution Citrate of Iron and Quinine to 14 fl.ounces of Extract of Malt.

2106. Extract of Malt with Phosphate of Iron, Quinine and Strychnine.—Malt Extract, 8 fl.ounces, Elixir Iron, Quinine and Strychnine, 8 fl.ounces. Mix them well together.

Citrate of Iron, Quinine and Strychnine with Malt Extract, may be made by adding 2 fl.ounces Solution Citrate of Iron and Quinine and 1 fl.drachm of Solution of Strychnine to 14 fl.ounces of Malt Extract.

2107. Extract of Malt with Hypophosphites.

Hypophosphite of Calcium,	64 grains.
Hypophosphite of Sodium,	48 grains.
Hypophosphite of Potassium,	32 grains.
Glycerin,	1 fl.ounce.
Hot Water,	1 fl.ounce.
Extract of Malt,	14 fl.ounces.

Rub the Hypophosphites to a very fine powder in a mortar, dissolve them as nearly as possible in the Hot Water and Glycerin, and mix them with the Malt Extract. The dose is a tablespoonful, containing $4\frac{1}{2}$ grains of the mixed Hypophosphites.

2108. Extract of Malt with Lactopeptine.

Lactopeptine,	128 grains.
Hydrochloric Acid, diluted,	1 fl.drachm.
Glycerin,	1 fl.ounce.
Water,	1 fl.ounce.
Malt Extract,	14 fl.ounces.

Rub the Lactopeptine with the Glycerin and Water, add the Acid, and macerate in a warm place for 12 hours, then mix with the Malt Extract. The combinations of Lactopeptine with Malt Extract may be made in the same manner as those of Pepsin.

2109. Extract of Malt with Lactophosphates.

Solution Lactophosphate of Calcium,	$\frac{1}{2}$ fl.ounce.
Solution Lactophosphate of Iron,	$\frac{1}{4}$ fl.ounce.
Malt Extract,	1 pint.

Mix them thoroughly. A tablespoonful contains 3 grains of the Lactophosphates. A variety of combinations of Extract of Malt and Lactophos-

phates, and Calisaya, Gentian, etc., may be made by mixing equal parts of Malt Extract with Lactophosphates, and Elixirs of Calisaya, Gentian, etc., as desired.

2110. Extract of Malt with Pepsin.

Saccharated Pepsin,	128 grains.
Hydrochloric Acid, diluted,	1 fl.drachm.
Glycerin,	1 fl.ounce.
Water,	1 fl.ounce.
Malt Extract,	14 fl.ounces.

Rub the Pepsin with the Glycerin and Water, add the Acid and macerate in a warm place for 12 hours, then mix with the Malt Extract. A tablespoonful contains 4 grains Pepsin.

2111. Extract of Malt with Pepsin and Bismuth.—Solution of Bismuth (1873) $\frac{1}{2}$ fl.ounce, Extract of Malt with Pepsin 1 pint. Rub the Solution first with a small portion of the Extract of Malt and Pepsin, and then with the remainder. A dessertspoonful, the usual dose, contains 2 grains each Pepsin and Bismuth.

2112. Extract of Malt with Pepsin, Bismuth, and Strychnine.—Solution of Bismuth (1873) $\frac{1}{2}$ fl.ounce, Solution of Strychnine (1942) 1 fl.drachm, Extract of Malt with Pepsin 1 pint. Rub the Solutions first with a small portion of the Extract of Malt and Pepsin, and then with the remainder. A dessertspoonful, the usual dose, contains 2 grains each Pepsin and Bismuth and $\frac{1}{10}$ grain Strychnine.

2113. Extract of Malt with Pepsin and Iron.—Solution of Citrate or Phosphate of Iron $\frac{1}{2}$ fl.ounce, Extract of Malt with Pepsin 1 pint. Mix the Solution with the Extract. Other solutions or salts of Iron may be combined, as desired, with Extract of Malt with Pepsin. The usual dose is a tablespoonful, containing 4 grains of the Iron salt and 4 grains of Pepsin.

2114. Extract of Malt with Pepsin and Pancreatin.—Saccharated Pepsin 128 grains, Saccharated Pancreatin 128 grains, Extract of Malt 1 pint. Rub the powders first with a small portion of the Extract, and then with the remainder. A dessertspoonful, the usual dose, contains 2 grains each Pepsin and Pancreatin.

2115. Malt Extract with Peptones.—This is made by digesting finely chopped beef 2 ounces av., at about 100° F., in a solution made of Scale Pepsin 30 grains, Hydrochloric Acid, diluted, 2 fl.drachms, Water 1 fl.ounce, Glycerin 1 fl.ounce, until the beef is reduced to a semi-fluid state, requiring about 6 or 7 hours. This is then mixed with sufficient Malt Extract to make a pint.

2116. Malt Extract with Phosphates.

Concentrated Solution of Phosphates, 1 fl.ounce.

Malt Extract, 15 fl.ounces.

Mix them thoroughly. Dose, a dessertspoonful to a tablespoonful.

A variety of combinations of this preparation with Calisaya, Gentian, etc., may be made if desired.

2117. Malt Extract with Cascara Sagrada.—This may be made by mixing 1 fl.ounce of Fluid Extract Cascara Sagrada with 15 fl.ounces of Malt Extract. It is best combined with Liquid Malt Extract. It is a valuable laxative, in doses of a tablespoonful or more.

2118. Malt Extract with Viburnum.—Mix 1 fl.ounce Fluid Extract of Black Haw with 15 fl.ounces Liquid Extract of Malt. Dose, a tablespoonful as a tonic for female difficulties, etc.

2119. Malt Extract with Wafer Ash.—Mix 1 fl.ounce Fluid Extract Ptelea or Wafer Ash Bark with 15 fl.ounces Malt Extract. Used for a tonic, dyspepsia, etc. Dose, a dessertspoonful or more. Many other combinations of Malt Extract or Liquid Malt Extract with fluid extracts of tonics, laxatives, etc., may be used to advantage.

2120. Malt Extract with Yerba Santa.—Mix 1 fl.ounce Fluid Extract Yerba Santa with 15 fl.ounces of Malt Extract. As a carrier for Quinine and other bitter medicines this preparation cannot be excelled.

The following combinations of Malt Extract have a popular sale as proprietary medicines, and may be readily and profitably put up by druggists:

2121. Malt Bitters.

Bitter Orange Peel,	4	ounces av.
Wahoo Bark,	2	ounces av.
Cardamom Seeds,	1	ounce.
Cinnamon Bark,	1	ounce.
Good Whisky,	3	pints.
Water,	2½	pints.
Liquid Malt Extract,	3	pints.

Grind the drugs to a coarse powder and percolate in the water-bath percolator with the mixed Whisky and Water, then add the Liquid Malt Extract to the percolate, and filter or strain. The dose is a tablespoonful to a wine-glassful.

2122. Malt and Tar Cough Syrup.

Oil of Tar,	½ fl.ounce.
Oil of Wintergreen,	15 minims.
Oil of Peppermint,	10 minims.
Oil of Sassafras,	10 minims.
Oil of Anise,	15 minims.
Tincture of Tolu,	2 fl.ounces.
Carbonate of Magnesium,	2 ounces av.
Water,	3½ pints.
Alcohol,	½ pint.
Fluid Extract Lobelia,	1 fl.ounce.
Fluid Extract Bloodroot,	½ fl.ounce.
Tincture of Opium,	6 fl.ounces.
Chloroform,	2 fl.drachms.
Chloride of Ammonium,	2 ounces av.
Tartar Emetic,	30 grains.
Malt Extract,	4 pints.

Mix the Oils with the Tincture of Tolu, and rub together with the Carbonate of Magnesium in a mortar. Mix the Alcohol with the Water, and triturate with the mixture in the mortar; then set aside for a few hours and filter. Dissolve the Tartar Emetic and Chloride of Ammonium in the filtrate. Mix the fluid extracts Tincture of Opium and Chloroform with the Malt Extract by agitation; then add the filtrate in which the salts have been dissolved and shake them well together.

This is a very efficient cough remedy. Other ingredients may be added if desired. The dose is from a teaspoonful to a dessertspoonful.

2123. Malt Tonic.

Sulphate of Quinine,	60 grains.
Sulphate of Cinchonidine,	120 grains.
Compound Tincture of Cardamom,	4 fl.ounces.
Good Whisky,	4 pints.
Water,	2 pints.
Liquid Malt Extract,	3 pints.

Mix the Whisky, Water, and Compound Tincture of Cardamom and dissolve the Alkaloidal salts in the mixture. After standing a few hours add the Malt Extract and strain or filter.

Many other ingredients may be added to this preparation if desired, as Tincture or Fluid Extract of Hops, say 2 ounces, for *Malt-Hop Tonic*, etc.

The dose is a dessertspoonful to a tablespoonful.

2124. Malt Cordial, or Malt-Wine Cordial.

This may be made the same as the foregoing, only using Wine in place of the Whisky, or as follows :

Sulphate of Quinine,	40	grains.
Sulphate of Cinchonidine,	80	grains.
Soluble Elixir Flavoring,	4	fl.ounces.
Sherry or other Wine,	3	pints.
Water,	1 ½	pint.
Alcohol,	½	pint.
Malt Extract,	3	pints.

Mix the Wine, Water, and Alcohol and dissolve the Alkaloidal salts in the mixture, add the Elixir flavoring, let stand a few hours, then add the Malt Extract and strain or filter.

This is also known as *Malt Wine*, and many combinations with it may be made.

MANGANESE.

Symbol, Mn ; Atomic Weight, 54 ; Sp. gr., 7.13.

Manganese is a very hard, brittle metal, found quite abundant in the form of black oxide. It is classed chemically with iron and chromium, its salts very much resembling those of iron. Metallic Manganese is seldom seen except in the chemist's laboratory ; its affinity for oxygen is so great that when powdered it decomposes water without the aid of heat, and must be preserved in naphtha.

It forms compounds with the non-metallic elements, and unites with hydrogen and oxygen, forming Manganic Acid (H_2MnO_4), which is only known in its combinations with bases called *Manganates*. With Oxygen it forms definitely five compounds, and two more are supposed to exist. The Binoxide of Manganese is much employed as a source of Oxygen for manufacturing purposes, as in the production of chlorine for bleaching purposes, the melting of glass with the oxyhydrogen jet, etc. In pharmacy it is employed for the production of chlorine, permanganate of potassium, and peroxide of hydrogen. A

few of the Manganese salts are employed in medicine as alteratives and tonics.

The following are the official salts of Manganese :

2125. **Mangani Oxidum Nigrum.**

Black Oxide of Manganese—Dioxide of Manganese.



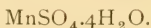
This is described in the U. S. P. as native crude Binoxide of Manganese, containing at least 66 per cent. of the pure Oxide.

The Br. P. gives it the name *Manganesii Oxidum Nigrum*.

Uses.—It is the commercial basis of the Manganese salts, and is extensively used for obtaining oxygen for chemical and industrial purposes. As found in the market it varies considerably as regards its purity, and those who use it largely for industrial purposes buy it only upon assay.

2126. **Mangani Sulphas.**

Sulphate of Manganese.



This may be prepared by the process suggested by Pro. Diehle, which consists in heating together to redness in a crucible Manganese dioxide and charcoal, treating the residue with Sulphuric Acid and again heating to redness, then dissolving the residue in water, filtering the solution and crystallizing.

Uses.—This salt is used in making some other preparations of Manganese, and is sometimes given in doses of 5 to 15 grains as a tonic.

Other Salts of Manganese.

The two foregoing are all the salts of Manganese official in the U. S. P. The Permanganate of Potassium is the most

important Manganese compound medicinally, but that is included in the Potassium salts. Quite a number of the other Manganese salts have their uses in pharmacy and medicine, the most important ones being noted below :

2127. Acetate of Manganese— $\text{Mn}(\text{C}_2\text{H}_3\text{O}_2)_2$.—This salt may be most conveniently made by neutralizing Acetic Acid with Carbonate of Manganese, concentrating the solution by evaporation and crystallizing.

2128. Arseniate of Manganese— MnHAsO_4 .—By neutralizing a Solution of Arsenic Acid with freshly precipitated Carbonate of Manganese, concentrating and crystallizing.

2129. Benzoate of Manganese.—By adding to a Solution of Benzoic Acid Carbonate of Manganese until no more will be combined.

2130. Carbonate of Manganese— MnCO_3 .—This is most conveniently made by adding a Solution of Sulphate of Manganese to a Solution of Carbonate of Potassium or Sodium, washing the precipitate and drying.

2131. Chloride of Manganese— MnCl_2 .—By dissolving Dioxide of Manganese in Hydrochloric Acid, purifying from Iron salts, etc., evaporating and crystallizing.

2132. Citrate of Manganese.—By dissolving Carbonate of Manganese in a strong Solution of Citric Acid, concentrating and crystallizing.

2133. Hypophosphite of Manganese.—By dissolving Carbonate of Manganese in Hypophosphorous Acid, and crystallizing, or by decomposing a Solution of Sulphate of Manganese with a strong Solution of Hypophosphite of Calcium, filtering, and concentrating the solution.

2134. Iodide of Manganese.—By dissolving Carbonate of Manganese in Hydriodic Acid, concentrating and crystallizing in vacuo.

2135. Oxides of Manganese.—Besides the official *Dioxide* of Manganese, MnO_2 , which is black, there exists the *Monoxide*, MnO , light green, the *Sesquioxide*, Mn_2O_3 , dark brown, the *Magnetic Oxide*, Mn_3O_4 , red, and *Permanganic Oxide*, Mn_2O_7 , a dark brown liquid.

2136. Phosphate of Manganese— $\text{MnHPO}_4 \cdot 6\text{H}_2\text{O}$.—This is most conveniently made by precipitating a Solution of Sulphate of Manganese by adding it to a Solution of Phosphate of Sodium, washing the precipitate and drying.

2137. Tartrate of Manganese— $\text{MnC}_4\text{H}_4\text{O}_6$.—By adding freshly precipitated Carbonate of Manganese to a Solution of Tartaric Acid, concentrating and crystallizing.

Manganic Acid, H_2MnO_4 , is only known by its salts, which are called *Manganates*. *Permanganic Acid*, HMnO_4 , is obtained by cautiously distilling Permanganate of Potassium and Sulphuric Acid. It is the acid base of the *Permanganate* salts.

MASSÆ — MASSES.

Under this title the U. S. P. gives the formulæ for three preparations, which are made and kept in the form of a pilular mass, and are frequently sold or dispensed in this form, but are also designed to be made up into pills, or to be mixed with other substances for making pills. Under the title *Pilulæ* in the Br. P. quite a number of masses are included, see *PILULÆ*. The U. S. official formulæ are as follows :

2138. *Massa Copaibæ.*

Mass of Copaibæ — Pilulæ Copaibæ.

Copaiba 94 parts or 1 ounce av., Magnesia (recently prepared) 6 parts or 28 grains. Mix them intimately and set aside until it concretes into a pilular mass.

2139. *Massa Ferri Carbonatis.*

Mass of Carbonate of Iron — Vallet's Mass — Pilulæ Ferri Carbonatis.

Sulphate of Iron, . . .	100 parts or	2 ounces av.
Carbonate of Sodium, .	110 parts or	2 $\frac{1}{8}$ ounces av.
Clarified Honey, . . .	38 parts or	$\frac{3}{4}$ ounce av.
Sugar, in coarse powder,	25 parts or	$\frac{1}{2}$ ounce av.
Distilled Water, }	each a sufficient quantity.	
Syrup, }		

Dissolve the Iron Salt and Sodium Salt separately, each in 200 parts or a pint of boiling Distilled Water, and, having added 25 parts or 3 fl.drachms of Syrup to the solution of Iron Salt, filter both solutions. Mix them when cold in a bottle just large enough to hold both solutions, and stop the bottle tightly and set aside so that the Carbonate of Iron may subside. Pour off the supernatant liquid, and having mixed Syrup and Distilled Water in the proportion of one part or

1½ fl.drachm of Syrup to 16 parts or 4 fl.ounces of water. Wash the precipitate until the washings no longer have a saline taste. Drain the precipitate on a flannel cloth and express as much of the water as possible. Lastly, mix the precipitate immediately with the Honey and Sugar, and by means of a water-bath evaporate the mixture, stirring constantly until it is reduced to 100 parts or two ounces av.

The Br. *Pilula Ferri Carbonatis* is made with Saccharated Carbonate of Iron, Br., 1 ounce, Confection of Rose ¼ ounce.

The German *Pilulæ Ferri Carbonici* is made with Sulphate of Iron 50 parts, Bicarbonate of Sodium 35 parts, Powdered Sugar 8 parts, Clarified Honey 26 parts, Water, etc., in the same manner as by the U. S. formula, to make 40 parts.

2140. **Massa Hydrargyri.**

Mass of Mercury—Blue Mass—Blue Pill.

Mercury,	33 parts or	578 grains.
Glycyrrhiza, in No. 60 Powder, 5 parts or	58	grains.
Althæa, in No. 60 Powder, 25 parts or	1	ounce av.
Glycerin,	3 parts or	45 minims.
Honey of Rose,	34 parts or	1½ fl.ounce.

Triturate the Mercury with the Honey of Rose and Glycerin until it is extinguished. Then gradually add the Glycyrrhiza and Althæa, and continue the trituration until globules of Mercury cease to be visible under a lens magnifying 10 diameters. The extinguishment of the Mercury may be hastened by adding to the Honey of Rose a few drops of Tincture of Tolu or Benzoin occasionally.

The Br. formula under the title *Pilula Hydrargyri* or Mercurial Pill is Mercury 2 ounces av., Confection of Rose 3 ounces av., Liquorice Root in fine power 1 ounce av. The Mercury is first rubbed with the Confection, then with the Liquorice.

Blue Mass is one of the articles most frequently called for, but it is seldom made by druggists, being supplied by manufacturing pharmacists, who have better facilities for preparing it.

MELITA — HONEYS.

Honey is a saccharine secretion deposited by the Honey Bee, *Apis Mellifica*, in honey comb. In pharmacy strained or drawn Honey only is employed as a basis of Honey preparations and sold or dispensed in medicine. The following preparations of Honey are official. They are thick, syrupy preparations, used chiefly for their local effect or as carriers for medicinal substances.

2141. Mel Despumatum. U. S.

Clarified Honey.

Honey, a convenient quantity. Heat by means of a water-bath, remove the scum, and strain.

The Br. and German Pharmacopœias, under the title of *Mel Depuratum*, direct similar methods of preparing it.

This is used for making confections, oxymel, etc.

2142. Mel Boracis. Br.

Borax Honey.

Borax, in fine powder, . . . 60 grains or 2 parts.

Glycerin, 30 grains or 1 part.

Clarified Honey, 480 grains or 16 parts.

Mix them. This is used for cankered mouth and throat.

2143. Mel Rosæ. U. S.

Honey of Rose.

Red Rose, in No. 40 powder, 8 parts or 2 ounces av.

Clarified Honey, 92 parts or 23 ounces av.

Diluted Alcohol, a sufficient quantity.

Moisten the powder with 2 parts or $\frac{1}{2}$ fl.ounce of diluted Alcohol, pack it firmly in a conical glass percolator and gradually pour diluted Alcohol upon it until 33 parts or 8 fl.ounces

of percolate are obtained. Reserve the first 3 parts or 6 fl.drachms of the percolate, evaporate the remainder by means of a water-bath to 5 parts or 10 fl.drachms, add the reserved portion, and mix the whole with the clarified Honey.

The German formula produces a similar preparation.

This is used in making several washes and confections.

The following Oxymels, official in the Br. P., may quite properly be included under this heading :

2144. Oxymel. Br.

Clarified Honey, 40 ounces or 8 parts.

Acetic Acid, 5 fl.ounces or 1 fl.part.

Distilled Water, 5 fl.ounces or 1 fl.part.

Liquefy the Honey by heat and mix with the Acetic Acid and Water.

The dose is 1 to 2 fl.drachms for coughs, etc.

2145. Oxymel Scillæ. Br.

Oxymel of Squill.

Vinegar of Squill, 1 pint or 5 fl.parts.

Clarified Honey, 2 pounds or 8 parts.

Mix and evaporate by a water-bath until the product, when cold, shall have a specific gravity of 1.32.

This is used for coughs, in doses of $\frac{1}{2}$ to a teaspoonful.

METHYL.

CH_3 .

Methyl is the radical of the Methyl series of compounds of which Methylic or Wood Alcohol is the hydrate. It forms, with other bodies, a large number of compounds highly important in chemistry and pharmacy, similar in characteristics to

the compounds of Amyl, Ethyl and other radicals of the Alcohol series, see page 85.

The most important combination of Methyl is its hydrate, Methylic or Wood Alcohol, which is obtained by distillation from carbonaceous substances and is hence called *Carbonol*. It is the commercial basis of the Methyl products, and has already been described, page 95. The other Methyl salts are but little used in pharmacy, the Acetate, Chloride and Iodide being the most important. Methyl salts form valuable combinations with Aniline, producing some of the most brilliant colors, and Oil of Wintergreen is chemically *Salicilate of Methyl*.

MISTURÆ — MIXTURES.

The term Mixture is applied in Pharmacy to aqueous liquid preparations which contain insoluble substances suspended or precipitated, and are intended for internal use or administration. In a popular sense the name Mixture is applied to a great variety of preparations, many of which are emulsions, solutions, syrups, tinctures, etc. Under this heading the Mixtures official in the U. S. and Br. Pharmacopœias will first be given and then the more important unofficial Mixtures which are not more naturally included under other headings. See, also, Proprietary Medicines, the Standard Remedies, etc.

2146. Mistura Ammoniaci.

Ammoniac Mixture. U. S.—Ammoniacum Mixture. Br.

Ammoniac, 4 parts or 18 grains.

Water, 100 parts or 1 fl.ounce.

Rub the Ammoniac with the Water gradually added until they are thoroughly mixed, and strain.

The Br. formula is about the same, being $\frac{1}{4}$ ounce av. to 8 fl.ounces of Water.

This is used for coughs, etc., in doses of $\frac{1}{2}$ to a fl.ounce.

2147. Mistura Amygdalæ.*Almond Mixture.*

The U. S. formula is:

Sweet Almonds,	6 parts or 240 grains.
Acacia, in fine powder, . . .	1 part or 40 grains.
Sugar,	3 parts or 120 grains.
Distilled Water,	100 parts or 9 fl.ounces.

Having blanched the Almonds, add the Acacia and Sugar and beat them in a mortar until thoroughly mixed; then rub the mixture with the distilled Water, gradually added, and strain.

The Br. formula is compound powder of Almonds 2 ounces, distilled Water 16 fl.ounces, rubbed together and strained.

This is a bland mixture, used for irritable stomach, coughs, etc. Dose 1 to 2 fl.ounces.

2148. Mistura Asafœtidæ. U. S.*Asafetida Mixture.*

Asafetida,	4 parts or 18 grains.
Water,	100 parts or 1 fl.ounce.

Rub the Asafetida with the Water, gradually added, until they are thoroughly mixed, and strain.

The dose is a dessertspoonful to a tablespoonful, as an antispasmodic, for worms, etc.

2149. Mistura Chloroformi. U. S.*Chloroform Mixture.*

Purified Chloroform,	8 parts or 4 fl. drachms.
Camphor,	2 parts or 96 grains.
Fresh Yolk of Egg,	10 parts or 1 fl.ounce.
Water,	80 parts or 8 fl.ounces.

Rub the Yolk of Egg in a mortar, first by itself, then with the Camphor, previously dissolved in the Chloroform, and,

lastly, with the Water, gradually added, so as to make a uniform mixture.

This is really an emulsion of *Chloroform and Camphor*, making a very convenient manner of exhibiting them.

The dose is a teaspoonful to a dessertspoonful.

2150. **Mistura Creasoti. Br.**

Creasote Mixture.

Creasote,	15 minims or	1 fl.part.
Glacial Acetic Acid,	15 minims or	1 fl.part.
Spirit of Juniper,	30 minims or	2 fl.parts.
Syrup,	1 fl.ounce or	32 fl.parts.
Distilled Water,	15 fl.ounces or	480 fl.parts.

Mix the Creasote with the Acetic Acid, gradually add the Water, and, lastly, the Syrup and Spirit.

Dose, 1 to 2 fl.ounces.

2151. **Mistura Cretæ.**

Chalk Mixture.

The U. S. formula directs :

Compound Chalk Powder,	20 parts or	240 grains.
Cinnamon Water,	40 parts or	1 fl.ounce.
Water,	40 parts or	1 fl.ounce.

Rub the Powder with the Cinnamon Water, and Water gradually added, until they are thoroughly mixed.

This preparation as thus prepared will not keep for any great length of time, and it is suggested to use, instead of 1 fl.ounce of Water, only $\frac{1}{2}$ ounce, and $\frac{1}{2}$ ounce Alcohol, making a permanent preparation.

The Br. formula is: Prepared Chalk $\frac{1}{4}$ ounce av., powdered Acacia $\frac{1}{4}$ ounce av., Syrup $\frac{1}{2}$ fl.ounce, Cinnamon Water $7\frac{1}{2}$ fl.ounces.

The dose of Chalk Mixture is 1 to 2 fl.ounces, as an antacid and for bowel complaints of children.

2152. Mistura Ferri Aromatica. Br.*Aromatic Mixture of Iron.*

Red Cinchona Bark, in powder, . . .	1	ounce av.
Columba Root, in coarse powder, . . .	$\frac{1}{2}$	ounce.
Cloves, bruised, in coarse powder, . . .	$\frac{1}{4}$	ounce.
Fine Iron Wire,	$\frac{1}{2}$	ounce.
Compound Tincture of Cardamom, . . .	3	fl.ounces.
Tincture of Orange Peel,	$\frac{1}{2}$	fl.ounce.
Peppermint Water, a sufficient quantity.		

Macerate the drugs and the Iron with 12 fl.ounces of Peppermint Water, in a closed vessel, for three days, agitating occasionally; then filter the liquid, adding as much Peppermint Water to the filtrate as will make the product measure $12\frac{1}{2}$ fl.ounces; to this add the tinctures, and preserve the mixture in a well-stopped bottle. Dose, 1 to 2 fl.ounces, as an iron tonic.

2153. Mistura Ferri Composita.*Compound Iron Mixture—Griffith's Mixture.*

The U. S. formula is:

Sulphate of Iron, in coarse powder,	6 parts or 24	grains.
Myrrh, in small pieces, . . .	18 parts or 72	grains.
Sugar,	18 parts or 72	grains.
Carbonate of Potassium, . . .	8 parts or 32	grains.
Spirit of Lavender,	50 parts or $\frac{1}{2}$	fl.ounce.
Rose Water,	900 parts or 8	fl.ounces.

Rub the Myrrh, Sugar and Carbonate of Potassium with the Rose Water, gradually added, then with the Lavender, and lastly with the Sulphate of Iron. Pour the mixture immediately into a bottle, which should be well stopped.

The Br. formula is Sulphate of Iron 25 grains, Myrrh, Sugar, each 60 grains, Carbonate of Potassium, 30 grains, Spirit of

Nutmeg, 4 fl.drachms, Rose Water, 9½ fl.ounces, made in a similar manner.

This is used as an iron tonic, especially for female complaints, amenorrhœa, etc. The dose is from 1 to 2 fl.ounces.

2154. *Mistura Ferri et Ammonii Acetatis. U.S.*

Mixture of Acetate of Iron and Ammonium — Basham's Mixture.

Tincture Chloride of Iron,	2 parts or 3	fl.drachms.
Diluted Acetic Acid,	3 parts or 4	fl.drachms.
Solution of Acetate of Ammonium,	20 parts or 3½	fl.ounces.
Elixir of Orange (Simple Elixir),	10 parts or 1½	fl.ounce.
Syrup,	15 parts or 2	fl.ounces.
Water,	50 parts or 8	fl.ounces.

To the Solution of Acetate of Ammonium, previously mixed with the Diluted Acetic Acid, add the Tincture of Chloride of Iron, and afterward the Elixir of Orange, Syrup and Water, and mix the whole thoroughly. The dose of this, as an aromatic iron tonic, is an ounce or more after meals.

2155. *Mistura Glycyrrhizæ Composita. U. S.*

Compound Mixture of Glycyrrhiza—Brown Mixture.

Pure Extract of Glycyrrhiza,	3 parts or ½	ounce av.
Sugar,	3 parts or ½	ounce av.
Acacia, in fine powder,	3 parts or ½	ounce av.
Camphorated Tincture of Opium,	12 parts or 2	fl.ounces.
Wine of Antimony,	6 parts or 1	fl.ounce.
Spirit of Nitrous Ether,	3 parts or ½	fl.ounce.
Water,	70 parts or 12	fl.ounces.

Rub the Extract of Liquorice, Sugar, and Acacia, with the Water gradually added; then add the other ingredients, and mix the whole thoroughly.

Brown Mixture Improved.—As made by the foregoing formula, this preparation always has quite a precipitate or sediment, and although this corresponds with the pharmaceutical idea of a mixture, it is quite undesirable for dispensing in this form. The following formula does away with this objection chiefly: Glycyrrhizin Ammoniated 160 grains, Acacia in fine powder $\frac{1}{2}$ ounce av., Tincture of Opium 160 minims, Wine of Antimony 1 fl.ounce, Spirit of Nitrous Ether $\frac{1}{2}$ fl.ounce, Alcohol 2 fl.ounces, Warm Water sufficient to make a pint. Mix and dissolve.

Uses.—Brown Mixture was formerly very much prescribed as a cough preparation, and is yet considerably used for that purpose, in doses of a teaspoonful or more.

2156. Mistura Guaiaci. Br.

Guaiacum Mixture.

Guaiacum Resin, . . .	$\frac{1}{2}$ ounce av. or 1 part.
Refined Sugar, . . .	$\frac{1}{2}$ ounce av. or 1 part.
Gum Arabic, powdered, .	$\frac{1}{4}$ ounce av. or $\frac{1}{2}$ part.
Cinnamon Water, . . .	20 fl.ounces or 40 fl.parts.

Triturate the Guaiacum with the Sugar and the Gum, adding gradually the Cinnamon Water.

Uses.—This is a favorite remedy for rheumatism, in doses of $\frac{1}{2}$ to 2 fl.ounces.

2157. Mistura Magnesii et Asafoetidæ. U. S.

Mixture of Magnesia and Asafoetida — Dewee's Carminative.

Carbonate of Magnesium,	5 parts or 260 grains.
Tincture of Asafoetida, . . .	7 parts or 10 fl.drachms.
Tincture of Opium, . . .	1 part or 75 minims.
Sugar,	10 parts or $1\frac{1}{2}$ ounce av.
Distilled Water, sufficient to	
make	100 parts or a pint.

Rub the Carbonate of Magnesium and Sugar in a mortar with the Tinctures, then add gradually enough distilled Water to make 100 parts or a pint.

This favorite remedy is much used for children, in doses of a teaspoonful to a tablespoonful.

2158. Mistura Potassii Citratis.

Mixture of Citrate of Potassium — Neutral Mixture.

Fresh Lemon Juice, strained, 100 parts or 4 fl.ounces.

Bicarbonate of Potassium,

about 10 parts or 170 grains.

Add the Bicarbonate of Potassium gradually to the Lemon Juice until it is neutralized. This should be freshly made when wanted for use. It is used chiefly as a refrigerant.

2159. Mistura Rhei et Sodæ. U. S.

Mixture of Rhubarb and Soda.

Bicarbonate of Sodium, . 30 parts or $\frac{1}{2}$ ounce av.

Fluid Extract of Rhubarb, 30 parts or 3 fl.drachms.

Spirit of Peppermint, . . 30 parts or 5 fl.drachms.

Water, sufficient to make 1000 parts or a pint.

Dissolve the Bicarbonate of Sodium in 500 parts or half a pint of Water, add the Fluid Extract and Spirit and then enough Water to make 1000 parts or a pint.

This is used as an antacid and laxative, in doses from $\frac{1}{2}$ to 2 fl.ounces.

2160. Mistura Scammonii. Br.

Scammony Mixture.

Scammony, in powder, . . . 6 grains or 1 part.

Milk, 2 fl.ounces or 146 parts.

Triturate the Scammony with the Milk until a uniform emulsion is obtained. This should be freshly made when wanted for use. The dose is from 1 to 3 fl.ounces, as a purgative.

2161. Mistura Sennæ Composita. Br.*Compound Mixture of Senna—Black Draught.*

Sulphate of Magnesium,	4	ounces av. or 4 parts.
Liquid Extract of Liquor-		
ice,	1	ounce av. or 1 fl.part.
Tincture of Senna, . .	2½	fl.ounces or 2½ fl.parts.
Compound Tincture of		
Cardamoms,	1½	fl.ounce or 1½ fl.part.
Infusion of Senna, . .	15	fl.ounces or 15 fl.parts.

Dissolve the Sulphate of Magnesium in the Infusion of Senna with the aid of a little heat, then add the Liquid Extract and the Tinctures.

This is the familiar *British Black Draught*, quite similar to the U. S. and German Infusion of Senna Compound, but stronger.

Uses.—This is used as a purgative, in doses of 1 to 1½ fl.ounces, and as a laxative in smaller doses.

2162. Mistura Spiritus Vini Gallici. Br.*Mixture of French Brandy.*

French Brandy,	4	fl.ounces.
Cinnamon Water,	4	fl.ounces.
The Yolks of two Eggs.		
Refined Sugar,	¼	ounce.

Rub the Yolks and the Sugar together, then add the Cinnamon Water and the Spirit.

Uses.—Although our British friends call this a pharmaceutical preparation, it is more familiarly known in this country as *Egg-Nogg*, but is somewhat improved by more Sugar.

Other Mixtures.

The foregoing official Mixtures are all that are recognized in the U. S. and Br. Pharmacopœias, but a great many others

have been introduced by popular physicians as their favorite mixtures, and their formulæ have been preserved, and are here repeated. Other formulas for Mixtures will be found under other headings:

2163. Brown-Séquard's Anti-Epileptic Mixture.—Bromide of Sodium 360 grains, Bromide of Potassium 360 grains, Bromide of Ammonium 360 grains, Iodide of Potassium 180 grains, Iodide of Ammonium 180 grains, Carbonate of Ammonium 120 grains, Tincture of Columba 3 fl.ounces, Water sufficient to make a pint. Dose, 1½ teaspoonful before meals, 3 teaspoonfuls at bed-time.

2164. Fothergill's Asthma Mixture.—Iodide of Ammonium 240 grains, Bromide of Ammonium 360 grains, Syrup of Tolu 6 fl.ounces, Tincture of Lobelia 10 fl.ounces. Mix and dissolve. Dose, a teaspoonful.

2165. Hoffmann's Balsamic Mixture—*Mixtura Oleoso-Balsamica, G. P.*—*Hoffmann's Balsam of Life.*—Oil of Lavender, Oil of Cloves, Oil of Cinnamon, Oil of Thyme, Oil of Lemon, Oil of Mace, Oil of Orange Flowers, each 1 part, Balsam of Peru 3 parts, Alcohol 240 parts. Mix them and set the mixture aside for several days in a cool place, shaking occasionally, then filter.

2166. Hope's Camphor Mixture.—Tincture of Opium 80 minims, Nitrous Acid 120 minims, Camphor Water a pint. Dose, a tablespoonful every two hours, for dysentery.

2167. Paris' Carminative Mixture.—Calcined Magnesia ½ ounce av., Peppermint Water 2½ fl.ounces, Compound Tincture of Lavender ½ fl.ounce, Spirit of Caraway 4 fl.ounces, Syrup of Ginger 2 fl.ounces. Mix. Dose, 2 to 4 fl.drachms.

2168. Richard's Chalk Mixture.—Precipitated Chalk 480 grains, Sugar 410 grains, Tincture of Opium 1 fl.drachm, Spirit of Cinnamon 15 minims, Compound Tincture of Lavender 1 fl.ounce, Tincture of Kino 1 fl.ounce, Water 3 fl.ounces. Mix them. Dose, a teaspoonful or more.

2169. Jackson's Cholera Mixture.—Spirit of Lavender Compound 2 fl.ounces, Spirit of Camphor 2 fl.ounces, Tincture of Opium 1 fl.ounce, Spirit of Ether Compound 1 fl.ounce. Mix them. The dose is ½ to a teaspoonful.

2170. Jackson's Cough Mixture or Syrup.—Sassafras Pith 60 grains, Gum Arabic 1 ounce av., White Sugar 28 ounces av., Muriate of Morphine 8 grains, Water 1 pint, or sufficient. Put the Sassafras Pith and Gum Arabic in the Water and let stand 12 hours, with frequent stirring, then strain, and dissolve the Sugar in the liquid by stirring. The dose is a teaspoonful.

2171. Sparkman's Cholera Mixture.—Camphor 1 drachm, Kino 2 ounces, Catechu ½ ounce, Powdered Cinnamon 2 ounces, Powdered Cloves 1 ounce, Powdered Capsicum 2 ounces, Brandy 1½ pint, Tincture Opium 2½

fl.ounces, Chloroform 1 fl.ounce. Macerate for two weeks, and filter. Dose, $\frac{1}{2}$ to 1 teaspoonful.

2172. Sun Cholera Mixture.—Tincture of Opium, Tincture of Capsicum, Tincture of Rhubarb, Spirit of Camphor, Spirit of Peppermint, each 1 fl.ounce. Mix them. The dose is a teaspoonful in water.

2173. Chapman's Copaiba Mixture.—Copaiba 4 fl.ounces, Acacia, powdered, 120 grains, Sugar 60 grains, Spirit of Nitrous Ether 4 fl.ounces, Compound Tincture of Lavender 2 fl.ounces, Tincture of Opium 1 fl.drachm, distilled Water 4 fl.ounces. Mix. Dose, a tablespoonful.

2174. Alkaline Copaiba Mixture.—Copaiba 4 fl.drachms, Acacia 240 grains, Sugar 240 grains, Solution of Potassa 4 fl.drachms, Spearmint Water sufficient to make 8 fl.ounces. Mix the Copaiba and Solution of Potassa and rub with the Water, Acacia, etc.

2175. Copaiba, Santal, and Cubeb Mixture—*Nesbit's Specific.*—Oil of Santal 5 fl.drachms, Oil of Copaiba 4 fl.drachms, Oil of Cubeb 4 fl.drachms, Oil of Pimenta 1 fl.drachm, Oil of Cassia 1 fl.drachm, Alcohol sufficient to make 16 fl.ounces. Mix and dissolve. Dose, a teaspoonful in water or syrup.

2176. Pancoast's Cough Mixture.—Wild Cherry Bark 240 grains, Senega 240 grains, Ipecac 120 grains, Extract of Conium 15 grains, Compound Tincture of Cardamom 1 fl.ounce, Compound Spirit of Juniper 1 fl.ounce, Water sufficient to make 10 fl.ounces. Percolate the Bark and Roots with sufficient Water to make 8 fl.ounces. Rub the Extract of Conium with the percolate and add the other ingredients. The dose is 1 to 2 teaspoonfuls.

2177. Gould's Diarrhœa Mixture.—Compound Tincture of Rhubarb 1 fl.ounce, Tincture of Opium 4 fl.drachms, Spirit of Camphor 2 fl.drachms, Water of Ammonia 1 fl.drachm, Oil of Peppermint 30 minims. Mix them. Dose, a teaspoonful in hot sweetened water.

2178. Squibb's Diarrhœa Mixture—Compound Tincture of Opium.—Tincture of Opium 1 fl.ounce, Tincture of Capsicum 1 fl.ounce, Spirit of Camphor 1 fl.ounce, Purified Chloroform 3 fl.drachms, Alcohol sufficient to make 5 fl.ounces. Mix them. The dose is 20 to 60 minims.

2179. Velpeau's Diarrhœa Mixture.—Tincture of Opium 1 fl.ounce, Tincture of Rhubarb 1 fl.ounce, Camphorated Tincture of Opium 1 fl.ounce, Spirit of Peppermint $1\frac{1}{4}$ fl.ounce, Tincture of Capsicum $\frac{3}{4}$ fl.ounce. Mix them. The dose is 20 to 60 minims.

2180. Laville's Gout Mixture.—Sulphate of Quinine 30 grains, Sulphate Cinchonine 22 grains, Extract of Colocynth 195 grains, Diluted Alcohol 3 fl.ounces, Red Wine sufficient to make 16 fl.ounces. Mix them and dissolve. The dose is a tablespoonful.

2181. Tully's Iron and Conium Mixture.—Subcarbonate of Iron 600 grains, Extract of Conium 300 grains, Sugar 8 ounces, Oil of Cassia 18

minims, Oil of Gaultheria 20 minims, Compound Tincture of Cinnamon 2 fl.ounces, Tincture of Tolu 4 fl.drachms, Water sufficient to make a pint. Mix them.

2182. Gadberry's Spleen Mixture. — Nitrate of Potassium 300 grains, Sulphate of Quinine 65 grains, Sulphate of Iron 65 grains, Nitric Acid 65 minims, Water sufficient to make a pint. Mix them and dissolve. Dose, a tablespoonful 3 times a day.

2183. Townsend's Mixture—(New-York Hospital). —Red Iodide of Mercury 1 grain, Iodide of Potassium 300 grains, Syrup of Orange Peel 2 fl.ounces, Compound Tincture of Cardamom 2 fl.drachms, Water sufficient to make 4 fl.ounces. Dose, 1 to 4 teaspoonsful for Syphilis.

MUCILAGINES—MUCILAGES.

Mucilages, as they are understood in pharmacy, are thick viscid liquids, prepared by dissolving gums or other vegetable substances, containing mucilage, in water, either cold or by the aid of heat. They are used in medicine chiefly for suspending more active medicinal substances, for soothing irritated internal or external surfaces and for their local action as palliatives.

In pharmacy they are used for making pill masses, troches, emulsions, mixtures, etc.

The gum mucilages are also extensively used as adhesives for labels, papers, etc., and some of the other mucilages are employed as a base for toilet preparations, such as bandoline, fragrant cream, etc.

The Mucilages official in the U. S., Br. and German Pharmacopœias are as follows:

2184. Mucilago Acacia.

Mucilage of Acacia.

The U. S. formula is: Acacia in small fragments, 34 parts or 4 ounces av., Water, sufficient to make 100 parts or 9 fl.ounces. Wash the Acacia with cold water, then add to it 66 parts or $7\frac{1}{2}$ fl.ounces of Water, and agitate occasionally until it is dissolved, and strain.

The Br. P. directs Acacia 4 ounces, and Distilled Water 6 fl.ounces. The G. P. directs 1 part of the Gum to 2 parts of Water.

In making Mucilage of Acacia for medicinal use the best quality of Gum Arabic should be selected; for making "Mucilage" for adhesive purposes inferior Gum is used.

Uses.—In pharmacy Acacia Mucilage is used for making emulsions, many masses, mixtures and compounds. In medicine it is employed as a vehicle for suspending powders and other kinds of medicine.

2185. Mucilago Amyli. Br.

Mucilage of Starch.

Starch, 120 grains or 24 parts.

Distilled Water, 10 fl.ounces or 875 fl.parts.

Triturate the Starch, with the Water gradually added; then boil for a few minutes, constantly stirring.

Uses.—This is a bland Mucilage, which may be used for the administration of irritating medicines.

2186. Mucilago Cydonii. U. S.

Mucilage of Cydonium or Quince.

Cydonium (Quince Seed), . . . 2 parts or 72 grains.

Distilled Water, 100 parts or 16 fl.ounces.

Macerate the Cydonium for half an hour in a covered vessel with the Distilled Water, agitating frequently, then drain the liquid through muslin without pressure.

Uses.—In pharmacy this Mucilage is frequently used as a bland vehicle for the administration or application of other medicines, for which it is well fitted, especially for applications to the eye. Made with double the quantity of the Seeds and longer maceration it forms an admirable base for several popular toilet preparations, as fragrant cream, bandoline, etc., which see.

2187. Mucilago Salep. G. P.*Mucilage of Salep.*

Salep, in fine powder, 1 part.

Water, 100 parts.

Shake the Salep with 10 parts of cold Water, and add 90 parts of boiling Water, mixing them well together. This is similar to Starch Mucilage.

2188. Mucilago Sassafras Medullæ. U. S.*Mucilage of Sassafras Pith.*

Sassafras Pith, 2 parts or 72 grains.

Water, 100 parts or 8 fl.ounces.

Macerate for three hours and strain.

Uses.—This Mucilage has the flavor of Sassafras, and is used chiefly in cough mixtures.

2189. Mucilago Tragacanthæ.*Mucilage of Tragacanth.*

The U. S. formula is :

Tragacanth, 6 parts or 190 grains.

Glycerin, 18 parts or 1 fl.ounce.

Water sufficient to make . 100 parts or 8 fl.ounces.

Mix the Glycerin with 76 parts or 5½ fl.ounces of Water ; heat the mixture to boiling, add the Tragacanth and let it macerate for 24 hours, stirring occasionally ; then add enough Water to make 100 parts or 8 fl.ounces ; beat it to a uniform consistence and strain forcibly through muslin.

The Br. formula is Tragacanth, in powder, 60 grains, distilled Water 10 fl.ounces, rectified Spirit 2 fl.drachms. Mix the Tragacanth with the Spirit, then pour in the Water with constant agitation.

Uses.—Tragacanth Mucilage is used chiefly as an excipient for pills and to mix with troches and other substances required to be made into a mass. It is also employed as an adhesive for labels, etc.

2190. Mucilago Ulmi. U. S.

Elm, sliced and dried, . . . 6 parts or 216 grains.

Boiling Water, 100 parts or 8 fl.ounces.

Macerate for two hours in a covered vessel and strain.

Uses.— Elm Mucilage is a favorite domestic remedy for coughs and irritation of the throat, taken as a drink *ad libitum*.

Other Mucilages.

Mucilages are sometimes made from other mucilaginous substances, the principal ones being as follows:

2191. Mucilage of Fenugreek.— Digest 1 part of Fenugreek Seed in 10 parts of Water for 12 hours, then boil and strain.

2192. Mucilage of Linseed.— Digest 1 part of Linseed (Flaxseed) in 6 parts of warm Water for 6 hours, stirring occasionally, and strain.

2193. Mucilage of Liquorice.— Pour 6 parts of boiling Water on 1 part of Liquorice Root, cut in fine pieces, and, after a few hours, strain.

2194. Mucilage of Marsh Mallow.— Make in the same proportion and manner as the preceding.

NICCOLUM — NICKEL.

Symbol, Ni; Atomic weight, 38; Sp. gr., 8.9.

Nickel is a metal classed chemically with cobalt and tin, obtained from ores found in different parts of the world by fusing them and separating the Nickel by various means. It is hard, white, malleable and magnetic, resembling silver, but harder, being therefore better adapted for plating, for which it is extensively used. It forms alloys with copper and zinc, known as German Silver, Albata, etc. (482), which are much employed as a basis for silver-plated ware. It is also used as a coin of small denomination, in the United States. Its salts are not used in medicine, but some of them are extensively used in silver-plating solutions.

The following are the principal salts of Nickel:

2195. Acetate of Nickel— $\text{Ni}(\text{C}_2\text{H}_3\text{O}_2)_2$.—By adding Carbonate of Nickel to Acetic Acid until neutralized, concentrating and crystallizing.

2196. Bromide of Nickel— NiBr_2 .—By neutralizing Hydrobromic Acid with Carbonate of Nickel, concentrating and crystallizing.

2197. Carbonate of Nickel— NiCO_3 .—This may be made by adding Carbonate of Sodium to a solution of Chloride of Nickel and collecting the precipitate, or by heating Chloride of Nickel with Carbonate of Sodium in sealed tubes.

2198. Chloride of Nickel— NiCl_2 .—By neutralizing Hydrochloric Acid with Carbonate of Nickel, concentrating and crystallizing, or by heating Nickel filings to low redness in a current of Chlorine. *Double Chlorides* of Nickel with Ammonium, Potassium or Sodium, may be made by combining solution of Chloride of Nickel with Solution of Chlorides of the substances named.

2199. Cyanide of Nickel— NiCN_2 .—By adding a solution of Cyanide of Potassium to a solution of any Nickel Salt in slight excess and collecting the precipitate.

2200. Hydrate of Nickel— $\text{Ni}(\text{HO})_2$.—By precipitating a solution of any soluble Salt of Nickel with Caustic Potassa. This may be dissolved in Acids for making any of the Soluble Nickel Salts.

2201. Oxides of Nickel.—With Oxygen Nickel forms two oxides, the *Monoxide*, NiO , being of an olive-green color, and the *Sesquioxide*, Ni_2O_3 , a black powder.

2202. Sulphate of Nickel— NiSO_4 .—By dissolving Carbonate or Oxide of Nickel in Sulphuric Acid diluted with water, concentrating and crystallizing. This salt is obtained in pale-green crystals, and is much used for nickel-plating.

Double Sulphates of Nickel with Ammonium, Potassium and Sodium, may be made by mixing a solution of Sulphate of Nickel with a solution of the Sulphates of the other substances. The Double Salts of Nickel, as they are called, are much used for nickel-plating.

NITROGENIUM — NITROGEN.

Symbol, N.; Atomic weight, 14; Sp. gr. 0.97.

Nitrogen is a colorless, odorless and tasteless gaseous element, discovered in 1722 by Rutherford, and found to be a constituent of the atmosphere (of which it forms about four-fifths), by

Lavoisier, in 1755. It is also called *Azote*. It is an essential part of nearly all animal matter, and enters largely into the composition of vegetable substances, and in the form of salts forms an important portion of alluvial soils. In the atmosphere it serves the purpose of diluting the oxygen. In a free gaseous state its qualities are neutral and negative, but combined with other elements it forms very energetic compounds. With hydrogen only one combination is known — Ammonia, NH_3 — from which are derived a great number of valuable substances; with carbon it forms Cyanogen, CN , the basis of a class of poisonous salts. Its combinations with oxygen are of the greatest importance, forming acids which unite with bases to produce *Nitrites* and *Nitrates*. It is also an essential constituent of all alkaloids, and many other principles of plants.

Nitrogen is most readily obtained by boiling a solution of Nitrate of Ammonia and collecting the vapor, which consists of water and nitrogen gas.

Oxides of Nitrogen.

With Oxygen, Nitrogen forms 5 distinct compounds, which are as follows :

2203. Nitrous Oxide or Laughing Gas — *Monoxide of Nitrogen* — N_2O . — This is made by heating fused Nitrate of Ammonium, free from Chloride, in a glass retort, to about 200°C . (392°F .), and gradually increasing the heat as the decomposition proceeds. The salt is decomposed into water and nitrous oxide, the gas is washed by passing through warm water. This is the popular exhilarant known as *Laughing Gas*, or *Hyponitrous Oxide*, which is inhaled before drawing teeth or other minor surgical operations.

2204. Nitric Oxide — *Deutoxide* or *Binoxide of Nitrogen* — NO . — This is most readily obtained by pouring Nitric Acid on copper shavings in a retort, effervescence ensues, and the arising gas, *Nitric Oxide*, is collected.

2205. Nitrous Anhydride — *Trioxide of Nitrogen* — N_2O_3 . — By heating Starch in powder, 1 part with Nitric Acid, sp. gr. 1.25, 8 parts, in a retort, and collecting the evolved gas, which must be passed through a long drying tube containing Chloride of Calcium, etc., and then condensed by cold to a blue liquid.

2206. Nitrogen Pentoxide or Nitric Anhydride — N_2O_5 . — The process for making this substance is difficult and tedious. It is obtained in colorless crystals, which melt at 86°F ., and boil at 115°F .

2207. Nitrogen Peroxide or Nitric Peroxide — N_2O_4 . — This may be obtained by heating dried Nitrate of Lead in a retort and condensing the gas

which is evolved, by cold. In the absence of any moisture it crystallizes in clear transparent crystals, but if any moisture be present it forms a liquid.

Nitrogen also combines with *Chlorine* and *Iodine*, forming explosive compounds, with Glycerin forming *Nitro-Glycerin*, with Benzol forming *Nitro-Benzol*, etc.

Acids of Nitrogen.

By absorbing or uniting with the elements of water, the two Anhydrides of Nitrogen form Acids as follows :

2208. Nitrous Acid — HNO_2 .— This is a solution of Nitrous Anhydride, N_2O_3 , in water. The commercial Nitrous Acid, which is usually dispensed for this is a reddish acid containing Nitric Acid with Nitrogen Tetroxide, N_2O_4 . The fumes which arise when Nitric Acid is boiled are principally Nitrous Acid. Nitrous Acid combines with bases forming *Nitrites*, and is sometimes employed in medicine for external use chiefly.

2209. Nitric Acid — HNO_3 .— This Acid is formed by the addition of the elements of water to Nitric Anhydride or Nitric Oxide, $\text{N}_2\text{O}_5 + \text{H}_2\text{O} = (\text{HNO}_3)_2$. The U. S. P. describes it as a liquid compound of 69.4 per cent. of Absolute Nitric Acid and 30.6 per cent. of Water. This description corresponds to the C. P. or 43° Nitric Acid. Commercial Nitric Acid is known as 38° Acid, and contains more or less acids of lower oxidation. It is also known as *aqua fortis*, and is used to combine with bases forming *Nitrates*, and in medicine largely diluted as a tonic and astringent. (See page 62.)

Nitric Acid is the commercial bases of the Nitrates, and is made by distilling Nitrate of Sodium or Potassium with concentrated Sulphuric Acid.

Fuming Nitric Acid, or *Nitroso-Nitric Acid*, is Nitric Acid containing a considerable amount of Hyponitric Acid. Commercial Nitrous Acid is a weak preparation of this composition.

Aqua Regia is a mixture of 3 parts of Nitric Acid with 4 parts of Hydrochloric Acid. It is a solvent for gold.

OLEA — OILS.

Under this heading is classed a great variety of substances ranging from liquids to solids, and obtained from the mineral, animal, and vegetable kingdoms. They are very properly divided pharmaceutically into *Fixed Oils*, which are obtained by expression from fatty bodies, and *Volatile Oils*, which are mainly obtained by distillation, and these again may be arranged in several groups according to their characteristics,

manner of making, etc. To these classes may be added the *Mineral Oils*, which, though not officially recognized, are considerably used in pharmacy, and many *Mixed* and *Medicated Oils*, which have their uses in the art.

Fixed Oils.

Fixed Oils are fatty bodies either liquid or solid, obtained, usually by expression, from vegetable or animal substances of a fatty nature. They differ from Volatile Oils by having a greasy feeling to the touch, while Volatile Oils do not, and by leaving a permanent oily spot on paper, while Volatile Oils do not. Volatile Oils are also vaporized by a degree of heat which will boil water, while the Fixed Oils remain unchanged.

In the arts, the Fixed Oils, both of vegetable and animal origin, are extensively used for many industrial purposes, but in pharmacy no animal oils, except lard oil and cod liver oil, are officially recognized.

The Fixed Oils and fats are, chemically, oxides of glyceryl or compound ethers, produced by the union of the fatty acids peculiar to each substance with glycerin (glyceric alcohol). They consist generally of the neutral principles, *Olein*, $C_3H_5(C_{18}H_{33}O_2)_3$, which is liquid, combined with *Palmatin* or *Stearin*, which, when separate, are solids at ordinary temperatures, but when combined with Olein are soluble in it at ordinary temperatures, but are congealed at lower temperatures, making many of the Fixed Oils solid in winter and fluid in summer. *Margarin* is considered a mixture of Stearin with other like principles. These neutral principles may be decomposed into Glycerin and *Oleic Acid*, $C_{18}H_{34}O_2$, *Stearic Acid*, $C_{18}H_{36}O_2$, and *Palmitic Acid*, $C_{16}H_{32}O_2$.

Fixed Oils are obtained by pressing the fatty substances, either with or without the aid of heat, in strong layer presses, by which the oily liquids are separated from the more solid fatty matters, or from the solid constituents of seeds, etc. Some of the Fixed Oils (especially flaxseed oil) are also obtained by solution in naphtha, which is afterwards evaporated, leaving the Fixed Oil.

The following are the Fixed Oils official in the U. S., Br., and German Pharmacopœias :

2210. Oleum Adipis—Lard Oil.—A Fixed Oil obtained by expression from lard at a low temperature. This is known on the market as summer-strained and winter-strained Lard Oil, the winter-strained being pressed at a much lower temperature and therefore remaining fluid at lower temperatures than the former. Lard Oil is used as a lubricant and in pharmacy for making citrine ointment, hair oil, etc.

2211. Oleum Amygdalæ Expressum—Expressed Almond Oil.—A Fixed Oil expressed from sweet or bitter Almond. The Almonds are deprived of the colored powder adhering to them, by rubbing together, or are blanched, then ground in a mill and the meal enclosed in strong linen bags and pressed between warmed iron plates. The yield is 35 to 40 per cent. The sp. gr. 0.915 to 0.920. Used for making rose-water ointment and whenever a fine bland Oil is required.

2212. Oleum Cocos. G. P.—Coco-Nut Oil.—A Fixed Oil expressed from the seed-kernels of *Coca Nucifera*, having a white color and the consistence of butter. This is considerably used as a lubricant and emollient. It has the odor of coconut.

2213. Oleum Gossypii Seminis—Cotton Seed Oil, U. S.—A Fixed Oil expressed from the seed of *Gossypium herbaceum* and subsequently purified. The kernels of Cotton Seed are separated from their testa, ground, and the oil expressed by powerful pressure. It is then purified by treating and filtering, and put upon the market under various names, and for various purposes. The ordinary Cotton Seed Oil is largely used to adulterate Linseed Oil and Olive Oil, and is sold as cheap Paint Oil and Sweet Oil. The finer grades are known as Salad Oil, Union Salad Oil, etc. Although directed for making several liniments, etc., in the U. S. P., it has not proven very satisfactory. It is considerably used as a base for hair oil.

2214. Oleum Lauri—Expressed Oil of Laurel, G. P.—An oil expressed from the fruit of *Laurus Nobilis*, of the consistence of lard, and consisting both of fixed and volatile oils. It is dark-green and aromatic.

2215. Oleum Lini—Flaxseed Oil, Linseed Oil.—A Fixed Oil expressed from flaxseed without the use of heat. This Oil is now mostly made by treating or percolating the ground flaxseed with naphtha, and then distilling off the naphtha, the Linseed Oil being left in the boiler of the still and subsequently purified. Linseed Oil is extensively used for painting and other industrial purposes, and in pharmacy for making liniments, etc., and internally as a laxative.

2216. Oleum Morrhue—Cod Liver Oil.—A Fixed Oil obtained from the fresh livers of *Gadus Morrhua*, or other species of *Gadus*. This Oil is prepared in the cod-fishing districts by heating the fresh livers in a wooden

tank by means of steam. The oils and other matters are drained off and separated by standing, and the Oil filtered, then cooled or frozen that it may deposit the heavier fats, then pressed in linen bags to obtain the pure light oil. Cod Liver Oil is extensively used in medicine, plain and combined in many ways. The dose is a teaspoonful to a tablespoonful. This is often prescribed by the name *Oleum Jacoris Aselli*, its German-Latin title.

2217. Oleum Myristicæ Expressum—*Expressed Oil of Nutmeg.* Br.—A concrete Oil obtained by means of expression and heat from Nutmeg. This is of the consistence of lard and is called *Myristicæ Adeps*, also *Butter of Nutmeg*. The German-Latin title is *Oleum Nucistæ*. It is used as a vehicle for other medicines.

2218. Oleum Olive—*Olive Oil.*—A Fixed Oil expressed from the ripe fruit of *Olea Europæa*. This Oil has been extensively used in pharmacy in all countries, and is an important article of commerce. The finer grades, which are obtained from the first expression of choice fruit, are called *Virgin Oil*; the cheaper grades are made after the Virgin Oil has been expressed by heating the cake with boiling water and strong expression. Imported *Salad Oil* is a fine quality of Olive Oil. In pharmacy it is used in liniments, plasters, and ointments, and for many other purposes. The color of Olive Oil is from a light straw to a greenish yellow. It sp. gr. is about 0.917.

2219. Oleum Papaveris—*Poppy Oil.* G. P.—A Fixed Oil expressed from the seeds of *Papaver somniferum*. This is a very bland Oil, free from irritating qualities and albuminous matter. It is sometimes employed in medicine and is used for fine painting and to oil watches, etc. It is frequently sold as *Watchmakers' Oil*.

2220. Oleum Rapæ—*Oil of Rape Seed.* G. P.—A Fixed Oil obtained by expression from the seeds of the cultivated varieties of *Brassica* or Rape. This is a bland Oil, used for the same purposes as Oil of Cotton Seed or Mustard.

2221. Oleum Ricini—*Castor Oil.*—A Fixed Oil expressed from the seed of *Ricinus Communis*. The seeds or beans of the Castor Oil plant are crushed and subjected to powerful pressure, and then purified by heating with water to remove albuminous matter. The clear Oil is then filtered and constitutes the cold-pressed Castor Oil of Commerce. An inferior quality is made by pressing the cake between heated plates. Castor Oil is a well-known cathartic in doses of a teaspoonful to a flounce. It is much more effective in the form of an emulsion. It mixes with alcohol in all proportions and is considerably used as a base for hair oil, mixed 2 parts of Oil with 1 part of alcohol.

2222. Oleum Sesami—*Oil of Sesamum*—*Oil of Benné.* U. S.—A Fixed Oil expressed from the seeds of *Sesamum Indicum*. This is a bland, odorless Oil, similar to Oil of Almond or Olive Oil, and may be used for similar purposes. It is highly esteemed as a base for hair oil.

2223. Oleum Sinapis Expressum — *Expressed Oil of Mustard*. — A Fixed Oil obtained by expression from the seeds of *Sinapis alba* or *nigra*. This Oil very much resembles Cotton Seed Oil. It is made chiefly in California, and is used as a base for hair oil and other similar purposes.

2224. Oleum Theobromæ — *Oil of Theobroma, Butter of Cacao*. — A Fixed Oil expressed from the seeds of *Theobroma Cacao*. This Oil resembles tallow, and is made by pressing the kernels or nibs of the chocolate nut between hot iron plates and running the Oil into moulds. It is used in pharmacy for making suppositories, for which it is best adapted of any substance having a low melting point (86° to 95° F.), and a firm consistence when cold. It is sometimes used in ointments, and is a favorite requisite for the toilet for rubbing over the face, hands, lips, etc.

2225. Oleum Tiglii, U. S. Oleum Crotonis, Br. P. and G. P. — A Fixed Oil expressed from the seed of *Croton Tiglium*. This Oil is employed externally as a rubefacient and vesicant. Internally it is a powerful purgative in doses of 1 drop. It is sometimes combined in pills, but seldom given in any other form on account of its irritating effect.

The following are official formulæ for preparations containing a Fixed Oil as a solvent of medicinal agents. For Oleum Sulphuratum, see page 186.

2226. Oleum Cantharidatum — *Cantharides Oil*. G. P. — Cantharides 3 parts, Oil of Rape Seed 10 parts. Digest for 10 hours on a steam-bath, express and filter. This is applied as a vesicant and rubefacient.

2227. Oleum Hyoscyami — *Hyoscyamus Liniment*. G. P. — Hyoscyamus, cut, 4 parts, Alcohol 3 parts. Macerate for a few hours, then add Olive Oil 40 parts, and digest on a steam-bath, stirring occasionally, until the Alcohol is evaporated. Finally, express and strain. This is used as a sedative soothing application. Other medicated Oils prepared in a similar manner are classed as OLEA COCTA. Either green or dried plants are used, and they may be prepared either with or without alcohol to aid in extracting the properties of the drugs. Oil of Belladonna, Capsicum, Colocynth, Elder leaves, also called Green Oil or Oil of Swallows, Digitalis, Conium, etc., are made as above.

2227. Oleum Phosphoratum — *Phosphorated Oil*. — The U. S. formula is : Phosphorus 1 part, Stronger Ether 9 parts, expressed Oil of Almond sufficient to make 100 parts. Introduce a sufficient quantity of the Almond Oil into a flask, heat it on a sand-bath to 250° C. (482° F.) and keep it at that temperature for 15 minutes, then allow to cool and filter it. Put 90 parts of the filtered Oil together with the Phosphorus, previously well dried by blotting paper, into a dry bottle capable of holding somewhat more than 100 parts, insert the stopper and heat the bottle in a water-bath until the Phosphorus melts, agitate it until the Phosphorus is dissolved and allow it to cool, then add the Ether.

The Br. formula directs 16 grains of Phosphorus to be dissolved in 4 fl.ounces of Oil of Almonds, in a similar manner, but Ether is not used.

Phosphorated Oil contains 1 per cent. of Phosphorus, and is given in doses of 3 to 5 minims, usually in the form of an emulsion.

Other Fixed Oils.

Besides the official Fixed Oils which have been mentioned, quite a number which have no official recognition are used in pharmacy. The following are the most important:

Animal Oils.

2228. Oleum Animale Æthereum — Dippel's Animal Oil.— This was formerly official in the P. G. It is obtained by dry distillation from bones and animal substances, and is known as *bone oil*. It has a very fetid odor, which is removed by rectifying, the purified oil being used in smelling salts, etc.

2229. Bear's Oil or Bear's Grease.— This is obtained by "trying out" the internal fat of the bear. It resembles lard, and is much esteemed as a base for hair pomade, a popular article of this kind being known as "*Ursina*." *Goose Oil*, *Hen's Oil*, *Rattlesnake Oil*, *Skunk Oil*, and *Woodchuck Oil*, are all made in a similar manner, and are used in domestic medicine externally for swellings, rheumatism, etc., and sometimes internally for croup, etc.

Angleworm Oil.— This may be made by putting a quantity of Angleworms in a bottle, covering them with Olive Oil and keeping them exposed to sunshine for several days until a sediment has separated. The Oil is then decanted and filtered or strained. This may also be made by "trying out" the Oil by heat. It is a domestic remedy for rheumatism, stiff joints, etc.

Lanolin is a fatty Oil obtained from the washings of wool, and now considerably used as an ointment base. It is more readily absorbed than other fats. It is also known by other names, as *Oleum Lanæ*, *Agnine*, etc.

2230. Neatsfoot Oil.— This is made by boiling the feet of cattle, deprived of their hoofs, in water and removing the Oil which rises to the surface, and after it has stood sometime in warm water straining it. This is used for softening leather, for stiff joints, etc., and in some liniments.

2231. Sperm Oil.— This is obtained from cavities in the head of the Sperm Whale, and is the source of Spermaceti. Sperm Oil when purified is extensively used as a lubricating oil for fine machinery. It constitutes the best *Sewing Machine Oil*. It is best purified by heating to coagulate any albuminous matter, then filtering, and then chilling with ice and pressing out in linen bags.

2232. Whale Oil.— An Oil obtained by "trying out" the "blubber" of the Whale. It is chiefly used for dressing leather. Many other *Fish Oils*

are used for similar purposes, as *Menhaden Oil*, *Porpoise Oil*, *Seal Oil*, *Shark Oil*, *Walrus Oil*, etc. *Dugong Oil* and *Eulachon Oil* have been proposed as substitutes for Cod Liver Oil, but are not used in this country.

Vegetable Oils.

2233. Nut Oils.— These are prepared, as a rule, by grinding the kernel or "meat" of the nuts to a coarse meal and expressing the Oil, either by cold expression or between heated iron plates. The Oils from nuts are generally bland and have an odor somewhat resembling the nuts from which they are obtained.

Beech-Nut Oil, Brazil-Nut Oil, Ground-Nut Oil, Hazle-Nut Oil, Hickory-Nut Oil, Walnut Oil, Peach-Pit Oil, and other similar Oils are obtained in this manner. Coco-Nut Oil, Candle-Nut Oil, Bayberry Oil, and other solid Oils are obtained by boiling the nuts or fruit in water, expressing while hot, and collecting the oil when cold from the surface.

2234. Oils from Seeds.— The Oils from seeds are prepared either by expression or by percolating the ground seeds with Naphtha, Ether, or some other solvent of the Oils and then evaporating the light substance by distillation, leaving the Oil in the boiler of the still, the latter process being usually preferred as it insures a larger yield of the Oil at a less expense. The following unofficial Oils are made in this manner :

Oil of Cardamom,	Oil of Melon Seed,
" Chaulmoogra,	" Niker Seed,
" Cucumber Seed,	" Pumpkin Seed,
" Ergot,	" Stramonium Seed,
" Hemp,	" Sunflower Seed,
" Hyoscyamus Seed,	" Tonka.
" Larkspur Seed,	

2235. Oils from Fruit.— The Oils from fruit are usually obtained by making the fruit into a pulp and steeping in water, then pressing and collecting the Oil which rises to the surface. *Palm Oil* is the most used of any unofficial Oil of this kind, large quantities being consumed in the manufacture of soap. *Mangosteen Oil*, *Behn Oil* and *Tucum Oil* are sometimes used.

Volatile Oils.

Volatile Oils are obtained from plants mainly by the process of distillation. They consist generally of the odorous principles of the plants from which they are obtained, and are therefore called *Essential Oils*. The term *Otto* instead of Oil is used in perfumery to designate the Essential Oils, as being less liable to mislead when there are Fixed and Essential Oils from the same substance.

The Volatile Oils are divided chemically into several classes:

Hydrocarbons or *Terpenes*, which consist of carbon and hydrogen (usually $C_{10}H_{16}$), of which Oil of Turpentine is the type.

Oxygenated Oils, which contain oxygen combined with the hydrocarbon radical, and of which Cinnamon Oil is an example.

Sulphurated Oils, which contain Sulphur combined with a hydrocarbon radical, of which Volatile Oil of Mustard is an example.

Nitrogenized Oils, which contain Hydrocyanic Acid, or Nitrogen combined with a Hydrocarbon radical, of which Essential Oil of Almond and its associates are all that are known.

Many of the Volatile Oils which have chemically the same composition are entirely different in odor and other characteristics. For example, Oil of Turpentine, Oil of Orange, Oil of Lemon, and Oil of Bergamot, are all terpenes, having the chemical formula $C_{10}H_{16}$, their difference consisting only in the arrangement of the Carbon and Hydrogen atoms in the molecule.

Volatile Oils consist generally of two parts, which volatilize or congeal at different temperatures, as would a mixture of alcohol and water. The lighter or more ethereal portion may be separated by distillation at a moderate temperature, and is much more soluble than the heavier portion which remains behind. By congealing or freezing many of the Oils a solid matter is obtained, which is called *Stearopten*. This may be collected and separated from the Oil by pressure.

The *terpenes* are designated by the termination *ene*, as *thymene* and the *stearoptens* by the termination *ol*, as *thymol*.

The methods employed for obtaining the Essential Oils of plants are such as experience has shown to be best suited to the nature of the substance from which the Oil is obtained and the character of the product required.

Distillation by Steam is the most approved method for obtaining the Volatile Oils of most plants. It consists in forcing steam through the mass of green or partly dried plants contained in a suitable chamber with a perforated bottom to

properly distribute and admit the steam, and collecting the vapor which rises in a suitable condenser, and afterward separating the Oil from the surface of the water by means of woolen blankets, or by dipping off into a separating funnel.

Distillation with Water.—Some Oils are volatilized at a temperature lower than that of boiling water, and may be obtained by heating in water to nearly its boiling point, and condensing the vapor which rises. Most of the Volatile Oils may be obtained by distilling the plants with water, but the yield is not so large as by steam distillation. In distilling many of the Oils with water, salt should be added to produce a higher degree of heat, and thereby more completely volatilize the heavier portions of the Oil. Sufficient water should be added, as a rule, to cover or nearly cover the substances from which the Oil is to be distilled, and a false bottom or rack should be used to keep the plants from burning on the bottom of the boilers.

Distillation from Substances.—Pitch, tar, resins, the balsams, gum-resins, and other substances are distilled without the aid of water or steam by simply heating them in the boiler and condensing the vapor which rises. Oil of Turpentine, Oil of Copaiba, and Oil of Tar, are examples of this class. Petroleum Oils are refined in this manner, and the volatile products of coal and other substances are made by dry or destructive distillation of the crude substances.

Mechanical Means.—The Citrine Oils, Orange, Lemon, and Bergamot, are best obtained by pricking the rinds of the fruit and thus liberating the Oil contained in the oil cells. This is most conveniently done by means of the *Ecuelle*, which consists of a large number of sharp-pointed nails arranged in a shallow disc or cup. The fruit is rotated over these points, thereby rupturing the oil cells and liberating the Oil, which is collected in the *ecuelle*. These Oils, and also the Volatile Oils of some other fruits and seeds, are also obtained by grinding and expressing and subsequently separating the Oils from the other liquid matter. These Oils may also be obtained by distillation, but their flavor is thereby impaired.

Other Methods.—The foregoing methods of obtaining the Essential Oils of plants are all that are generally employed, but some odorous principles of

substances are so volatile, or so prone to decomposition, that they cannot be obtained by the processes described. The fresh plants are therefore *macerated* in some bland Oil, as Almond Oil, or *digested* by the aid of gentle heat in the same, imparting to the bland Oil their odorous principles. These are known as *Fatty Oils*, as Fatty Oil of Jasmine. When digested in deodorized alcohol or cologne spirit in the same manner, or when the Oils thus perfumed are digested with cologne spirit, the product is known as *Spiritous Oil*. The process of *Enfleurage* is also extensively employed for obtaining the odorous principles of delicate flowers. It consists of spreading fresh flowers on thin layers of purified lard or other fat and changing them as frequently as their odor has been absorbed for fresh flowers of the same kind. The products are called *Flower Pomades*, and are known as No. 24 or No. 30, according to the number of times the flowers have been changed. These pomades are used for making the *Extracts* or *Extrait*s which are employed in perfumes, their spiritous solutions being sometimes called Spiritous Oils.

The odors of flowers are sometimes obtained by percolating or macerating with Bisulphide of Carbon or Ether and afterward distilling the percolate, leaving the heavier odorous substances in the boiler.

Official Volatile Oils.

The following are the Volatile Oils official in the U. S., Br., and German Pharmacopœias. They are but a small portion of the Essential Oils that are used, but are all that are used to any extent in medicine:

2236. Oleum Amygdalæ Amaræ — *Oil of Bitter Almond*.—This is a nitrogenized Volatile Oil obtained from bitter Almond by moistening with water the cake left after expressing the Fixed Oil, and, after standing, distilling by means of steam. The substance obtained is *Benzyl-Aldehyd*, which is formed by the action of *Emulsin* on *Amygdalin* in the presence of water.

Nitrobenzol (293) or *Oil of Myrbane* has been extensively manufactured as an artificial Oil of Bitter Almond, but only used for flavoring cheap soaps and coarse products, but now an artificial benzyl-aldehyd, which is identical with Oil of Bitter Almond, is made by the action of chlorine upon toluol (C_7H_8), the benzyl-chloride which is formed is distilled with nitrate of lead and water in an atmosphere of carbonic acid gas, and benzyl-aldehyd results.

Uses.—This Oil is used chiefly as a flavoring. It is sedative and poisonous except in very small quantities. The true Oil of Almonds usually contains hydrocyanic acid.

2237. Oleum Anethi — *Oil of Dill*. Br.—An Oil distilled from dill fruit and used for flavoring. It contains a terpene *Anethene*, $C_{10}H_{16}$, having a lemon flavor and an oxygenated substance similar to carvol.

2238. Oleum Anisi — *Oil of Anise*.— This Oil is distilled in Europe from Aniseed, *Pimpinella Anisum*, the Russian Oil being most esteemed, and in China from star anise, *Illicium Anisatum*, the great majority of the commercial Oil being from the latter. It consists mainly of *Anethol*, $C_{10}H_{12}O$, of which one portion, *Anise Camphor*, congeals at ordinary temperature and is heavier than water, and the other, *liquid Anethol*, is lighter than water and remains liquid at a much lower temperature than the former. It also contains a small percentage of hydrocarbon $C_{10}H_{16}$. Anise is used as a flavoring, sedative, and carminative. The dose is 2 to 5 minims.

2239. Oleum Anthemidis — *Oil of Chamomile*. Br.— This Oil is distilled from chamomile flowers, and has their characteristic odor. It is stimulant and antispasmodic. The dose is 1 to 5 minims.

2240. Oleum Aurantii Corticis — *Oil of Orange Peel*.— Several varieties of orange yield a Volatile Oil from their peel, which is generally obtained by puncturing it with the ecuelle. The most common variety is obtained from the sweet orange and known as Oil of Orange or *Oil of Sweet Orange*. The common varieties of bitter orange yield an *Oil of Bitter Orange*, and a choice variety yields the Oil of *Curaçoa*. These Oils have the same composition as terpene, $C_{10}H_{16}$, and are prone to change when exposed to light and air, acquiring a terebinthine odor. These Oils are extensively used for flavoring and in making elixirs, colognes, etc.

2241. Oleum Aurantii Florum — *Oil of Orange Flowers, Oil of Neroli*.— This is a Volatile Oil distilled from orange flowers, and consisting of a fragrant terpene, $C_{10}H_{16}$. The choicest variety is distilled from the flowers of the sweet orange, and is known commercially as Oil of Neroli, *Petale*. The next best is obtained from the blossoms of the bitter orange, and known as Oil of Neroli, *Bigarade*, and an inferior kind is made from the leaves and unripe fruit, known as Oil of Neroli, *Petit grain*.

Oil of Neroli is used for preparing orange flower water and in cologne and other perfumes.

2242. Oleum Bergamii — *Oil of Bergamot*.— This Oil is prepared from the fresh rind of the fruit of citrus *Bergamia* in the same manner as Oil of Orange Peel previously described. It is, like it, a terpene, $C_{10}H_{16}$, and develops a terebinthine odor when exposed. It is used extensively in cologne and perfumery, and is a popular flavor for hair oils, etc.

2243. Oleum Cajuputi — *Oil of Cajuput*.— A Volatile Oil distilled from the leaves of *Melaleuca Cajuputi*. In composition it is a hydrate of the terpene *Cajuputene*, its formula being $C_{10}H_{16}H_2O$. It is a warm aromatic, having an odor like camphor, and is used internally in cholera mixtures and externally in liniments.

2244. Oleum Calami — *Oil of Calamus*.— A Volatile Oil, distilled from the rhizome of *Acorus Calamus*. It is a warm aromatic, possessing the odor and properties of the root. It is used for flavoring and as an addition to stomachics, etc.

2245. Oleum Cari, U. S., Oleum Carui, Br., Oleum Carvi, G. P. — *Oil of Caraway*.—A Volatile Oil, distilled from Caraway, consisting of a terpene *Carvine*, $C_{10}H_{16}$, and *Carvol*, $C_{10}H_{14}$. In the market are found two kinds, *Oil of Caraway Seed*, and *Oil of Caraway Chaff*; the former being much finer and more expensive than the latter, and should always be used for flavoring. It is an aromatic oil used for flavoring, and in making elixirs and some liquors, syrups, etc.

2246. Oleum Carophylli — *Oil of Cloves*.—A Volatile Oil, distilled from Cloves, and consisting of a light oil or terpene, $C_{10}H_{16}$, and another heavier than water, called *Eugenol*, $C_{10}H_{12}O_2$, in which the odor and taste of Cloves is concentrated. It is a warm aromatic, much used for toothache and neuralgic pain, and is given internally in painkillers, etc.

2247. Oleum Chenopodii — *Oil of Chenopodium, Oil of American Wormseed*.—A Volatile Oil, distilled from Chenopodium, and consisting of a terpene, $C_{10}H_{16}$, and an oxidized terpene, $C_{10}H_{16}O$. It is a peculiar very disagreeably flavored Oil, used as an anthelmintic. Some of the popular Vermifuges are made chiefly of this oil, mixed with some bland oil and aromatics. The dose is 5 to 10 drops.

2248. Oleum Cinnamomi — *Oil of Cinnamon*.—The U. S. P. recognizes two varieties of Cinnamon Oil, *Oil of Ceylon Cinnamon* and *Oil of Chinese Cinnamon* or *Cassia*. Their composition and properties are similar, both containing *Cinnamic Aldehyd*, C_9H_8O . When old this is converted by oxidation into *Cinnimic Acid*, $C_9H_8O_2$, and it may be still further oxidized by the addition of Nitric Acid yielding Benzyl Aldehyd (Oil of Bitter Almonds) and Benzoic Acid, $C_7H_6O_2$. Oil of Cinnamon is extensively used as a flavoring, and in medicine as a quick stimulant. The dose is 1 or 2 drops.

2249. Oleum Copaibæ — *Oil of Copaiba*.—A Volatile Oil distilled from Copaiba, and consisting of Hydrocarbons $C_{10}H_{16}$ and $C_{15}H_{24}$. It is used for the same purposes as Copaiba, but has no advantages over it. The dose is 10 to 15 drops.

2250. Oleum Coriandri — *Oil of Coriander*.—A Volatile Oil, distilled from Coriander, and containing an oxygenated terpene, $C_{10}H_{18}O$. It is an agreeable aromatic, and is considerably used in elixirs, syrups, and carminative preparations. The dose is 1 to 5 minims.

2251. Oleum Cubebæ — *Oil of Cubebs*.—A Volatile Oil, distilled from Cubebs, and consisting mainly of two oils, with different characteristics. It is a warm aromatic and stimulant, especially for the mucous membrane, and is much used in medicines for Catarrh and bronchitis, and in catarrh of the bladder, etc. Dose, 5 to 15 minims.

2252. Oleum Erigerontis — *Oil of Erigeron, Oil of Fleabane*.—A Volatile Oil distilled from the fresh flowering herb of *Erigeron Canadense*, and consisting of a terpene and an oxygenated portion. It has a peculiar disagreeable odor, and is used in gonorrhœa and, in the form of an ointment or lotion, for piles, etc.

2253. Oleum Eucalypti — *Oil of Eucalyptus*.— A Volatile Oil distilled from the leaves of *Eucalyptus Globulus*. It consists chiefly of *Eucalyptol*, $C_{10}H_{16}O$, and is an aromatic stimulant, having a spicy taste. The dose is 5 to 10 minims for bronchial troubles, catarrh, etc.

2254. Oleum Fœniculi — *Oil of Fennel*.— A Volatile Oil distilled from fennel and having much the same properties and composition as Oil of Anise. The dose is 1 to 5 minims.

2255. Oleum Gaultheriæ — *Oil of Wintergreen*.— A Volatile Oil, heavier than water, distilled from Gaultheria, and containing about 90 per cent. of *Methyl Salicylate* and 10 per cent. of the terpene *Gaultherilene*. A great portion of the Oil of Wintergreen found in the market is distilled from birch twigs. It is also prepared artificially from methyl alcohol and salicylic acid. A *Gaultherio-Salicylic Acid* is prepared from Oil of Wintergreen which is much different in appearance from the commercial salicylic acid prepared from phenol.

Oil of Wintergreen is much used as a flavoring, which is also known as *Chickerry*.

2256. Oleum Hedomæ — *Oil of Pennyroyal*.— A Volatile Oil distilled from pennyroyal herb, similar in composition to the other mint Oils. It is used as a stimulant and flavoring and in mixtures for preventing the bite of flies, mosquitos, etc. It is given in doses of 1 to 3 minims.

2257. Oleum Juniperi — *Oil of Juniper*.— The official Oil of Juniper should be distilled from the berries, and consists mainly of a terpene $C_{10}H_{16}$. It is used as a flavoring for some preparations and in medicine as a diuretic and a stimulant. The dose is from 5 to 15 drops.

Oil of Juniper Wood has more of a terebinthene odor and is inferior.

Empyreumatic Oil of Juniper or *Oil of Cade* is a tar-like liquid obtained from juniper by destructive distillation. It is frequently directed as *Juniper Tar*.

2258. Oleum Lavendulæ — *Oil of Lavender*.— A Volatile Oil distilled from the flowering tops or whole herb of *Lavandula Vera*, and consisting of terpene and oxygenated compounds. A great difference exists in the Lavender Oil found in the market, its fragrance varying with the part of the plant used, the Oil of Lavender flowers being the finest. It is much used in perfumery and somewhat employed in medicine.

The U. S. P. recognizes two Oils of Lavender, the Oil of Lavender as above described and the *Oil of Lavender Flowers* distilled from fresh Lavender (flowers). The Br. P. directs only the latter, the best quality of which is distilled from cultivated lavender, at Mitcham, England.

2259. Oleum Limonis — *Oil of Lemon*.— A Volatile Oil obtained from fresh lemon peel, usually by means of the *ecuëlle*, and consisting of a terpene $C_{10}H_{16}$. It is extensively used as a flavoring and in cologne, etc. This Oil soon develops a terebinthine odor when exposed to the light and air. It, as

well as Oils of Orange and Bergamot, should be kept in a cool, dark place, closely stoppered in full bottles or cans. They may be somewhat restored when changed by washing repeatedly with hot water in which a few grains of permanganate of potassium are dissolved. When freshly received, if practicable, these Oils should be put up in small bottles, full, and put away, or be mixed with one fourth their weight of Alcohol.

Oleum Limettæ or *Oil of Limes* is prepared from limes, and is similar to Oil of Lemon. It is used in flavoring confectionery, syrups, etc.

2260. Oleum Macidis—*Oil of Mace*. G. P.—A Volatile Oil distilled from Mace, and having the same properties as Oil of Nutmeg, which see.

2261. Oleum Menthæ Piperitæ—*Oil of Peppermint*.—A Volatile Oil distilled from peppermint, and consisting of a light hydrocarbon and *Menthol*, $C_{10}H_{20}O$, to which it owes its odor and properties. It is extensively used in medicine and for flavoring. The dose of the Oil is 1 to 3 drops.

2262. Menthol—*Peppermint Camphor*.— $C_{16}H_{20}O$. A stearopten obtained from Peppermint Oil by chilling it with ice, separating the solid portion, pressing, purifying, and crystallizing. The variety of Menthol obtained from *Mentha Arvensis* is official in the Br. P. It is known as *Japanese Menthol* or *Camphor*, and is most esteemed. A Menthol is obtained from the ordinary Peppermint Oil, which is called *Pip-Menthol*, and is extensively used in this country. In the form of *Menthol Cones* Menthol has become a popular proprietary application for pain, neuralgia, etc. These cones are moulded and fastened into suitable holders of wood, horn or other substance.

2263. Oleum Menthæ Viridis—*Oil of Spearmint*.—A Volatile Oil distilled from spearmint and consisting of a terpene, $C_{10}H_{16}$, and an oxygenated portion, $C_{10}H_{14}O$, in which the characteristic odor resides. It is somewhat used as a flavoring and a little used in medicine as a carminative and stimulant. The dose is 2 to 5 drops.

2264. Oleum Myricæ—*Oil of Bay*.—A Volatile Oil distilled from the leaves of *Myrcia Acris* and consisting of a terpene, $C_{10}H_{16}$, and *Eugenol*, $C_{10}H_{12}O_2$. It is chiefly used for making "Bay Rum," and in perfumery.

2265. Oleum Myristicæ—*Oil of Nutmeg*.—A Volatile Oil distilled from nutmeg, consisting of a terpene and oxygenated portion, which represents the flavor of the nutmeg. It is used chiefly for flavoring and in some elixirs, etc. Oil of Mace is similar.

2266. Oleum Picis Liquidæ—*Oil of Tar*.—A Volatile Oil distilled from tar, containing a variety of constituents. It is preferable for many medicinal purposes to tar and is used in making several official syrups, etc., and in cough remedies. The dose is 1 to 3 minims in emulsion or syrup. An *Oil of Birch Tar* is made from birch tar by distillation.

2267. Oleum Pimentæ—*Oil of Pimento*.—A Volatile Oil distilled from Pimento and containing a terpene and eugenol. It is similar in characteristics to Oil of Cloves, and is considerably used in flavoring.

2268. Oleum Pini Sylvestris—*Fir-Wood Oil*. Br.—An Oil distilled from the fresh leaves of *Pinus Sylvestris*, having the characteristic odor of pine leaves and consisting mainly of terpenes. It may be used in making cough preparations, etc.

2269. Oleum Rosæ—*Oil of Rose*.—Also called Otto of Rose, and Attar of Rose. A Volatile Oil distilled from the fresh flowers of *Rosa Damascena*. This Oil consists of a liquid portion and a stearopten and is solid or semi-solid at ordinary temperatures. The best Otto of Rose is obtained from Turkey, Kizanlic being the chief collecting centre. Oil of Rose is used in pharmacy for many purposes and extensively employed in perfumes.

2270. Oleum Rosmarini—*Oil of Rosemary*.—A Volatile Oil distilled from rosemary and containing terpene and Oxygenated compounds. It is stimulant and aromatic and is used to some extent in pharmacy and medicine.

2271. Oleum Rutæ—*Oil of Rue*.—A Volatile Oil distilled from *Ruta Graveolens*, the most soluble in water of all the official Oils. It is given for colic, female disorders, etc., in doses of 2 to 5 minims.

2272. Oleum Sabinæ—*Oil of Savin*.—A Volatile Oil distilled from Savine. It is a terpene and has the same general properties as Savine, acting as a stimulant to the organs of generation. It is sometimes given as an abortive.

2273. Oleum Santali—*Oil of Santal*.—A Volatile Oil distilled from santal wood, and consisting of oxygenated compounds. It is similar in its action to copaiba and is used as a stimulant for the mucous membrane, for gonorrhœa, and catarrhal conditions. It is also used in perfumery to give permanence to odors. The dose is from 5 to 15 minims.

2274. Oleum Sassafras—*Oil of Sassafras*.—A Volatile Oil distilled from the bark of sassafras root and consisting of a terpene, *Safrene*, $C_{10}H_{16}$, and an oxygenated portion, *Safrol*, $C_{10}H_{10}O_2$, which constitutes about 90 per cent. of the Oil. This Oil is an agreeable aromatic, largely used in liniments and pain-killers, also as a flavoring. When compounded with winter-green and anise it makes the sarsaparilla flavoring so much used. The dose of Oil of Sassafras is 2 to 10 minims.

2275. Oleum Sinapis Volatile—*Volatile Oil of Mustard*.—A Volatile Oil distilled from black mustard, after the expression of the Fixed Oil, and maceration with water. This is a sulphurated Oil, known chemically as *Sulphocyanide of Allyl*. (See page 134.) It is heavier than water and has a very pungent, acrid odor. Mixed with alcohol or oils in liniment it is used as a counter-irritant and rubefacient.

2276. Oleum Succini—*Oil of Amber*.—A Volatile Oil, obtained by the destructive distillation of Amber and subsequently purified by rectification. This is called Rectified Oil of Amber, the unpurified oil being the crude. It is considerably used in liniments as an irritant and stimulant, and has the same composition as Oil of Turpentine.

2277. Oleum Terebinthinæ — Oil of Turpentine.—A Volatile Oil, distilled from Turpentine, and having the composition $C_{10}H_{16}$. It is a type of the terpenes. It is familiarly known as "Turpentine" or "Spirits of Turpentine," and is extensively used in the arts and in medicine. It is an ingredient of most of the proprietary liniments, and is a valuable stimulant and rubefacient. It is also given internally in various forms in doses of 2 to 10 minims. It is much employed as a solvent for resins, etc.

Terebene is a light hydrocarbon obtained from Oil of Turpentine, by mixing it with one-twentieth of its weight of Sulphuric Acid, and distilling over at 160° F. It is used for coughs, etc.

An Oil is distilled from *Strassburg Turpentine* and also from *Venice Turpentine*.

2278. Oleum Terebinthinæ Rectificatus — Rectified Oil of Turpentine, G. P.—This is the ordinary Oil of Turpentine, rectified by shaking with 6 times its weight of lime-water, and then distilling about three-fourths of the Oil of Turpentine which was used. It is employed in medicine for the same purposes as Oil of Turpentine.

2279. Oleum Thymi — Oil of Thyme.—A Volatile Oil, distilled from *Thymus Vulgaris*, and commercially known as *Oil of Origanum*. It is composed of *Cymene*, $C_{10}H_{14}$, *Thymene*, $C_{10}H_{26}$, and *Thymol*, $C_{10}H_{14}O$, a stearopten, which crystallizes. This Oil is extensively used in liniments as a stimulant and rubefacient. As found in the market, it is adulterated with Oil of Turpentine or other dilutents. Red Oil of Thyme is known as Pure Origanum Oil, and White Oil of Thyme is used in perfumery.

2280. Thymol — $C_{10}H_{12}HO$.—A stearopten obtained from various species of Oil of Thyme by saponifying with Caustic Soda, separating the saponaceous substance and decomposing with Hydrochloric Acid, washing the crystalline mass with Water, dissolving it in hot Alcohol, and recrystallizing. It is used as an antiseptic, and also for neuralgia, toothache, etc.

2281. Oleum Valerianæ — Oil of Valerian.—A Volatile Oil, distilled from Valerian, consisting of a terpene and an oxygenated compound, having the characteristic odor and taste of Valerian. It is employed for making Valerianic Acid, and is sometimes used in medicine.

Unofficial Volatile Oils.

The foregoing official Volatile Oils embrace the greater part of those used in pharmacy, but several that are not recognized by the pharmacopœias are considerably used, and, as nearly all odorous plants yield Volatile Oils in some form, it is obvious that the list of such Oils must be very large, and only the more important ones can be mentioned here. The methods employed for obtaining them have been previously mentioned.

UNOFFICIAL VOLATILE OILS.

No.	Commercial Name.	Distilled From.	Part Used.	Chief Composition.
2285	Oil of Angelica	Angelica, varieties.	Root or seed...	Oxygenated.
2286	Angustura	Angustura	Bark	Oxygenated.
2287	Arnica	Arnica Montana	Flowers	Oxygenated.
2288	Asafetida	Asafetida	Gum-resin	Sulphurated.
2289	Balm Mint	Melissa or Balm	Leaves and tops	Oxygenated.
229	Balsam Fir	Canada Turpentine	Oleo-resin	Terpene.
2291	Birch	Betula	Young twigs	Oxygenated.
2292	Birch Tar	Betula	The tar	Terpene.
2293	Buchu	Buchu	Leaves	Oxygenated.
2294	Burgundy Pitch	Abies Excelsa	Prepared pitch	Terpene.
2295	Camphor	Camphora Officinarum	Crude camphor	Oxygenated.
2296	Canada Snake Root	Asarum Canadense	Root	Oxygenated.
2297	Canella	Canella Alba	Bark	Oxygenated.
2298	Capsicum	Capsicum	Fruit (pods)	Oxygenated.
2299	Cardamom	Elettaria Cardamomum	Fruit (seed)	Oxygenated.
2300	Carrot	Daucus Carota	Fruit (seed)	Oxygenated.
2301	Cascarilla	Croton Eluteria	Bark	Oxygenated.
2302	Catmint	Nepeta Cataria	Flowering tops	Oxygenated.
2303	Cedar	Juniperus Virginiana	Leaves	Oxygenated.
2304	Cedarwood	Juniperus Virginiana	Wood	Oxygenated.
2305	Cedrat	Citrus Medica	Fruit rind	Terpene.
2306	Celery	Apium Graveolens	Fruit (seed)	Oxygenated.
2307	Cherry Laurel	Laurocerasus	Leaves	Nitrogenat'd
2308	Citronella	Andropogon Schœnanthus	Leaves	Oxygenated.
2309	Cognac	Fermented Grapes	Wine	Oxygenated.
2310	Coto	Coto	Bark	Oxygenated.
2311	Cress	Lepidium Sativum	The seeds	Sulphurated.
2312	Cumin	Cuminum Cyminum	Fruit (seed)	Hydrocarb'n
2313	Cuscus	Vitvert	Rhizome	Oxygenated.
2314	Cyna	Artemisia Martima	Flowering tops	Oxygenated.
2315	Dahlia	Dahlia Pinnata	Tubers	Oxygenated.
2316	Elder	Sambucus, varieties	Flowers	Oxygenated.
2317	Elemi	Canarium Commune	Gum-resin	Terpene.
2318	Feverfew	Pyrethrum Parthenium	Plant	Oxygenated.
2319	Galangal	Alpinia Officinarum	Rhizome	Oxygenated.
2320	Garlic	Allium Sativum	Bulb	Sulphurated.
2321	Geranium Rose	Pelargonium odoratissima	Leaves	Oxygenated.
2322	Ginger	Zingiber Officinale	Rhizome	Oxygenated.
2323	Ginger Grass	Andropogon Schœnanthus	Flowers	Oxygenated.
2324	Golden Rod	Solidago Odora	Leaves and tops	Oxygenated.
2325	Gurjun Balsam	Dipterocarpus	Oleo-resin	Terpene.
2326	Hedge Garlic	Alliaria Officinalis	Bulb	Sulphurated.
2327	Heliotrope	Heliotropium	Flowers	Oxygenated.
2328	Hemlock	Abies Canadensis	Leaves	Terpene.
2329	Hops	Humulus Lupulus	Strobiles	Terpene.
2330	Hoarhound	Marrubium Vulgare	Leaves and tops	Terpene.
2331	Horsemint	Monarda Punctata	Leaves and tops	Terpene.
2332	Horseradish	Cochlearia Armoracia	Root	Sulphurated.
2333	Hungarian Turpentine	Pinus Pumilio	Oleo-resin	Terpene.
2334	Hyssop	Hyssopus Officinalis	Herb	Oxygenated.
2335	Indian Cannabis	Cannabis Sativa	Flowering tops	Oxygenated.
2336	Inula	Inula Helenium	Root	Oxygenated.
2337	Jaborandi	Pilocarpus Pennatifolius	Leaflets	Terpene.
2338	Lemon Grass	Andropogon Citratis	The plant	Oxygenated.
2339	Limette or Limes	Citrus Limetta	Fruit rind	Terpene.
2340	Lilac	Syringa Vulgaris	Flowers	Oxygenated.
2341	Lily of the Valley	Convallaria Majalis	Flowers	Oxygenated.
2342	Linden	Tilia	Flowers	Oxygenated.
2343	Lobelia	Lobelia Inflata	Herb	Oxygenated.
2344	Lovage	Levisticum Officinal	Root	Oxygenated.
2345	Marjoram	Origanum Marjorana	Flowering plant	Oxygenated.
2346	Marrubium	Marrubium Vulgare	Flowers	Oxygenated.

UNOFFICIAL VOLATILE OILS — Continued.

No.	Commercial Name.	Distilled From.	Part Used.	Chief Composition.
2347	Oil of Marsh Tea.....	Ledum Palustra.....	Leaves	Oxygenated.
2348	Masterwort	Heracleum Lantanum.....	Leaves	Oxygenated.
2349	Matricaria	Matricaria Chamomile....	Flowers	Oxygenated.
2350	Matico.....	Artanthe Elongata.....	Leaves	Oxygenated.
2351	Melissa	Melissa Officinalis.....	Leaves and tops	Oxygenated.
2352	Mountain Balm.....	Eriodictyon Californica....	Leaves.....	Oxygenated.
2353	Myrrh.....	Balsamodendron Myrrha....	Gum-resin.....	Oxygenated.
2354	Olibanum.....	Boswellia Carterii.....	Gum-resin.....	Oxygenated.
2355	Parsley.....	Petroselinum Saturni.....	Fruit, seed.....	Oxygenated.
2356	Patchouly.....	Pogostemon Patchouly.....	Flowers	Oxygenated.
2357	Phellandrium.....	Ceanthe Phellandrum.....	Fruit, seed.....	Oxygenated.
2358	Rhodium	Convulvulus Scoparius ..	Root.....	Oxygenated.
2359	Sage	Salvia Officinalis.....	Leaves	Terpene.
2360	Saffron.....	Crocus Sativum.....	Flowers	Oxygenated.
2361	Sagapanum.....	Ferula Persica.....	Plant.....	Sulphurated.
2362	Serpentaria.....	Aristolochia Serpent.....	Roots	Oxygenated.
2363	Spruce or Hemlock....	Abies Canadense.....	Leaves	Terpene.
2364	Spike Lavender.....	Lavandula Spica.....	Herb	Oxygenated.
2365	Smartweed	Polygonum Punctatum.....	Herb	Oxygenated.
2366	Stillingia	Stillingia Sylvatica.....	Root	Oxygenated.
2367	Sweet Basil.....	Ocimum Basilicum.....	Herb	Oxygenated.
2368	Sweet Cicily.....	Osmorhiza Longistylus.....	Herb	Oxygenated.
2369	Sweet Marjoram.....	Origanum Marjorina.....	Herb	Oxygenated.
2370	Sweet Violet.....	Viola Odorata.....	Flowers	Oxygenated.
2371	Summer Savory	Satureja Hortensis.....	Herb	Oxygenated.
2372	Tansy.....	Tanacetum Vulgare.....	Leaves	Oxygenated.
2373	Tea.....	Thea Chinensis.....	Leaves	Oxygenated.
2374	Thuja.....	Thuya Occidentalis.....	Twigs.....	Oxygenated.
2375	Tobacco.....	Nicotiana Tabacum.....	Leaves	Oxygenated.
2376	Verbena (Lemon Grass)	Andropogon Citratis.....	Flowering herb	Oxygenated.
2377	Water Plantain.....	Alisma Plantago.....	Plant.....	Oxygenated.
2378	Wild Ginger.....	Asarum Canadense.....	Rhizome.....	Oxygenated.
2379	Wormwood.....	Artemisia Absinthium	Leaves and tops	Oxygenated.
2380	Yarrow.....	Achillea.....	Plant.....	Oxygenated.
2381	Ylang Ylang.....	Onona Odoratissima.....	Flowers	Oxygenated.
2382	Zedoary	Curcuma Zedoaria	Rhizome.....	Oxygenated.

Mixed Oils.

Under this heading are included such preparations of Oils as cannot well be classified elsewhere, but for which there is a demand and use:

2383. Acoustic Oil.—Oil of Almonds 6 parts, Oil of Turpentine 1 part. Mix. Used for deafness, etc.

2384. British Oil.—Oil of Origanum 1 drachm, Oil of Rosemary 1 drachm, Barbadoes Tar 2 flounces, Oil of Turpentine 5 flounces. Mix them. Used as an application and also internally.

2385. Haarlem Oil.—Oil of Amber, crude, 1½ drachm, Crude Petroleum 1 drachm, Sulphurated Oil, Balsam of Sulphur (276), 3 drachms, Linseed Oil 4 drachms, Oil of Turpentine 1 ounce. Mix them. This celebrated Oil is used externally and internally for everything.

2386. Oil of Spike.—The Oil of Spike which is usually sold and dispensed for liniments is a mixture composed of Barbadoes Tar and Oil of Turpentine, the proportions varying somewhat as made by different houses. Oil of Turpentine 3 pints, Barbadoes Tar 1 pint, makes about the average mixture. This Mixed Oil should not be confounded with the Oil distilled from *Lavendula Spica*, which is sold as Oil of Origanum.

2387. Oil of Rhodium, factitious.—The true Oil of Rhodium is distilled from Rhodium Wood, but what appears in the market is generally made by mixing Otto of Rose with Oil of Santal Wood or Balsam of Copaiba, about 1 part of the former to 20 of the latter. It is considerably sold as a scent for hunting bees, and is used in perfumes.

2388. Oil of Ambergris and Oil of Musk are made by digesting 2 drachms of Ambergris or Musk for some time in 20 flounces of Purified Almond Oil.

2389. Oil of Benzoin and Oil of Styrax, and other Oils of gums, balsams or resins, are made by digesting 1 ounce of the substance with a pint of Purified Oil, either Almond, Benne or Olive.

2390. Fatty Oils.—Oil of Jasmine, Hyacinth, Jonquil, Tuberose, Violet and many other delicate flowers, may be made by digesting the fresh flowers with the purified oil, and changing the flowers several times for fresh ones, until the Oil is highly perfumed with the odors of the flowers.

Mineral Oils.

The name "Mineral Oils" is intended to apply to the Hydrocarbons Oils, which are obtained from the distillation of coal and the oils obtained from the earth by drilling or otherwise. The Mineral Oil formerly used for illuminating, and obtained by distillation from coal and other bituminous substances was known as *Coal Oil* or *Kerosene*, but the discovery of *Petroleum Oil* revolutionized that industry, and our illuminating oils are now almost entirely obtained by distillation from *Crude Petroleum*, which is obtained from oil wells in various parts of the world. The Illuminating Oil is obtained by fractional distillation, and is familiarly known as *Carbon Oil*. The crude oil is used in liniments and as an application for rheumatism, etc.

Lubricating Oils are also made from the heavier portions of Petroleum, and are frequently mixed with Animal or Vegetable Oils.

Paraffin Oils are obtained from Petroleum after the distillation of the illuminating oil by pressing the solid paraffines obtained from the residue. They are used extensively for lubricating, and, when purified, for various pharmaceutical purposes, making a good body for an oil liniment, for hair oil, etc.

Seneka Oil.—This is a variety of Crude Petroleum Oil which was formerly obtained from the surface of some streams by the Seneka Indians, who absorbed it with woolen blankets and then obtained it by wringing them

out. Crude Petroleum Oil, which has stood exposed in shallow vessels for some time, is very similar to it, and is now used altogether when Seneka Oil is required.

Rock Oil and Oil of Stone are very similar, and Old Crude Petroleum is altogether sold for them now.

Barbadoes Tar is a thick Petroleum, resembling thin tar, exuding from the earth, and obtained from Barbadoes and other countries. Its properties are similar to other heavy Petroleums. It is used as an application for rheumatism, and in liniments, etc.

OLEATA — OLEATES.

Oleates are liquid, semi-solid, or solid preparations, made by combining basic substances with oleic acid. The official oleates, of which there are but two only, are liquid; but the name Oleate is used in pharmacy to designate a salt, which may be either liquid or solid, produced by the combination of oleic acid with metals or alkaloids.

The Oleates are employed in medicine as a means of applying medicinal agents, as they are thought to be more readily absorbed than ointments. The following are official in the U. S.:

2391.

Acidum Oleicum.

Oleic Acid.



Oleic Acid, which is the acid basis of the Oleates, is obtained from fats (64). Crude Oleic Acid is called "Red Oil," the refined is a light amber color. This Acid combines with metallic bases and alkaloids in the same manner as other acids forming the salts called Oleates. The liquid Oleates, which are used as applications, contain Oleic Acid in large excess, but the solid and dry Oleates which have been precipitated from solutions of metals by soluble Oleates are satisfied chemical combinations. They may be mixed with Oleic Acid to form liquid Oleates.

2392. Oleatum Hydrargyri, U. S.*Oleate of Mercury.*

Yellow Oxide of Mercury, thor-

oughly dried, 1 part or 60 grains.

Oleic Acid, 9 parts or 540 grains.

Heat the Oleic Acid contained in a porcelain vessel to near 74°C . (165.2°F .), taking care not to exceed that temperature; gradually add the Oxide of Mercury, and stir until dissolved.

This Oleate contains 10 per cent. of the Oxide of Mercury. Oleate of Mercury may also be made containing 5 per cent., 15 per cent. or 20 per cent. of Mercury, the two latter being of the consistence of ointment, and keeping better than the former. A Precipitated Oleate of Mercury is also prepared, see 2409.

Uses.—This Oleate is used as an alterative and absorbent, the same as Mercury Ointment.

2393. Oleatum Veratrinae. U. S.*Oleate of Veratrine.*

Veratrine, 2 parts or 10 grains.

Oleic Acid, 98 parts or 490 grains.

Rub the Veratrine with a small quantity of the Oleic Acid in a warm mortar to a smooth paste, add this to the remainder of the Oleic Acid, heated in a porcelain capsule on a water-bath, and stir until it is dissolved.

This Oleate contains 2 per cent. of Veratrine. It may also be made 5 or 10 per cent., or other strengths, as may be desired.

Uses.—This is employed externally for neuralgia, rheumatic pain, etc.

Oleates of the Alkaloids.

Oleates may be made from any of the Alkaloids by dissolving them in an excess of Oleic Acid. It should be remembered that *salts* of the Alkaloids are not soluble in Oleic Acid. Only a few Oleates of the Alkaloids are

used, being intended only for external application. The following are those known in pharmacy.

2394. Oleate of Aconitine.—This is usually made of 2 per cent. strength. Aconitine 10 grains, Oleic Acid 490 grains, in the same manner as Oleate of Veratrine. Other strengths may also be made. This is applied for neuralgia, etc.

2395. Oleate of Atropine.—This is usually made 2 per cent. strength of the Alkaloid Atropine, in the same manner as Oleate of Veratrine. It is a valuable mydriatic, and is used in ophthalmic practice.

2396. Oleate of Cocaine.—This is usually made 2 per cent. strength of the Alkaloid Cocaine, in the same manner as Oleate of Veratrine. A 4 per cent. strength is also used. Used as a local anæsthetic and anodyne.

2397. Oleate of Morphine.—This Oleate is made of 2 per cent.; 5 per cent. and 10 per cent. strength of the Alkaloid Morphine, according to the uses desired, in the same manner as is directed for Oleate of Veratrine. It is used as an anodyne.

2398. Oleate of Quinine.—This Oleate is made 5, 10, 15, 20 or 25 per cent. strength of the Alkaloid Quinine, according to the uses desired.

2399. Oleate of Strychnine.—This Oleate is usually made 2 per cent. of the Alkaloid Strychnine, but may be made of other strengths if desired.

Oleates of other Alkaloids may be made in the same general manner as the foregoing.

Oleates of the Metals.

The most familiar example of an Oleate of a metallic substance is Castile Soap or Oleate of Sodium. With solutions made of Castile Soap or of Oleate of Potassium, Oleates of other metals may be precipitated from solutions of their salts with these solutions. Mr. Henry B. Parsons, in the *Druggists' Circular*, proposed the following solutions for this purpose, which cannot be bettered, and the formulæ which follow are mostly adapted from the same author:

2400. Solution of Sodium Oleate.—To 1 pound av. of best powdered Castile Soap add about one half gallon of distilled Water and stir well until an even and transparent mixture results. Then add more Water and heat until dissolved, making the finished, cooled, and slightly turbid solution measure 16 pints. Each pint of the solution contains 1 ounce of the Powdered Soap, which may for all purposes be considered as *Sodium Oleate*.

2401. Solution of Potassium Oleate.—To 1 gallon of boiling distilled Water add gradually in small portions 5 ounces av. of Bicarbonate of Potassium. When effervescence has ceased and the Bicarbonate has all been

transformed into normal Carbonate, add 14 ounces av. of purified Oleic Acid, continue a gentle heat with stirring and addition of Water, if necessary, until saponification is complete; cool and dilute to 16 pints. Each pint of the solution contains 1 ounce av. of *Potassium Oleate*.

2402. Aluminium Oleate— $\text{Al}_2(\text{C}_{18}\text{H}_{33}\text{O}_2)_6$.—Potash Alum 240 grains is dissolved in distilled Water 2 pints, and to the solution is slowly added 1 pint of Solution of Sodium Oleate. Warm the mixture until the Oleate separates, then draw off the liquid and wash the Oleate twice with 2 pints of warm distilled Water, then cool and separate the Water from the soft white Oleate.

2403. Arsenious Oleate— $\text{As}(\text{C}_{18}\text{H}_{33}\text{O}_2)_3$.—Dissolve 48 grains of lump Arsenious Acid in 1 pint of boiling Water by the aid of an equal weight (48 grains) of Bicarbonate of Potassium. To the cooled solution add 220 grains of Hydrochloric Acid, sp. gr. 1.16, or an equivalent amount of weaker Acid. This produces Arsenious Chloride in solution. Dilute this solution with 2 pints of distilled Water and slowly add to it 1 pint of Solution of Sodium Oleate, then warm the mixture until the Oleate separates, draw off the aqueous liquid and wash twice with boiling distilled Water. This Oleate has a yellowish color and the consistence of butter.

2404. Bismuth Oleate— $\text{Bi}(\text{C}_{18}\text{H}_{33}\text{O}_2)_3$.—Dissolve 280 grains Nitrate of Bismuth (tris nitrate 312) in 4 ounces av. of Glycerin, adding the Glycerin all at once to the powdered salt. Dilute 1 pint of Solution of Sodium Oleate with 2 pints of distilled Water and slowly add it to the Solution of Bismuth. Warm the mixture, pour off the aqueous layer and wash twice with warm distilled Water. This Oleate is of a cream color and has nearly the consistence of an ointment.

2405. Copper Oleate— $\text{Cu}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2$.—Dissolve 180 grains of crystallized Sulphate of Copper in 2 pints of distilled water, and add slowly 1 pint of Solution of Sodium Oleate. Heat the mixture to separate the Oleate, pour off the water, wash twice with warm distilled water as for making other Oleates. This is a dark-green, waxy Oleate.

2406. Iron Oleate.— $\text{Fe}_2(\text{C}_{18}\text{H}_{33}\text{O}_2)_6$.—Dilute 350 grains of Solution Tersulphate of Iron with 2 pints warm distilled water, and gradually add 1 pint of Solution of Sodium Oleate. Wash and separate the Oleate as directed. This is a dark-red, soft-solid Oleate.

2407. Lead Oleate.— $\text{Pb}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2$.—Dissolve 280 grains of Purified Acetate of Lead in 2 pints of distilled water, and gradually add to the solution 1 pint of Solution of Sodium Oleate. Boil the mixture, filter, reject the filtrate, and wash the precipitate twice with boiling distilled water. This is a white hard brittle Oleate.

2408. Maganese Oleate.—Dissolve 1 ounce av. of Sulphate of Manganese in 2 pints of warm water, and add to the solution 1 pint of Solution of Sodium Oleate, boil the mixture to separate the Oleate, and wash twice with distilled water. This Oleate is of a light-gray, pinkish color.

2409. Mercuric Oleate, Precipitated.— This is a true chemical Oleate of Mercury as distinguished from the U. S. P. Oleate of Mercury, which is simply a solution of Oxide of Mercury in excess of Oleic Acid. To 150 grains of Yellow Oxide of Mercury in a small evaporating dish add 130 grains of C. P. Nitric Acid. Then add 2 fl.ounces of Distilled Water and heat until the salt is dissolved, adding, if necessary to complete the solution, a few more drops of the Acid, but as little as possible for the purpose. Dilute the Solution thus prepared with 2 pints of Distilled Water, and add 1 pint of Solution of Potassium Oleate warm, and wash the separated Oleate with warm water as directed. This is a reddish-yellow, soft-solid Oleate, which may be diluted with Oleic Acid as desired. To make the 5 per cent. Mercuric Oleate, mix 125 grains with 375 grains of Oleic Acid. The 10 per cent., the same as the official, is made with 250 grains each of the Oleate and Oleic Acid. The 20 per cent. is made with 400 grains of the Precipitate Oleate warmed with 168 grains of Oleic Acid.

2410. Mercuric Oleate with Morphine.— This may be made by combining 2 per cent. of Morphine (Alkaloid) with a 5 per cent. Mercuric Oleate (2409) by the aid of gentle heat. A larger proportion of Morphine may be added if desired, or Morphine may be combined with a stronger Mercuric Oleate, 20 per cent. Oleate and 5 per cent. Morphine being a standard strength.

2411. Nickel Oleate.— Dissolve 1 ounce of Sulphate of Nickel in 2 pints of warm water, and add gradually 1 pint of Solution of Sodium Oleate, heating to separate the Oleate and washing as directed, with boiling distilled water. This is a green, waxy Oleate.

2412. Silver Oleate— $\text{Ag}(\text{C}_{18}\text{H}_{33}\text{O}_2)_3$.— Dissolve 245 grains of crystallized Nitrate of Silver in 2 pints of cold distilled water, and add very slowly, with constant stirring, one pint of Solution of Sodium Oleate, drain and wash several times with water. This Oleate should be prepared in a darkened room, as it is changed by exposure to light. It is white, dry and granular if properly prepared. It may be combined with Oleic Acid in any proportion to make a liquid Oleate of Silver.

2413. Tin Oleate.— This Oleate is made by adding a Solution of Chloride of Tin to the Solution of Oleate of Sodium, heating and washing the precipitate. It is of a grayish-yellow color and soft consistence.

2414. Zinc Oleate, in powder.— $\text{Zn}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2$.— Dissolve 180 grains of well-crystallized Acetate of Zinc in 2 pints of cold water, and add gradually, with rapid stirring, 1 pint Solution Oleate of Sodium. Drain on a wetted muslin strainer, wash several times with cold distilled water, and dry by exposure to air without heat. This Oleate is a soft white powder, having a soapy feel.

Liquid Zinc Oleate.— By adding this powdered Oleate to Oleic Acid in the same manner as is directed for making Mercury Oleate (2392) a liquid Oleate of any desired strength may be made. The 5 per cent. and $12\frac{1}{2}$ per cent. Oleates are those most generally used.

OLEORESINÆ — OLEO-RESINS.

Considered as galenicals, Oleo-resins are preparations made from vegetable drugs containing oleo-resinous principles by exhausting the drug of these principles with some ethereal solvent and then concentrating by distillation or evaporation until only the Oleo-resin remains. There are also natural Oleo-resins, exudates from trees, which are known as turpentine, balsams, and gums. In the earlier pharmacopœias of this country some of the preparations now known as Oleo-resins were called fluid extracts. The prepared Oleo-resins are used in pharmacy in pills, tablets, capsules, and other forms when concentrated principles of the kind are desired.

2415. General Process of the U. S. P.

From the formula given in the U. S. P. for Oleo-resins a general formula may be deduced as follows:

The substance, in No. 60 powder, . . . 100 parts.
Stronger Ether, a sufficient quantity.

Put the substance into a cylindrical glass percolator, provided with a cover and a receptacle suitable for volatile liquids, press it firmly and gradually pour stronger Ether upon it until 150 parts have slowly passed or until the drug is well exhausted of its Oleo-resin. Recover the greater part of the Ether by distillation on a water-bath and expose the residue in a capsule until the remaining Ether has evaporated. Keep the Oleo-resin in a well-stopped bottle, and shake when using.

2416. General Process by Water-Bath Percolation.

The substance, in No. 60 powder, . . . 100 parts.
Stronger Ether (or Gasoline), a sufficient quantity.

Put the substance in a water-bath percolator and cover it with stronger Ether or Gasoline; surround the percolator with

hot water, by pouring in the outer vessel, and after standing one hour begin to percolate, adding stronger Ether or Gasoline to the drugs in the percolator and continuing the percolation until 150 parts have passed, or until the drug is exhausted. Recover the greater portion of the stronger Ether or Gasoline by distillation and expose the residue in a capsule until all traces of the volatile liquid has evaporated. This may be hastened by the gentle heat of a water-bath.

In the point of economy Gasoline (Petroleum Ether) is infinitely cheaper, and (in our opinion) if the process is properly conducted, the product is just as good.

The following are the Oleo-resins now official and known in pharmacy :

2417. Oleoresina Aspidii — *Oleo-resin of Aspidium*.— Aspidium (male Fern) 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed. The product is about 2 fl.ounces. The dose is 30 to 60 minims for tape worm, etc.

2418. Oleoresina Capsici — *Oleo-resin of Capsicum*.— Capsicum 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed, separating and rejecting the fatty matter which is obtained with the Oleo-resin, by passing through a strainer. The product is about $\frac{3}{4}$ of an ounce and the dose $\frac{1}{4}$ to 1 minim. This is often called *Oil of Capsicum*.

2419. Oleoresina Cubebæ — *Oleo-resin of Cubeb*.— Cubeb 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed, and after standing separate the Oleo-resin from the sediment which subsides. The product is about 4 ounces, and the dose 5 to 20 minims for the same purposes as other preparations of Cubebs.

2420. Oleoresina Lupulini — *Oleo-resin of Lupulin*.— Lupulin 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed. The product is about 8 fl.ounces or 50 per cent. The dose 2 to 5 minims as a nervine and tonic.

2421. Oleoresina Piperis — *Oleo-resin of Pepper*.— Pepper 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed, and after standing separate the liquid portion from the crystallized *Piperine* by straining through muslin. The product is about 1 $\frac{1}{2}$ ounce and the dose $\frac{1}{4}$ to 1 minim. This was formerly called *Oil of Black Pepper*.

2422. Oleoresina Zingiberis — *Oleo-resin of Ginger*.— Ginger 100 parts or 16 ounces av., stronger Ether or Gasoline a sufficient quantity. Make as directed. The product is about 1 fl.ounce. The dose is $\frac{1}{2}$ to 1 minim, used for the same purposes as other preparations of ginger.

Other Oleo-resins.

Besides the foregoing official Oleo-resins many others may be obtained from plants containing oleo-resinous principles, as Allspice, Canada Snake Root, Horse Chestnut, Lobelia, Savin, etc., but they are seldom used. They may be made in the same manner as the official preparations. Asclepidin, Cyripedin, Iridin, Senecin, and Xanthoxylin are Oleo-resins prepared by eclectic manufacturing pharmacists.

Natural Oleo-resins.

Although these are not classed in the pharmacopœias with Oleo-resins it seems proper that they should be, as they are natural oleo-resinous exudates. The following are official under the titles as given:

2423.

Copaiba.

Balsam of Copaiba.

The Oleo-resin of Copaiba of different species is obtained by tapping the trees. It contains a volatile oil, which may be separated by distillation (Oil of Copaiba), a resin which is chiefly *Copaivic Acid*, $C_{20}H_{30}O_2$, and which is known as solidified Copaiba, and a bitter principle.

Copaiba is known commercially as "Balsam of Copaiba," two varieties being generally sold: Para, which is thin, containing a larger proportion of oil, and Angostura, thicker, containing more resin. The former is generally preferred.

Uses.—Copaiba is used in medicine as a stimulant to mucous surfaces and is the popular remedy for gonorrhœa. It is much used for catarrh of the bladder and other troubles of the urinary organs. It is also used extensively in stimulating ointments. In the arts it is used in some kinds of varnishes, printers' ink, etc.

2424.

Terebinthina.

Turpentine—Gum Turpentine—White Pine Turpentine.

A concrete Oleo-resin obtained from *Pinus Australis* and other species of *Pinus* by tapping the trees and collecting the exudate.

It contains 25 per cent. of volatile oil (Oil of Turpentine), which is obtained by distillation, leaving the residue, *Resin* or Colophony, which consists of Abietic Anhydride.

Uses.—White Pine Turpentine, as it is known in the market, is used in making plasters, and its solution in alcohol is employed in cough remedies.

2425. *Terebinthina Canadensis.*

Canada Turpentine—*Balsam Fir.*

A liquid Oleo-resin obtained from *Abies Balsamea* by puncturing the resin-ducts in the bark.

It contains a turpene, which may be obtained by distillation, and is known as Oil of Balsam Fir or Fir Oil, and a resin.

Uses.—Balsam of Fir, as it is most commonly called, is used in making stimulating ointments and plasters and in liniments. It is also used for making transfer varnishes, transparent or tracing paper, and for mounting microscopic objects, for which it is admirably adapted.

Other Oleo-resinous Substances.

Besides the foregoing official natural Oleo-resins, a few others, which are known commercially as balsams, gums, and turpentine, are mentioned.

2426. Bdellium.—A balsamic exudation from *Balsamodendron Mukul*, containing a volatile oil and resin, and some gum.

2427. Chian Turpentine.—A Oleo-resin or Turpentine obtained from incisions made in the bark of *Pistacia Terebinthus*, and recently considerably used in medicine.

2428. Elemi.—A concrete Oleo-resin obtained from *Canarium Commune* and containing about 10 per cent. of a volatile oil and 25 per cent. of resin.

2429. Gurjun Balsam.—An Oleo-resin consisting of volatile oil and resin, obtained from *Dipterocarpus Turbinatus*, somewhat similar to Copaiba, and used for similar purposes. It is also called *Wood Oil*.

2430. Hungarian Turpentine or Balsam.—An Oleo-resinous exudation from the branches of *Pinus Pumilia*. Its composition and uses are similar to Balsam of Fir.

2431. Strassburg Turpentine.—An Oleo-resin obtained, like Balsam of Fir, by puncturing the ducts of the bark of *Abies pectinata*. Its composition and uses are similar to Balsam of Fir.

2432. Venice Turpentine.—An Oleo-resinous exudation from the heartwood of *Larix Europæa*. Its composition and uses are similar to Balsam of Fir. *Factitious Venice Turpentine* may be prepared from common Resin 3 parts, Oil of Turpentine 1 part.

2433.

OPIUM.

Opium is the concrete milky exudation obtained in Asia Minor by incising the unripe capsules of the Opium Poppy, *Papaver Somniferum*. A few days after the petals have fallen incisions are made in the capsule, and in twelve to fifteen hours the milky exudation which has collected is scraped off and collected and afterward formed into masses as it appears in the market. The present U. S. P. specifies, when dried at the temperature of boiling water until it ceases to lose weight, that Opium shall yield at least 12 per cent. of Morphine, and that in its normal moist condition it should yield at least 9 per cent. of Morphine when assayed by the official process. The best grades of Opium frequently contain as high as 20 per cent. or even more of Morphine, and a good average quality should yield when dried 15 to 17 per cent. In pharmacy Opium is used in making many preparations, and is the source of many alkaloids and alkaloidal salts, which are extensively used. In medicine Opium and its preparations are more frequently employed than any other, except perhaps the preparations of Cinchona.

Opium and its preparations are mostly sedative and anodyne, and are used to allay pain, quiet excited nervous action, induce sleep, etc. The use of Opium and Morphine — although almost indispensable in medicine — is attended with great risk of forming the Opium habit, and physicians cannot be too cautious in employing them. They are good servants, but bad masters.

Powdered Opium.—To powder Opium it is first cut in pieces and dried by the heat of boiling water until it ceases to lose moisture. It is then powdered and assayed, the pharmacopœia directing that powdered Opium shall not contain more than 16 per cent. of Morphine, nor less than 12 per cent. If it contains more than the specified percentage, it is reduced to the proper standard by adding some inert substance, most manufacturers being content to fulfil the bare requirements of the pharmacopœia, and make it to contain 12 per cent. of the alkaloids. Powdered Opium is directed to be used in making

the various preparations of Opium as tincture, etc. ; but most druggists disregard this direction, and use moist opium instead. More uniform preparations may be prepared from the powdered Opium, but it is doubtful if they contain any more of the valuable constituents when thus prepared than when made from a good quality of moist Opium. For the method of assaying Opium, see the Pharmacopœia. The dose of Powdered Opium is from $\frac{1}{2}$ to 2 grains or more.

2434. Opium Denarcotisatum.

Denarcotised Opium.

This preparation of Opium was introduced in the 1880 U. S. P. to supply an Opium deprived of its objectionable principles. It has the same strength of Morphine as powdered Opium, but is deprived of its narcotine and odorous principles.

Macerate powdered Opium containing 14 per cent. of Morphine, with Ether, using first 5 parts of Ether to 1 part of Opium, and, after macerating 24 hours, pour off, then macerate with $2\frac{1}{2}$ parts of Ether twice successively, and pour off as before, then dry the residue by gentle heat, and add to the powder enough powdered Sugar of Milk to make up the original weight of Opium.

Uses.— This may be used in powder the same as Opium or for making deodorized Tincture of Opium, the same quantity as is directed of powdered Opium, and in the same manner as ordinary Tincture of Opium is made. Being already deodorized it does not require treatment with ether.

Alkaloids in Opium.

Opium has been the subject of exhaustive chemical research and a large variety of Alkaloids and salts are derived from it. Only a few are used to any extent in pharmacy and medicine, the remainder being interesting only as chemical curiosities. The following list shows the Alkaloids which exist in Opium, and some derived from them which have been prepared by

chemists. The important ones have been described among the Alkaloids.

ALKALOID.	COMPOSITION.	PROPERTIES.	Per cent. in 100 parts Opium.
Apomorphine.....	$C_{17}H_{17}NO_2$	Sedative, Emetic.	From Morphine.
Apocodeine.....	$C_{18}H_{19}NO_2$	Sedative.....	From Codeine.
Codeine.....	$C_{18}H_{21}NO_3$	Sedative.....	0.678.
Codamine.....	$C_{20}H_{25}NO_4$	Sedative.....	.....
Cotarine.....	$C_{12}H_{13}NO_3$	.....	From Narcotine.
Cryptopine.....	$C_{21}H_{23}NO_6$	Narcotic.....	.....
Deuteropine.....	$C_{20}H_{21}NO_5$	Narcotic.....	.....
Gnoscopine.....	$C_{84}H_{86}N_2O_{11}$	.....	.....
Hydrocotarine.....	$C_{12}H_{15}NO_3$	.....	.....
Lanthropine.....	$C_{23}H_{25}NO_4$	.....	.....
Laudanine.....	$C_{20}H_{25}NO_4$	.....	.....
Laudanosine.....	$C_{21}H_{27}NO_5$	.....	.....
Meconidine.....	$C_{21}H_{23}NO_4$	.....	0.804.
Morphine.....	$C_{17}H_{19}NO_3 \cdot H_2O$	Anodyne.....	10.842.
Narceine.....	$C_{23}H_{29}NO_9$	Narcotic.....	0.662.
Narcotine.....	$C_{22}H_{23}NO_7$	Narcotic.....	6.808.
Oxynarcotine.....	$C_{22}H_{23}NO_5$	Narcotic.....	From Narcotine.
Papaverine.....	$C_{21}H_{21}NO_4$	Narcotic.....	.....
Paramorphine.....	$C_{19}H_{21}NO_3$	Sedative.....	From Morphine.
Protopine.....	$C_{20}H_{19}NO_5$	.....	.....
Pseudomorphine.....	$C_{17}H_{19}NO_4$	Sedative.....	From Morphine.
Rheadine.....	$C_{21}H_{21}NO_6$	.....	.....
Thebaine.....	$C_{19}H_{21}NO_3$	.....	.....
Meconic Acid.....	$H_3C_7HO_7$	.....	5.154.
Meconin.....	$C_{10}H_{10}O_4$	.....	.....
Meconoisin.....	$C_8H_{10}O_2$	.....	.....

Besides the medicinal constituents of Opium mentioned, it contains in 100 parts: Resin, 3.582; gummy matter, 26.242; mucus, 19.086; fatty matter, 2.166; caoutchouc, 6.012; and water, 9.846.

OXYGENIUM — OXYGEN.

Symbol, O; Atomic weight 15.96.

Oxygen is a gaseous element, transparent, colorless, odorless, and tasteless, about 16 times the weight of hydrogen. In a free state it constitutes about one-fifth of the volume of the atmosphere. Combined with hydrogen it forms about eight-ninths of the weight of water, and in this combination and union with other elements it constitutes a large proportion of all animal and vegetable as well as mineral mat-

ter,—forming, it is estimated, fully one-half the solid crust of the earth.

It supports combustion, and unites with all the elements, except fluorine (with which it is not known to combine), forming *oxides*. With many of the elements it unites in more than one proportion, its combinations being then known as *monoxides*, *di*, *deut* or *binoxides*, *ter* or *trioxides*, *tetroxides* and *pentoxides*, as they combine with 1, 2, 3, 4 or 5 volumes of Oxygen.

Oxides which are reduced from hydrates by depriving them of the elements of water, without otherwise changing their composition, are frequently called *anhydrides*. In combination with hydrogen Oxygen unites with many positive bases, forming *hydrates* or *hydroxides*.

Oxygen is most readily obtained for experimental purposes by heating Chlorate of Potassium with about one-eighth its weight of manganese dioxide in a flask and collecting the gas.

The combinations of Oxygen with bases are noted under the basic substances with which it combines.

Oxidation is the operation by which Oxygen combines with other substances forming Oxides. The term *oxygenation* is sometimes used to describe the same process.

Ozone is an allotropic form of Oxygen, produced by the union of three atoms of Oxygen in one molecule, while the Oxygen molecule is composed of but two atoms. It is a colorless gas, having a peculiar unpleasant odor, and rapidly changing into normal Oxygen. It is a wonderful bleaching and deodorizing agent. It is produced by the action of electricity on Oxygen and by other methods, and was formerly called *electric air*.

2435. PANCREATINUM—PANCREATIN.

Pancreatin is a ferment, the agent by which fats are converted into emulsions before entering the circulation. It is obtained for medicinal use from the Pancreas of beef by chopping them fine, macerating with successive portions of water,

acidulated with Hydrochloric Acid (1 part to 30), straining the liquids, then filtering through coarse paper, neutralizing by adding Carbonate of Calcium, again filtering, adding to the filtrate an equal bulk of Alcohol, and after standing gathering the precipitate, washing, pressing between bibulous paper and drying. The product is a transparent, brittle, yellow mass, which might properly be called *Crystal Pancreatin*. This is used in pharmacy in making emulsions and elixirs, and in medicine to aid the assimilation of fats. The dose is 5 to 10 grains.

2436. Pancreatinum Saccharatum.

Saccharated Pancreatin.

Pancreatin, 1 part or 1 ounce.

Sugar of Milk, 9 parts or 9 ounces.

Powder them together. The dose is from 20 to 60 grains or more.

2437. PEPSINUM — PEPSIN.

Pepsin is a ferment, the agent by which a portion of the food which is taken into the stomach is dissolved and fitted for assimilation. It is obtained from the lining or mucous membrane of the stomachs of various animals, that from the stomach of the hog being preferred for most purposes. Prof. Scheffer's method is now quite generally employed. It is as follows: The fresh stomachs are deprived of their fat and divested of their outer coating, cut open, gently washed with cold water, and macerated for several days in a "pickle" composed of Water 30 parts, and Hydrochloric Acid 1 part, with frequent stirring. The liquid is then strained and filtered clear through coarse paper, or allowed to stand 24 hours, and then poured off. Common salt is then added and thoroughly mixed with the liquid. The Pepsin rises to the top, and after

standing is skimmed off and drained in a strainer, then submitted to strong pressure to force out all that is possible of the saline solution, and carefully dried in warm air without heat. This constitutes the Crude Pepsin which is used for making Purified Pepsin, Saccharated Pepsin, etc.

Purified Pepsin or Scale Pepsin.—This is prepared by redissolving the crude Pepsin, before drying, in water acidulated with Hydrochloric Acid, then adding just sufficient salt to separate it from its solution, washing it gently with cold water and draining, pressing, and drying rapidly on glass with gentle heat.

Crystal Pepsin.—A Pepsin bearing this brand is prepared by Dr. Carl L. Jensen, of Philadelphia. The process by which it is prepared is said to be by subjecting the stomachs to the action of heat and dilute acid, whereby a gastric digestion takes place and a *Peptone* containing their digestive ferments is produced. It is then purified and dried in the manner above described.

Many rival manufacturers of Pepsin under different names urge the superiority of their product, but the process as given (2437) is believed, if properly conducted, to produce the most reliable of any.

2438. Pepsinum Saccharatum.

Saccharated Pepsin.

Saccharated Pepsin is now official in the U. S. and may be prepared as follows:

Scale or Crude Pepsin, 1 part or 1 ounce.

Sugar of Milk, 9 parts or 9 ounces.

The value of this preparation must, of course, depend upon the scale or crude Pepsin which is employed. The pharmacopœia requires that 1 part of the finished product dissolved in 500 parts of water acidulated with 7.5 parts of Hydrochloric Acid shall digest at least 50 parts of hard-boiled egg albumen, in 5 or 6 hours, at a temperature of 38° to 40° C. (100° to 104° F.)

It is a fact that much of the Saccharated Pepsin of the market is nearly worthless.

2439. Pepsin Compound.

Compound Powder of Pepsin.

Scale or purified Pepsin,	10 parts.
Pancreatin, pure,	10 parts.
Diastase (Vegetable Ptyalin),	1 part.
Lactic Acid,	1 part.
Hydrochloric Acid,	3 parts.
Sugar of Milk,	75 parts.

Powder the Pepsin and Pancreatin by rubbing with the Sugar of Milk, add the Diastase, and, when they are all reduced to a fine powder and intimately mixed, add the Acids first to a small portion by rubbing them well together and then add the remainder and mix.

If Saccharated Pancreatin and Pepsin are used, 47½ parts of each should be used and the Sugar of Milk omitted.

Under the name "*Lactopeptine*" a preparation put up by the *New-York Pharmacal Association* has had an extensive sale. Its composition is similar to the foregoing.

2440. PEPTONES.

Peptones are formed by the action of Pepsin or Pepsin, Pancreatin, etc., on albuminous foods or substances. They are in fact partially digested foods, fitted for assimilation. Several manufacturers have introduced preparations containing Peptones, to aid disordered peptic digestion, etc. They are usually made by chopping lean beef very fine and macerating it for about 6 hours in a Solution of Pepsin with water and hydrochloric acid, at a temperature of about 104° F. The beef is thus mostly dissolved, the mixture is strained, and the solution may be combined with various medicines as may be required. Excess of Pepsin and Pancreatin are sometimes added, and the solution thus prepared is added to wine, elixirs, emulsions, etc. The liquid Peptone is also evaporated and furnished in the form of a scale salt, as *Beef Peptone*.

PETROLEUM.

This important hydrocarbon, which is obtained from the earth by drilling "oil wells," is the source of many valuable substances employed in pharmacy and medicine. As obtained from the earth it is called "Crude Oil," or "Crude Petroleum." By fractional distillation several light ethereal products are first obtained, then the illuminating oils, and after these the heavier products, among which are Petrolatum and Paraffin. Crude Petroleum is considerably used in liniments for rheumatism, swellings, etc.

The lighter products of the fractional distillation of Petroleum are

2441. Cymogene, Sp. gr. 0.590, which boils at 32° F., the freezing point of water, and is only obtained by condensing the vapors, which first pass over, by a specially constructed pump. It has no practical use.

2442. Rhigolene, Sp. gr. 0.625. Boils at 65° F., and is condensed by ice and salt from the first vapors that come over. It is used for freezing mixtures, and as a spray for local freezing in surgical operations. It must be handled with great caution.

2443. Gasoline, Petroleum Ether or Benzine.—Sp. gr. 0.665 to 0.675. Condensed in a worm by cold water. It is extensively used for vaporizing in gas machines and for burning in properly-constructed stoves, also for removing grease and as a solvent for fixed oils. This is the Official Benzine, see page 189.

2444. Naphtha.—Sp. gr. 0.695 to 0.705. This is a heavier form of Gasoline, used for burning and as a solvent for oils, etc. See page 189.

2445. Benzine.—Sp. gr. 0.725 to 0.737. This was formerly extensively used as a substitute for Turpentine, but is now little employed except as a solvent for gums, in making some kinds of varnishes and rubber. It is mostly worked in with the illuminating oils.

2446. Carbon Oil or Refined Petroleum.—Sp. gr. 0.800 to 0.815. This is the Illuminating Oil which varies considerably in sp. gr. etc., as made for different purposes and by different houses. The standard test at which Carbon Oil will flash or explode when heated, is regulated by legislation in different States from 120° F. to 150° F., New-York test being 138° F. *Signal Oil*, which is burned in lanterns and locomotive engines, is a still higher test oil usually mixed with Sperm Oil. After the illuminating Oils are obtained, lubricating Oils are separated, then the heavier products Petrolatum, Paraffin (370), Carbohc Acid, and other derivatives, which correspond to the products obtained from Coal Tar.

2447.

PETROLATUM.*Cosmoline, Vaseline, Petroleum Ointment, etc.*

This is official in the U. S. P., and is described as a semi-solid substance consisting of hydrocarbons chiefly of the marsh-gas series ($C_{16}H_{34}$, etc.), obtained by distilling off the lighter and more volatile portions from American Petroleum and purifying the residue. Its melting point is from 104° to 125° F. This substance is mostly prepared from the residuum which collects in storage tanks, oil wells, etc., which is familiarly known as "B. S. Oil." From this the lighter portions are distilled and the residue transferred to large percolators or cylinders, partly filled with freshly-prepared animal charcoal (bone black) and kept heated by proper appliances to a degree which will liquefy the oil. As it comes through the percolator it is deodorized and decolorized, the first portions being white when cold and the later runs being from a light amber to a dark color. It is then brought up to the proper melting point, which is usually 104° F., by adding paraffin and mixing them thoroughly.

Uses.—The value of this product as an ointment base has caused it to be almost universally adopted for that purpose in advance of official directions. It does not become rancid by age. It is claimed that it is not so readily absorbed as lard, and that some desired chemical changes in some ointments do not take place when this is used. These objections are noted under the proper formulas.

Paraffin, Paraffin Oil, Lubricating Oil, and other Petroleum products have been noticed elsewhere.

PHENYL.

Phenyl is the hypothetical radical of the Phenyl series of compounds, of which Phenol and Phenylamine are derivations.

2448. Phenol or Carbolic Acid— C_6H_5HO .—A product of the distillation of coal-tar between the temperatures of 180° and 190° C. (356° and 374° F.).

Carbolic Acid or Phenol is the hydrate of Phenyl, or Phenic Alcohol. Crude Carbolic Acid is a liquid distilled from coal-tar, containing many empyreumatic products. Pure Crystallized Carbolic Acid is made by distilling crude Carbolic Acid and purifying the crystallized product obtained by repeated distillations. (See 28.)

Cresylic Acid or *Cresol*, C_7H_8O , is a homologue of Carbolic Acid, very similar to it, but less soluble.

Phenol-phthalein is prepared from Phenol and Pthalic Anhydride. It is used in making a test solution.

2449. Phenylamine or Aniline, C_6H_5N , is the base of the Aniline salts so extensively used for dyeing. (See 179.) It is prepared by treating an alcoholic solution of Nitrobenzol with Ammonia and Hydrogen Sulphide until Sulphur is precipitated. The liquid portion is again treated with Hydrogen Sulphide until no more sulphur can be precipitated. The liquid is then mixed with an excess of acid, filtered, boiled, and distilled with an excess of Caustic Potassa.

PHOSPHORUS.

Symbol, P; Atomic weight, 31.

Phosphorus is a non-metallic element, existing in nature mainly in the form of salts, and obtained for use by decomposing its compounds. It is mostly prepared from Acid Calcium Phosphate by heating with charcoal and collecting the distillate under warm water, afterward filtering by squeezing through chamois leather under warm water, then moulding it in sticks, in which form it comes into the market.

Phosphorus assumes several allotropic forms under different treatment. In its normal condition, as above described, it is the ordinary Phosphorus of the market, pale-yellow, semi-transparent; soft and waxy when warmed to about $75^{\circ}F.$, melting at $111^{\circ}F.$, taking fire in the air at $165^{\circ}F.$, and slowly oxidizing in the air at all temperatures above $60^{\circ}F.$ It must be preserved under water.

Uses.—Phosphorus is extensively used in making matches, and in the form of pills and solutions is considerably employed in medicine as a nerve tonic and vitalizer. Its acids and salts are important pharmaceuticals extensively used both in medicine and pharmacy and in the industrial arts. The dose of Phosphorus is from $\frac{1}{100}$ to $\frac{1}{60}$ grains, in pills or solution.

Allotropic Forms of Phosphorus.

Phosphorus assumes under different treatment several allotropic forms, which, although different in physical characteristics, are the same chemically.

2450. Red or Amorphous Phosphorus is prepared by exposing ordinary phosphorous to an atmosphere of Carbonic Acid at 225° to $250^{\circ}\text{C}.$ for several days, when it is converted into a red, amorphous mass, having entirely different properties than ordinary phosphorous, being non-luminous, non-combustible at ordinary temperatures, and non-poisonous. When heated to $280^{\circ}\text{C}.$ it is reconverted into ordinary phosphorus.

White Phosphorus, *Black Phosphorus*, and *Liquid Phosphorus* are other allotropic forms obtained by various treatment but are not used in pharmacy.

Combinations of Phosphorus.

Phosphorus combines with the metallic bases forming *Phosphides*, the more important ones being noticed under the metals with which it combines. It also unites with the non-metals, forming compounds, the more important of which are here noticed.

2451. Chloride of Phosphorus— PCl_5 .—By the spontaneous combustion of Phosphorus in an excess of dry Chlorine, or by passing dry Chlorine into liquid Terchloride of Phosphorus, an *Oxychloride of Phosphorus*, PCl_3O , is made by heating Chloride of Phosphorus with a quantity of Water insufficient to convert it into Phosphoric Acid.

2452. Hydride of Phosphorus, PH_3 , or *Phosphoretted Hydrogen*, is an explosive gas made by boiling Phosphorus with Milk of Lime, as in making Hypophosphorus Acid. It has a very disagreeable smell.

2453. Oxides of Phosphorus.—With Oxygen, Phosphorus forms three Oxides, *Phosphoric Oxide*, P_2O_5 , Phosphorus Oxide, P_2O_3 , and Hypophosphorus Oxide, P_2O .

2454. Acids of Phosphorus.—The more important of these Acids have been already described. (34, 42, 43.)

Orthophosphoric Acid, H_3PO_4 (tribasic), is made by dissolving Phosphoric Oxide in water, or by the action of Nitric Acid on Phosphorus. The 50 per cent. solution is the U. S. official Phosphoric Acid. The salts made by combining this Acid with bases are called *Phosphates*.

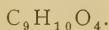
Pyrophosphoric Acid, $\text{H}_4\text{P}_2\text{O}_7$, by heating Orthophosphoric Acid to $213^{\circ}\text{C}.$ ($415.4^{\circ}\text{F}.$).

Metaphosphoric Acid by igniting tribasic Phosphoric Acid or by dissolving P_2O_5 in cold water. These three Acids correspond with the Oxides above mentioned.

Phosphorous Acid, H_3PO_3 , cannot be formed directly from Phosphorus Oxide but is a dibasic Acid, containing one hydrogen atom that cannot be replaced by a metal. The salts of this Acid are called *Phosphites*.

Hypophosphorus Acid, H_3PO_2 , cannot be made directly from Hypophosphorous Oxide. It contains two hydrogen atoms not replaceable by a metal. It is the acid basis of the *Hypophosphite* salts.

2455. PICROTOXINUM — PICROTOXIN.



A neutral principle prepared from the seeds of *Anamirta Paniculata* — the kernel of *Cocculus Indicus* — by exhausting with hot water, evaporating to an extract, mixing the extract with Magnesia, then treating with hot Alcohol, filtering through animal charcoal, concentrating by evaporation, and crystallizing.

Uses.—This is used as an antispasmodic and nerve tonic, like Strychnine, in doses of $\frac{1}{100}$ to $\frac{1}{60}$ grain.

PILULÆ — PILLS.

Since the general introduction of sugar and gelatine-coated pills, their manufacture has been almost entirely monopolized by manufacturing houses. The pill business has come to be a great nuisance to druggists, for the reason that so many manufacturers urge their claims for superiority upon the physicians, that a large stock of many different makes must be kept on hand in order to supply the demand.

It is not only unprofitable, but very annoying to be obliged to keep so many manufacturers' pills on hand, but as yet there seems to be no way of avoiding it.

The pills that are included in the Pharmacopœia constitute but a very small portion of those in use, and as manufacturers' pills are nearly always coated with sugar or gelatine, it may be said that scarcely any pills made by the Pharmacopœia formulæ are dispensed by druggists.

The making and coating of pills to any great extent is impracticable for the mass of druggists, because it requires considerable apparatus and some experience and skill; and further, because there are so few of any but the leading or special pills used that it does not pay to make the small quantity required for the retail trade. Many druggists, however, prefer to make their own pills as a matter of reliability. We give, therefore, the general processes for making and coating pills, and such formulæ as may seem expedient for those who wish to prepare their own pills.

The recent introduction of reliable powdered extracts of American manufacture, has very much simplified the making of pills, as the ingredients may be readily and accurately mixed before combining into a pill mass.

Many of the old solid extracts were very difficult to work evenly into a pill mass, and required much preparation before they were ready for use.

This is now happily done away with by the introduction of powdered extracts of all dangerous drugs, and by the use of which a thorough distribution of the medicinal agents may be secured.

Not only are the powdered extracts better on this account, but the mass can be much more readily prepared; as, with the old solid extracts it was often necessary to soften them, so that an extra amount of drier had afterwards to be used, which increased the bulk of the pill. Small pills are now the fashion in medicine, and a pill without some kind of coating is looked upon with great disgust by the great American stomach. Upon the nicety of the pill depends the nicety with which it can be coated, so we will first consider the pill itself, and afterwards its outer covering. This is the reverse of the view taken by the pill-taker, as he usually is more concerned as to the character of the covering than the character of the pill; but the *pill-maker* and the *pill-taker* can hardly be expected to take the same view of the subject.

The directions which follow are intended for the use of the ordinary druggists, with such conveniences as they all have, to make and coat pills in small quantities, suitable for the retail trade, and for extemporaneous and prescription business.

Conveniences for Pill Making.

Pill Machines are only adapted to making certain sizes of pills. For the manufacturer who is making large quantities of certain sizes they are a great assistance, but for the retail druggist but little use can be made of them. Those who have them can use them for such sizes as their material will properly make, but it is hardly advisable for those who do not have them to buy them, as there are so few pills for which they can be used.

Materials vary so much that it is almost impossible for the druggist to so regulate the mass as to get the desired amount of material in each pill, when working with a machine. Take, for instance, Calomel and Quinine, a two-grain pill of one would be much smaller than a two-grain pill of the other, but the pill machine would make them both of the same size.

They are very convenient for marking and dividing the pill, and those who have them can use them for that purpose, but a simple, inexpensive pill marker and divider is more serviceable. The ordinary pill tile will answer every purpose. This, with a pill roller, a pill rounder, and the ordinary mortars and pestles completes the necessary outfit for ordinary pill making, and experience does the rest.

The Excipients.

Many Excipients have been proposed for making pills, with which druggists are already familiar, as mucilage, syrup, glucose, honey, soap, glycerin, etc., and all of them have their uses, but nothing has been found so good for general purposes as the *Starch Plasma*, or, as we shall call it here, *Excipient*.

It is tenacious without being elastic, readily mixable, free from odor or objectionable taste, does not mould or spoil, keeps without change, keeps the pills soft and pliable, is inexpensive, and readily made as follows:

2456

Excipient.

Starch, in fine powder,	1 drachm.
Glycerin, by weight,	1 ounce.

Mix and heat, with constant stirring, to boiling (240° F.), or until it has assumed a uniform gelatinous mass. Too high a degree of heat must not be used, as it will burn the Starch on the bottom, and it must be constantly stirred to prevent this result. It can be made best on a sand-bath.

In making pills with this Excipient, use only a small quantity, well worked in with the pestle, and then if more is required it may be added.

The Driers.

The chief use of the Drier is to dust the tile and roller and the pills after they are made, to prevent sticking together.

It is also sometimes necessary to use it with the mass when the extracts used are too soft or when oils or other liquids enter into the composition.

A great many substances are used as Driers, as Powdered Liquorice Root, Lycopodium, Flour, Starch, etc., but the best dryer to meet all the requirements for which it is needed, is made thus :

2457.

Drier.

Starch, in very fine powder,	}	equal parts, mixed.
Elm Bark, in very fine powder,		

This will be found much better than powdered Liquorice, Lycopodium, or other substances usually used for this purpose.

Finely powdered Starch or Wheat Flour alone is better for white pills than the above Drier, as it does not color them. Dextrine also makes a good Drier for colored pills.

They are best applied as a dusting, with an ordinary salt sprinkler or pepper-box, such as are used on the dining table.

This completes the list of requisites for making pills, except, of course, the drugs that enter into their composition.

Making Pills.

The Mass should always be made in a mortar, proportionate to the amount required, and with a long-handled

pestle, not too large. It is best to observe the following order in making the mass, so as to secure the best results in the least time.

First.— Reduce all crystals or pulverizable masses to a *very fine* powder by rubbing in the mortar. Powerful drugs like Strychnine, Atropia, Morphia, etc., should be mixed with a small quantity of Sugar of Milk in powdering, so as to secure a thorough distribution of their particles. When the crystals or other drugs are thoroughly powdered, add any powdered extracts, resinoids, or other powdered drugs that may be directed, and mix thoroughly and intimately in the mortar.

Second.— Add any solid extracts, confections or other masses that may be directed, taking great care to have them in such condition that they can be readily worked up with the other ingredients. Most extracts can be softened by warming a little; some require a little Water or Alcohol. Mix these thoroughly with the powders in the mortar by working them in with the pestle.

When this is done, if it requires to be softened (which is generally the case), add enough of the Excipient to make into a pilular mass, or, if too soft, add enough of the Drier to harden it.

In using the Excipient but a small amount is necessary, but it must be well worked in.

Never add Alcohol, Water, or Syrup to a pill mass if it can be avoided.

If any oils are directed in the formula, they should be mixed in a mortar with the Excipient before it is added to the mass. They are thus emulsified and the oily particles broken up, so that a thorough distribution is effected. Do not add oils to the powders in the mortar, as a portion of the powder absorbs the oil and the distribution is much retarded. It is also much more difficult to work the mass than when the oils are first combined with the Excipient.

If too much Excipient has been used, Drier may be added to bring it to the requisite temper, but it is better to be careful and not add too much, as the Drier increases the bulk and size of the pill.

The Pill. Having now prepared the mass, the Pill is next in order.

First.— Weigh the mass carefully and then (if for more than 24 Pills) divide it into portions that will make as many Pills as the Pill machine, tile, or divider indicates — 12, 18 or 24 is the usual number. For instance, if 100 Pills are to be made, and the whole mass weighs 316 grains, each Pill will be 3.16 grains. If the Pill tile, divider or machine is marked for 18 Pills, $3.16 \times 18 = 56.88$, or 57 grains, should be the weight of each portion, and you will have as many portions as 18 is contained in 100, or $5\frac{1}{2}$ portions.

Second.— Dust the tile or machine with the drier, and roll each portion out to the length indicated for the number of Pills. Several portions may be rolled out together at the same time, side by side, if the mass is of proper consistence, and drier is properly used. They should be rolled evenly from end to end, with a slanting motion of the roller.

When rolled to the proper length, divide as indicated by the tile, divider or machine, and roll into Pills. Complete the rolling at last by rolling the rounded Pills gently with a circular motion of the roller on the slab. Put in a shallow tin, or other convenient dish, in a cool place to harden.

A jelly-cake tin is very convenient for this purpose. A scale pan may also be used. The Pills, thus prepared, are ready for coating.

Coating Pills.

Pills are coated chiefly to render them tasteless while being taken; but the coating serves the further important office of protecting them from the atmosphere.

Sugar Coating.— The apparatus for coating Pills advantageously with sugar is quite expensive, and the experience required to coat them artistically is considerable. They may, however, be coated in a small way by revolving the Pills after they are made in a little albumen or mucilage, to give them a thin coating, then transferring to another dish, dusting them well with finely powdered sugar, and rolling them in a shallow evaporating dish, thus giving them an even coating.

This method is only used for extemporaneous work. To coat Pills with sugar as they are found in the market requires large copper revolving globes, of which the upper third is cut off, and which are revolved at an angle (the same as are used by confectioners). The best apparatus of this sort is also arranged for an oscillating motion, which prevents the Pills from adhering to the side. They are also arranged with heating apparatus, so that the heat may be maintained at any desired degree.

The Pills are first partially dried, then coated over with Tincture of Tolu or a Solution of Shellac. Then put in the coating apparatus, add a little syrup of white sugar and a sprinkling of starch from time to time, while the globe is slowly revolved, a very moderate heat being applied at the same time, until the coating is of sufficient thickness. To give a finish or polish to the Pills after they are coated, they are agitated in the coater with a few lumps of paraffine or wax. It is obvious that small quantities of Pills cannot be conveniently sugar-coated in this manner.

It will thus be seen that sugar-coating Pills as they are found in the market requires expensive machinery, experience and time, which are not at the disposal of the ordinary druggist in his business.

Gelatine Coating.—Pills may be coated with Gelatine by sticking them on pins and dipping them in a Solution of Gelatine, etc., heated sufficiently to keep it liquid, then revolving them in the air until the coating is sufficiently set so that the Pills will not adhere when put together. The solution for Gelatine or Soluble Coating may be made as follows :

2458. Gelatine Coating.

Best White Gelatine, Cooper's, Cox's, or

French, 1 ounce av.

Water, 4 fl.ounces.

Dissolve the Gelatine in the water, by heat of water-bath, and strain through a tin strainer or a sieve into a water-bath, which must be kept warm, adding a trifle of warm water

occasionally to make up for the evaporation. Dip the Pills in the Solution quickly, and revolve in the air until dry.

2459. Gelacacia or Soluble Coating.

Gelatin, best white,	1 ounce av.
Gum Arabic, select,	$\frac{1}{2}$ ounce av.
Glycerin,	$\frac{1}{4}$ ounce av.
Water,	$4\frac{1}{2}$ ounces av.

Dissolve the Gum Arabic in 2 ounces of the Water by allowing to stand over night, add this to the Gelatin and balance of the Water and Glycerin and heat to dissolve the Gelatin. When dissolved strain and keep warm with a water-bath while using.

The pills, stuck on pins or needles, are to be dipped into the solution and dried by revolving in the air.

This makes the best and smoothest coating for pills. It may with propriety be called Gelatin Coating. Apparatus of various kinds may be obtained for Gelatin-Coating pill, but without experience it proves generally unsatisfactory in the hands of druggists.

Pills may also be coated with a solution of Shellac, 90 grains to 1 ounce of Alcohol, which does very well for extemporaneous work. They may be dipped in the solution or revolved in an evaporating dish with a very small quantity of it.

2460. Silvering and Gilding Pills.

Pills are sometimes coated with silver or gold leaf. This is done simply by moistening the pills with a thin coating of Albumen or Acacia solution and then revolving in a small globe in which leaves of silver or gold have been placed. The process is familiar to most druggists and many already have the small globes for silvering or gilding.

Besides the substances already mentioned for coating pills, French Chalk or Starch are sometimes used, the pills being first rolled in a solution of Acacia and then transferred to another dish containing the coating substance, which adheres sufficiently for the purpose. Paraffin and Cacao Butter are also used for coating pills.

Formulæ for Pills.

In the formulæ which follow it is not intended to give working formulas for definite quantities of Pills, but only the composition of those most used, with such hints as may be necessary for making them. The composition is mostly given for one Pill only, and it is obvious that any number may be calculated by multiplying the ingredients of the formula by the number of Pills desired.

2463. Abernethy's Pills.—Aloes Socotrine, Extract Hyoscyamus, each 2 grains, Pill Hydrarg., 1 grain, Ipecac $\frac{5}{8}$ grain.

2464. Aconitine Pills.—(Amorpus) are made $\frac{1}{100}$ and $\frac{1}{50}$ grain, each with Extract Gentian as an excipient.

2465. Aconitine Pills (Dequesnels Crystallized), are made $\frac{1}{500}$ to $\frac{1}{200}$ grain each, with Extract Gentian as an excipient.

2466. Aconite Extract Pills.—These may be made $\frac{1}{4}$, $\frac{1}{2}$ or 1 grain, or to contain $\frac{1}{8}$ to $\frac{1}{2}$ minim of Tincture of Aconite in each.

2467. Aloes Pills.—The U. S. formula is equal parts of purified Aloes and Soap, to make a 4-grain Pill. The Br. P. directs these to be made both from Barbadoes and Socotrine Aloes, containing about one-half Aloes, one-fourth each Soap and Confection of Roses, and $\frac{1}{8}$ part Oil of Caraway.

2468. Aloes and Asafetida Pills.—The U. S. P. directs purified Aloes, Asafetida and Soap, each $1\frac{1}{3}$ grains. The Br. P. directs the same proportions, with the addition of about the same quantity of Confection of Roses, the dose being 5 to 10 grains.

2469. Aloes and Iron Pills.—The U. S. P. directs purified Aloes, dried Sulphate of Iron and Aromatic Powder, each one grain, with sufficient Confection of Roses to make a mass. The Br.

formula is Sulphate of Iron $1\frac{1}{2}$ part, Barbadoes Aloes 2 parts, Compound Powder of Cinnamon 3 parts, Confection of Roses 4 parts, the dose being 5 to 10 grains. Some manufacturers add $\frac{1}{2}$ grain Extract Conium to each Pill.

2470. Aloes and Mastic—*Lady Webster's Dinner Pill.*—Purified Aloes 2 grains, Mastic, Red Rose, each $\frac{1}{2}$ grain in each Pill. This is a favorite Dinner Pill.

2471. Aloes and Myrrh Pills.—The U. S. formula is purified Aloes 2 grains, Myrrh 1 grain, Aromatic Powder $\frac{1}{2}$ grain, mixed with syrup, in each pill. The Br. is about the same.

2472. Aloes, Myrrh and Iron Pills.—Socotrine Aloes, Myrrh, each 2 grains, dried Sulphate of Iron 1 grain, in each pill.

2473. Aloes and Nux Vomica Pills.—Socotrine Aloes $1\frac{1}{2}$ grains, Extract Nux Vomica $\frac{1}{2}$ grain, in each pill.

2474. Aloes, Nux Vomica and Belladonna Pills.—Add $\frac{1}{8}$ grain Extract of Belladonna to the former formula.

2475. Aloin Pills.—These Pills are made $\frac{1}{10}$ grain, $\frac{1}{5}$ grain, $\frac{1}{2}$ or 1 grain of Aloin in each, with Extract of Gentian as an excipient.

2476. Aloin Compound Pills.—Aloin $\frac{1}{8}$ grain, Podophyllin $\frac{1}{8}$ grain, Extract Belladonna $\frac{1}{4}$ grain, in each

pill. Many other compounds are made with Aloin and Podophyllin.

2477. Aloin and Strychnine Pills.—Aloin $\frac{1}{2}$ grain, Strychnine $\frac{1}{80}$ grain, with Extract Gentian as an excipient.

2478. Aloin, Strychnine and Belladonna Pills.—Add $\frac{1}{8}$ grain Extract of Belladonna to each pill, made as the preceding.

2479. Alterative Pills.—Ipecac, Opium, each $\frac{1}{8}$ grain, Pill Hydrag. (Blue Mass), 1 grain in each pill.

2480. Anderson's (Scot's) Pills.—These are generally prepared in this country from Aloes 24 parts, Castile Soap 4 parts, Colocynth and Gamboge, each 1 part, Oil Anise $\frac{1}{2}$ part, made into 3 grain pills.

2481. Anti-bilious Pills.—Compound Extract of Colocynth $2\frac{1}{2}$ grains, Podophyllin $\frac{1}{4}$ grain in each. Many other similar formulas may be used.

2482. Anti-Constipation Pills.—Juglandin, Leptandrin, each $\frac{1}{4}$ grain, Extract Henbane $\frac{1}{8}$ grain, Strychnine $\frac{1}{100}$ grain, in each pill.

2483. Anti-Chill Pills.—Chinoidin 1 grain, Oleo-resin, Black Pepper, 1 grain, Ferrocyanide of Iron 2 grains, Arsenious Acid $\frac{1}{20}$ grain in each. Many other similar formulas may be used.

2484. Anti-Dyspeptic Pills.—Strychnine $\frac{1}{40}$ grain, Extract Belladonna, Ipecac, each $\frac{1}{10}$ grain, Blue Mass, Extract Colocynth Compound, each 2 grains in each pill.

2485. Anti-Periodic Pills.—Sulphate Cinchonidine 1 grain, Sulphate Iron $\frac{1}{2}$ grain, Podophyllin, Gelsemin, each $\frac{1}{20}$ grain, Strychnia $\frac{1}{32}$ grain, Oil Capsicum $\frac{1}{10}$ drop, in each pill.

2486. Anti-Malarial Pills.—Sulphate Quinine 1 grain, Sulphate Cinchonidine 1 grain, Arsenious Acid $\frac{1}{40}$ grain, Carboic Acid $\frac{1}{8}$ grain, Oil Pep-

permint $\frac{1}{8}$ grain, Capsicum $\frac{1}{4}$ grain, in each pill.

2487. Anthelmintic Pills.—Santonine, Calomel, each 1 grain in each pill, with confection Senna as an excipient.

2488. Aperient Pills.—Extract Colocynth Compound 2 grains, Extract Nux Vomica $\frac{1}{3}$ grain, Extract Hyoscyamus $\frac{1}{2}$ grain in each pill. Many other pills may be put up under this name.

2489. Aphrodisiac Pills.—Extract Damiana 2 grains, Extract Nux Vomica $\frac{1}{3}$ grain, Phosphorus $\frac{1}{100}$ grain, in each pill

2490. Arsenious Acid Pills.—These pills are made $\frac{1}{60}$, $\frac{1}{40}$, $\frac{1}{30}$, and $\frac{1}{20}$ grain, with Excipient or Extract Gentian in each pill.

Iodide of Arsenic and other salts of Arsenic are made generally about $\frac{1}{32}$ grain in each pill.

2491. Asafetida Pills.—Asafetida, in powder $1\frac{1}{2}$ grain, Castile Soap $\frac{1}{2}$ grain in each, well rubbed together to form a mass. This makes a 2-grain pill. Double the quantities for 4-grain pill. Asafetida Pills should be well coated with Tolu or Shellac.

2492. Asafetida Pills Compound, or Compound Galbanum Pills.—The Br. P. directs Asafetida, Galbanum, Myrrh, each 2 parts, Treacle 1 part to make a mass, of which 5 to 10 grains is a dose.

2493. Asafetida and Iron Pills.—Asafetida 2 grains, dried Sulphate of Iron 1 grain, in each pill.

2494. Asafetida and Nux Vomica Pills.—Asafetida 3 grains, Extract Nux Vomica $\frac{1}{4}$ grain, in each pill.

2495. Atropine Pills.—These are made to contain $\frac{1}{320}$, $\frac{1}{100}$, or $\frac{1}{60}$ grain of Atropine with Excipient or Extract Gentian in each.

2496. Belladonna Extract Pills.—Pills of Extract of Belladonna are

made $\frac{1}{10}$, $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{2}$ grain, in each pill.

2497. Bismuth Subnitrate Pills. These pills are made 3 or 5 grains, with excipient, in each pill. Subcarbonate of Bismuth is also made into pills the same quantity.

2498. Bismuth and Nux Vomica Pills.—Bismuth $2\frac{1}{2}$ grains, Extract Nux Vomica $\frac{1}{4}$ grain, in each pill.

2499. Bromide of Ammonium, Bromide of Potassium, and Bromide of Sodium Pills are made 5 grains in each pill, but they are much more desirable in the form of elixirs or solutions.

2500. Blue Pill or Pill Hydrarg.—This mass is made up into pills $\frac{1}{2}$ grain, 1 grain, 3 grains, and 5 grains each.

2501. Blue Pill Compound.—Blue Mass 1 grain, Opium $\frac{1}{2}$ grain, Ipecac $\frac{1}{4}$ grain, in each pill.

2502. Caffeine Citrate Pills.—Citrate of Caffeine 1 grain, with excipient in each Pill.

2503. Calcium Sulphide Pills.—These Pills are made to mask the disagreeable odor of this salt. $\frac{1}{10}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2 and 3 grains, each with excipient.

2504. Calomel Pills.—Pills of Calomel are made $\frac{1}{10}$, $\frac{1}{2}$, 1, 2, 3 and 5 grains, each with excipient.

2505. Calomel Compound Pills.—*Compound Pills of Antimony, Plummer's Pills.*—The U. S. formula is Sulphurated Antimony, Calomel each $\frac{1}{2}$ grain, Resin Guaiac 1 grain, in each pill. The Br. Pill contains Castor Oil also.

2506. Calomel, Nux Vomica and Podophyllin Pills.—Calomel 1 grain, Extract Nux Vomica $\frac{1}{2}$ grain, Podophyllin $\frac{1}{2}$ grain, in each pill.

2507. Calomel and Opium Pills.—Calomel 2 grains, Opium 1 grain, in each pill.

2508. Calomel and Rhubarb Pills.—Calomel $\frac{1}{2}$ grain, Extract Rhubarb, Compound Extract Colocynth, each $\frac{1}{2}$ grain, Extract Hyoscyamus $\frac{1}{6}$ grain, in each pill.

2509. Camphor Compound Pills.—Camphor, Opium, Kino, each 1 grain, Capsicum $\frac{1}{16}$ grain, in each pill.

2510. Camphor Hyoscyamus Pills.—Camphor, Extract Henbane, each 1 grain, in each pill.

2511. Camphor, Hyoscyamus and Valerian Pills.—Camphor, Henbane Extract, each 1 grain, Extract Valerian $\frac{1}{2}$ grain, in each pill.

2512. Camphor Monobromated Pills.—These Pills are made with 2 grains, 3 grains or 5 grains of monobromated Camphor, in each Pill.

2513. Camphor and Opium Pills.—Camphor 2 grains, Opium 1 grain, in each pill.

2514. Camphor, Opium and Tannin Pills.—Camphor $1\frac{1}{4}$ grains, Opium, Tannin, each $\frac{3}{8}$ grains, in each pill.

2515. Cannabis Indica Extract Pills.—These are made $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain of the Extract in each pill.

2516. Capsicum Pills.—Capsicum 1 grain, with Extract Gentian as an excipient in each pill.

2517. Cascara Sagrada Extract.—Cascara Sagrada Extract 2 grains, in each pill.

2518. Cathartic Compound Pills.—The U. S. formulæ is Compound Extract of Colocynth 130 grains, Abstract of Jalap 100 grains, Mild Chloride of Mercury 100 grains, Gamboge 25 grains, to make 100 pills.

2519. Cathartic Compound Pills.—*Active.*—Calomel, Powdered Extract Colocynth Compound, Gamboge, Castile Soap, each $\frac{1}{3}$ grain, Ipecac, $\frac{1}{2}$ grain, Socotrine Aloes $\frac{1}{2}$ grain, Rhubarb $\frac{1}{4}$

grain, Capsicum, Podophyllin each $\frac{1}{10}$ grain, in each pill.

2520. Cathartic Compound Pills.

—*Mild*.—Calomel $\frac{1}{4}$ grain, Colocynth Compound $\frac{1}{4}$ grain, Ipecac $\frac{1}{6}$ grain, Gamboge, Socotrine Aloes, Rhubarb, Capsicum, Castile Soap, each $\frac{1}{3}$ grain, Podophyllin $\frac{1}{25}$ grain, in each pill.

2521. Cathartic Compound Improved Pills.—Extract Colocynth Compound 1 grain, Extract Jalap $\frac{1}{4}$ grain, Resin Podophyllin $\frac{1}{8}$ grain, Resin Leptandrin $\frac{3}{8}$ grains, Extract Hyoscyamus $\frac{1}{4}$ grain, Extract Gentian $\frac{1}{2}$ grain, Oil Peppermint $\frac{1}{40}$ minim, in each pill.

Several other similar formulas are in use.

2522. Cathartic Vegetable Pills.

—*3 Grains*.—Compound Extract Colocynth 1 $\frac{1}{2}$ grains, Podophyllin $\frac{1}{3}$ grain, Leptandrin $\frac{1}{8}$ grain, Extract Jalap $\frac{1}{4}$ grain, Socotrine Aloes $\frac{1}{2}$ grain, Extract Hyoscyamus $\frac{1}{4}$ grain, Oil Peppermint $\frac{1}{10}$ minim, in each pill.

2523. Cerium Oxalate Pills.

These are made 1, 2 or 3 grains, with Excipient or Extract of Gentian in each pill.

2524. Charcoal Pills.—Willow Charcoal 3 grains in each.

2525. Chinoidin Pills.—These are made $\frac{1}{2}$, 1, 2, 3 or 5 grains of purified Chinoidin in each.

2526. Chinoidin Compound Pills.

—Chinoidin 2 grains, Iron 1 grain, Piperin $\frac{1}{2}$ grain, in each pill.

2527. Cinchona Bark Alkaloids Pills.—Sulphate of Quinine, Sulphate of Quinidine, Sulphate of Cinchonine, Sulphate of Cinchonidine, each $\frac{1}{2}$ grain, in each pill made in a mass with excipient.

2528. Cinchonine Sulphate Pills.

—These are made 1 $\frac{1}{2}$, 2, 3 and 5 grains in each, with excipient.

2529. Cinchonidine Sulphate Pills.—These are made 1, 2, 3, 4 and 5 grains in each pill, with excipient.

2530. Coca Extract Pills.—These are made 1, 2, or 3 grains of the Extract in each pill.

2531. Cocaine Pills.—These are made of the alkaloid and also of the hydrochlorate, $\frac{1}{4}$, $\frac{1}{2}$, and 1 grain in each pill.

2532. Codeine Pills.—These are made $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{2}$ grain of the alkaloid with Extract of Gentian as an excipient in each pill.

2533. Colocynth Compound Extract Pills.—These are made 3 grains of the extract in each pill.

2534. Colocynth Compound Pills.

—The Br. P. directs Colocynth Pulp 4 parts, Barbadoes Aloes 8 parts, Resin of Scammony 8 parts, Sulphate of Potassium 1 part, Oil of Cloves 1 part, to be mixed and beat into a mass, of which 5 to 10 grains is the dose. Manufacturers furnish 4 and 5 grain pills of this composition.

2535. Colocynth Compound and Blue Mass Pills.—Extract Colocynth Compound 3 grains, Blue Mass 2 grains, in each pill.

2536. Colocynth, Ipecac and Blue Pills.—Blue Mass, Extract Colocynth Compound, each 2 grains, Ipecac $\frac{1}{6}$ grain, in each pill.

2537. Colocynth and Hyoscyamus Pill.—The Br. P. directs Colocynth Compound Pill 2 parts, Extract of Hyoscyamus 1 part, to be made into a mass, of which the dose is 5 to 10 grains.

2538. Colocynth and Podophyllin Pill.—Compound Extract of Colocynth 2 $\frac{1}{2}$ grains, Resin of Podophyllin $\frac{1}{4}$ grain, in each pill.

2539. Colocynth, Hyoscyamus, and Blue Mass Pills.—Compound Extract of Colocynth 3 grains, Extract

Hyoscyamus, Blue Mass, each 1 grain in each pill.

2540. Colocynth, Nux Vomica, and Belladonna Pills.—Compound Extract of Colocynth 2 grains, Extract Nux Vomica $\frac{1}{2}$ grain, Extract Belladonna $\frac{1}{10}$ grain, in each pill.

2541. Conium Extract Pills.—Extract of Conium $\frac{1}{2}$ grain, 1 or 2 grains, in each pill.

2542. Conium Compound Pills.—The Br. P. directs Conium Extract 5 parts, Ipecac 1 part, to be made into a mass with Treacle, of which the dose is 5 to 10 grains.

2543. Cook's Pills.—Rhubarb, Aloes, each 1 grain, Calomel $\frac{3}{4}$ grain, Soap $\frac{1}{4}$ grain, in each pill.

2544. Copaiba Pills.—Solidified Copaiba is made up into pills of 3 grains each.

2545. Copaiba and Cubebs Pills.—Solidified Copaiba 2 parts and Oleo-resin Cubebs 1 part is made up into pills of 3 to 5 grains each. It is necessary to use some drier, as Magnesia, in making this pill.

2546. Copaiba Compound Pills.—Pill Copaiba, Resin Guaiac, each $1\frac{1}{2}$ grain, Citrate Iron, Oleo-resin Cubebs, each $\frac{1}{2}$ grain, in each pill.

2547. Corrosive Sublimate Pills.—These may be made $\frac{1}{100}$, $\frac{1}{40}$, $\frac{1}{20}$, $\frac{1}{10}$, or $\frac{1}{8}$ grain of the salts, with Extract Gentian, in each pill.

2548. Croton Oil Pills.—Croton Oil $\frac{1}{2}$ grain, Wheat Flour $1\frac{1}{2}$ grain in each pill, with excipient or some extract.

2549. Cubebs and Alum Pills.—Extract Cubebs 2 grains, Alum 1 grain, in each pill.

2550. Cubebs, Rhatany, and Iron Pills.—Extract Cubebs $1\frac{1}{2}$ grains, Extract Rhatany $\frac{1}{2}$ grain, Sulphate of Iron, 1 grain, in each pill.

2551. Damiana Extract Pills.—These are made 3 to 5 grains of the extract in each pill.

2552. Damiana and Phosphorus Compound Pills.—Extract Damiana 2 grains, Extract Nux Vomica $\frac{1}{8}$ grain, Phosphorus $\frac{1}{100}$ grain, in each pill.

2553. Digitalin Pills.—Digitalin $\frac{1}{60}$ grain in each pill with Extract of Gentian as excipient.

2554. Digitalis Extract Pills.—Digitalis Extract $\frac{1}{2}$ grain in each pill.

2555. Digitalis Compound Pills.—Digitalis, Squills, each 1 grain, Nitrate Potassium 2 grains, in each pill.

2556. Dinner Pills (Chapman's).—Aloes, Mastic, each $1\frac{1}{2}$ grain, Ipecac 1 grain, Oil Fennel $\frac{1}{40}$ grain, in each pill.

2557. Dinner Pills (Cole's).—Blue Pill, Aloes, Jalap, each $1\frac{1}{2}$ grains, Tartar Emetic $\frac{1}{60}$ grain, in each pill.

2558. Dinner Pill (Dr. Hall's).—*Aloes Pill Dilute.*—Aloes, Liquorice, Soap, and Theriaca, each 1 grain in each pill.

2559. Dinner Pill (Lady Webster's).—Aloes 2 grains, Mastic $\frac{1}{2}$ grain, Rose Leaves $\frac{1}{2}$ grain, beat together, in each pill.

2560. Diuretic Pills.—Extract of Buchu, Nitrate of Potassium, each 1 grain, Squill $\frac{1}{2}$ grain, in each pill.

2561. Elaterium Pills (Clutterbuck's).—These are made $\frac{1}{80}$ to $\frac{1}{10}$ grain each of Elaterium with Extract Gentian as an excipient.

2562. Elaterin Pills.—These are prepared $\frac{1}{100}$ to $\frac{1}{20}$ grain of the neutral principle Elaterin in each pill with Extract Gentian as an excipient.

2563. Emmenagogue Pills.—Ergotin, Extract Cotton Root, Aloes, Iron, each 1 grain, Oil Savin $\frac{1}{4}$ grain, in each pill.

2564. Ergotin Pills.—These are made with Ergotin 1, 2, or 3 grains in

each pill. One grain of Ergotin equals 10 grains of Ergot.

2565. Ergotin Compound Pills (Dr. C. Godson's).—Ergotin 3 grains, Extract Cannabis Indica $\frac{1}{6}$ grain, Strychnine $\frac{1}{80}$ grain, in each pill.

2566. Eucalyptus Extract Pills.—These are made 2 to 4 grains in each pill.

2567. Extract Pills.—Any extract can be made up into pills as desired, the quantity in the pill being regulated according to the medium dose usually given of the extract.

2568. Ferruginous Pills (Blaud's Pills).—Sulphate of Iron, dried, Carbonate of Potassium, each in equal quantities, made into a mass with powdered Tragacanth, $1\frac{1}{2}$ or $2\frac{1}{2}$ grains each of the Iron and Potassium, in each pill.

2569. Gelsemium Extract Pills.—These are made 1 grain each of Gelsemium Extract.

Gelsemin Pills are made $\frac{1}{8}$ grain with Extract Gentian excipient.

2570. Gentian Extract Compound Pills.—Extract Gentian, Aloes, each $\frac{2}{3}$ grain, Rhubarb $1\frac{1}{3}$ grain, in each pill.

2571. Gonorrhœa Pills.—Cubebs 2 grains, Pill Copaiba 1 grain, Sulphate Iron Exsic. $\frac{1}{2}$ grain, Venice Turpentine $1\frac{1}{2}$ grain, in each pill.

2572. Grindelia Robusta Extract Pills.—These are made 3 grains Extract Grindelia, in each pill.

2573. Guarana Extract Pills.—Extract of Guarana or Paullinia 1 or 3 grains in each pill.

2574. Helonias Compound Pill.—Helonias $\frac{1}{8}$ grain, Caullophyllin $\frac{1}{4}$ grain, Vibernin $\frac{1}{8}$ grain, Extract Mitchella $1\frac{1}{2}$ grain, in each pill.

2575. Hepatic Pills.—Blue Pill 3 grains, Extract Colocynth Compound 2 grains, Extract Belladonna $\frac{1}{4}$ grain.

2576. Hooper's Pills.—Barbadoes Aloes 1 grain, Sulphate Iron Exsic. $\frac{1}{3}$ grain, Extract Hellebore, Gum Myrrh, Castile Soap, each $\frac{1}{4}$ grain, Jamaica Ginger $\frac{1}{8}$ grain, Canella Alba $\frac{1}{8}$ grain in each pill.

2577. Hydrastine Pills.—These are made $\frac{1}{2}$ or 1 grain each of the white Alkaloid.

2578. Hyoscyamus Extract Pills.—Extract of Hyoscyamus $\frac{1}{2}$ or 1 grain in each pill.

Hyoscyamine (resinoid) Pills are made $\frac{1}{4}$ grain in each pill.

Hyoscyamine (alkaloid) Pills are made $\frac{1}{200}$ and $\frac{1}{100}$ grain and $\frac{1}{80}$ grain in each pill.

2579. Hypophosphites Compound Pills.—Hypophosphite of Lime 1 grain, Hypophosphite of Soda $\frac{3}{4}$ grain, Hypophosphite of Potassium $\frac{1}{2}$ grain, Hypophosphite of Iron $\frac{1}{4}$ grain, Extract Gentian $\frac{1}{2}$ grain, in each pill.

2580. Iodoform Pills.—Iodoform 1 grain with Extract of Gentian $\frac{1}{2}$ grain as an excipient in each pill.

2581. Iodoform and Iron Pills.—Iodoform, Iron by Hydrogen each 1 grain with Extract of Gentian as an excipient in each pill.

2582. Iodoform, Iron and Quinine Pills.—Iodoform 1 grain, Protocarb. Iron 2 grains, Quinine Sulph. $\frac{1}{2}$ grain in each pill. Other combinations of Iodoform are made with Opium, Nux Vomica, etc.

2583. Ipecac Pills.—Ipecac $\frac{1}{4}$, $\frac{1}{2}$ or 1 grain in each pill with excipient.

2584. Ipecac and Opium Pills, Dover's Pills.—Dover's Powder 1 grain, $2\frac{1}{2}$ grains and 5 grains each in each pill.

A Pill of Ipecac and Opium in which 2 grains represent the active ingredients of 5 grains of Dover's Powder may be made with Opium and Ipecac, each $\frac{1}{2}$ grain, Sulphate of Potassium 1 grain, in each pill.

2585. Ipecac and Hyoscyamus Pills.— Ipecac, Extract Hyoscyamus, each 1 grain, in each pill.

2586. Ipecac and Squill Pills.— Dover's Powder 3 grains, Squill, Ammoniac, each 1 grain, with Theriaca as an excipient. This is official in the Br. P.

2587. Irisin Compound Pills.— Irisin $\frac{1}{4}$ grain, Podophyllin $\frac{1}{10}$ grain, Strychnine $\frac{1}{40}$ grain, in each pill.

2588. Iron by Hydrogen Pills (*Quevenne's Pills*).— These are made 1 grain, 2 grains or 4 grains of Iron by Hydrogen in each pill, with Ext. Gentian as excipient.

2589. Iron Bromide Pills.— Bromide of Iron 3 grains, with Extract Gentian as excipient in each pill.

2590. Iron Citrate Pills.— These are made 2 or 3 grains of Citrate of Iron (not Citrate of Iron and Ammonium) in each pill.

2591. Iron Citrate and Cinchonidine Pills.— Citrate of Iron $1\frac{1}{2}$ grain, Cinchonidine Sulph. $\frac{1}{2}$ grain, in each pill. These pills are also made 3, 4 or 5 grains in the same proportion.

2592. Iron Citrate and Quinine Pills.— These are made 1, 2, 3, 4 and 5 grains of Citrate of Iron and Quinine in each pill.

2593. Iron Citrate and Strychnine Pills.— Citrate of Iron 1 grain, Strychnine $\frac{1}{80}$ grain, in each pill.

2594. Iron Citrate, Quinine and Strychnine Pills.— Citrate of Iron and Quinine 1 grain, Strychnine $\frac{1}{80}$ grain, in each pill.

2595. Iron Ferrocyanide Pills.— Ferrocyanide of Iron 3 grains with Ext. of Gentian as excipient in each pill.

2596. Iron Iodide Pills.— *Blanchard's Pills*.— These are made 1 grain of Iodide of Iron in each pill, with Extract Gentian as excipient.

2597. Iron Lactate Pills.— Lactate of Iron 1 grain in each pill, with Extract Gentian as excipient.

2598. Iron Phosphate Pills.— Phosphate of Iron 1, 2, 3 or 5 grains, in each pill.

Many Compounds of Phosphate of Iron with other salts and substances are made in the same proportion as combinations of Citrate of Iron.

2599. Iron Proto-Carbonate Pills.— *Vallet's Pills*.— These are made of Vallet's Mass, 2, 3 or 5 grains. The Br. Official Formula for Pill of Carbonate of Iron is Saccharated Carbonate of Iron 4 parts, Confection of Roses 1 part.

2600. Iron Sulphate Exsiccated Pills.— These are made from dried Sulphate of Iron 4 grains, with Extract of Gentian as excipient, in each pill.

2601. Iron Valerianate Pills.— Valerianate of Iron 1 grain in each pill, with Extract Gentian as excipient.

2602. Jaborandi Extract Pills.— These are made 3 grains of Extract of Jaborandi in each pill.

2603. Jalap Extract Pills.— Extract of Jalap 1 grain in each pill.

2604. Laxative Pills.— Rhubarb 1 grain, Castile Soap $\frac{3}{4}$ grain, Socotrine Aloes, $\frac{1}{2}$ grain, Myrrh $\frac{1}{3}$ grain, Ipecac $\frac{1}{8}$ grain, Bircarb. Soda $\frac{1}{2}$ grain, Oil Anise $\frac{1}{8}$ minim, in each pill.

2605. Leptandrin Pills.— These are made $\frac{1}{2}$, 1 or 2 grains of Resin Leptandrin in each pill.

2606. Leptandrin Compound Pills.— Leptandrin 1 grain, Irisin $\frac{1}{4}$ grain, Podophyllin $\frac{1}{3}$ grain, in each pill.

2607. Lupulin Pills.— These are made 3 grains of Lupulin in each pill.

2608. Lupulin and Camphor Pills.— Lupulin 1 grain, Camphor $1\frac{1}{2}$ grains, in each pill.

2609. Lupulin and Lettuce Pills.—Lupulin 1 grain, Extract of Lettuce 2 grains, in each pill.

2610. Mandrake Extract Pills.—These are made 1 grain of Extract of Mandrake in each pill.

2611. Mercurial or Blue Pill.—*Br. Blue Mass*—is made with Mercury 2 parts, Confection of Roses 3 parts, Liquorice Root 1 part. Rub the Mercury with the Confection of Roses until Globules of Mercury are no longer visible, then add the Liquorice and mix the whole well together.

2612. Mercury Bin-Iodide Pills.—These are made with Red Iodide of Mercury $\frac{1}{40}$, $\frac{1}{25}$ or $\frac{1}{16}$ grain in each pill, with Extract Gentian as an excipient.

2613. Mercury Cyanide Pills.—Cyanide of Mercury $\frac{1}{20}$ grain in each pill.

2614. Mercury Proto-Iodide Pills.—These are made $\frac{1}{8}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ grain of Green Iodide of Mercury in each pill.

2615. Mercury with Chalk Pills.—These are made $\frac{1}{2}$ and 1 grain of Hydrarg. cum Creta, in each pill.

2616. Morphine Pills are made of the Acetate, Muriate, Sulphate, and Valerianate of Morphine $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{6}$, and $\frac{1}{4}$ grain each, the $\frac{1}{8}$ grain being the size more frequently used.

Morphine is also combined with many other salts in the form of pills.

2617. Morphine Compound Pills. (*Dr. Hubbard's*).—These are made with $\frac{1}{8}$, $\frac{1}{6}$, or $\frac{1}{4}$ grain of Morphine Sulphate combined with 2 grains of Extract of Hyoscyamus and 1 grain of Camphor, in each pill.

2618. Neuralgia Pills (*Brown-Sequard*).—Extract Belladonna $\frac{1}{6}$ grain, Extract Stramonium $\frac{1}{8}$ grain, Extract Cannabis Indica $\frac{1}{4}$ grain, Extract Aconite $\frac{1}{3}$ grain, Extract Opium $\frac{1}{2}$

grain, Extract Conium 1 grain, Extract Hyoscyamus $\frac{2}{3}$ grain, in each pill.

With Extract Ignatia add $\frac{1}{2}$ grain Extract Ignatia in each pill.

2619. Neuralgia Pills (*Dr. Gross*).—Sulphate of Quinine 2 grains, Sulphate of Morphine $\frac{1}{20}$ grain, Powdered Extract Aconite $\frac{1}{2}$ grain, Strychnine $\frac{1}{32}$ grain, Arsenious Acid $\frac{1}{20}$ grain, in each pill.

Without Morphine, omit the Morphine from above formula.

2620. Nux Vomica Extract Pills.—These are made $\frac{1}{4}$ and $\frac{1}{2}$ grain of the extract in each pill.

2621. Opium Pills.—Opium is made up into pills of 1 grain each, with Soap as an excipient.

2622. Opium Extract Pills.—Aqueous Extract of Opium is made into $\frac{1}{4}$, $\frac{1}{2}$, and 1 grain pills.

2623. Opium and Acetate of Lead Pills.—These pills are made with 1 grain each Opium and Acetate of Lead in each pill, also with $\frac{1}{2}$ grain Opium, $1\frac{1}{2}$ grain Acetate of Lead, or with Acetate of Lead 6 parts, Opium 1 part, Confection of Roses 1 part, to make a 5 grain pill, the latter being the Br. P. formula.

2624. Ox Gall Pills.—Purified Ox Gall 2 grains, Ginger 1 grain.

2625. Phosphate Iron, Quinine, and Strychnine Pills.—Phosphate of Iron 2 grains, Quinine 1 grain, Strychnine $\frac{1}{80}$ grain.

2626. Phosphorus Pills.—The U. S. P. directs Phosphorous Pills to be made by dissolving 1 grain of Phosphorus in a test tube with 50 grains of purified Chloroform, then mix Althæa 80 grains with Acacia 20 grains in a mortar, add the dissolved Phosphorus, mix, then add Glycerin 40 grains, Water 20 grains, to make a mass which is to be divided into 100 pills. These are then to be well coated over with a solution of

Tolu in stronger Ether. Each pill contains $\frac{1}{100}$ grain Phosphorus.

The Br. P. directs 3 grains of Phosphorus and 120 grains of Balsam of Tolu to be put into a small mortar about half full of hot water, and when the Phosphorus has melted and the Balsam become sufficiently soft they are to be well rubbed together until no particles of Phosphorus are visible, the temperature of the water being maintained to about 60° C., 140° F. Yellow Wax 57 grains is then added and mixed with the mass under water, and the whole then allowed to cool and be kept under water.

When dispensed, 2 grains of this product is to be rubbed with one grain of Soap, a few drops of Alcohol being used if necessary to soften the whole. Three grains of the mass represents $\frac{1}{30}$ grain Phosphorus.

Washed Tolu is also used as a means of dividing Phosphorus, and an excipient is made with Phosphorus 24 grains, White Wax 60 grains, Venice Turpentine 156 grains, which contains ten per cent. of Phosphorus and is very convenient for making pills.

Phosphorus Pills are made $\frac{1}{100}$, $\frac{1}{80}$, $\frac{1}{60}$, $\frac{1}{50}$, $\frac{1}{40}$, $\frac{1}{30}$ grain each of Phosphorus, with Soap, Wax, or other excipient, and should be well coated with a varnish of Tolu or Shellac.

2627. Phosphorus Compound Pills.—Phosphorus $\frac{1}{100}$ grain, Extract Nux Vomica $\frac{1}{4}$ grain.

These are also made Phosphorus $\frac{1}{80}$ grain, Extract Nux Vomica $\frac{1}{4}$ grain, or Phosphorus $\frac{1}{60}$ grain, Extract Nux Vomica $\frac{1}{8}$ grain, in each pill.

2628. Phosphorus Compound and Iron Pills.—Phosphate of Iron $\frac{1}{2}$ grain, Phosphorus $\frac{1}{100}$ grain, Extract Nux Vomica $\frac{1}{8}$ grain, in each pill.

2629. Phosphorus and Extract Aconite Pills.—Phosphorus $\frac{1}{60}$ grain, Extract Aconite $\frac{1}{10}$ grain, in each pill.

2630. Phosphorus and Cannabis Indica Pills.—Phosphorus $\frac{1}{60}$ grain, Extract Cannabis Indica $\frac{1}{4}$ grain, in each pill.

2631. Phosphorus, Digitalis, and Hoscyanus Pills.—Phosphorus $\frac{1}{60}$ grain, Extract Digitalis, Extract Hyoscyamus, each 1 grain, in each pill.

2632. Phosphorus and Iron Pills.—Phosphorus $\frac{1}{60}$ grain, Iron by Hydrogen 2 grains, in each pill.

2633. Phosphorus, Iron, and Aloes Pills.—Phosphorus $\frac{1}{60}$ grain, Sulphate Iron Exsic. $1\frac{1}{2}$ grain, Aloes 1 grain, in each pill.

2634. Phosphorus and Quinine Pills.—Phosphorus $\frac{1}{60}$ grain, Sulphate Quinine 1 grain, in each pill.

2635. Phosphorus, Iron, and Quinine Pills.—Phosphorus $\frac{1}{100}$ grain, Sulphate Quinine 1 grain, Vallet's Mass 1 grain, in each pill.

2636. Phosphorus, Iron, Quinine, and Nux Vomica Pills.—Phosphorus $\frac{1}{60}$ grain, Extract Nux Vomica $\frac{1}{2}$ grain, Vallet's Mass, Quinine Sulphate, each 1 grain, in each pill.

2637. Phosphorus, Iron, Quinine, and Strychnine Pills.—Phosphorus $\frac{1}{100}$ grain, Iron by Hydrogen, Sulphate of Quinine, each 1 grain, Strychnine $\frac{1}{60}$ grain, in each pill.

2638. Podophyllin Pills.—These are made $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain of Podophyllin Resinoid in each pill with Extract of Mandrake or Gentian as an excipient.

2639. Podophyllin Compound Pills.—Podophyllin $\frac{1}{2}$ grain, Extract Hyoscyamus $\frac{1}{8}$ grain, Extract Nux Vomica $\frac{1}{10}$ grain, in each pill.

2640. Podophyllin and Blue Pills.—Podophyllin $\frac{1}{2}$ grain, Blue Mass $2\frac{1}{2}$ grains, in each pill.

2641. Podophyllin, Capsicum and Belladonna Pills.—Podophyllin $\frac{1}{4}$ grain, Extract Belladonna $\frac{1}{8}$ grain, Capsicum $\frac{1}{2}$ grain, in each pill.

2642. Podophyllin, Colocynth, Hyoscyamus and Calomel Pills.—Podophyllin, Extract Hyoscyamus, each $\frac{1}{4}$ grain, Compound Extract Colocynth, Calomel, each 1 grain, in each pill.

2643. Podophyllin and Leptandrin Pills.—Podophyllin $\frac{1}{4}$ grain, Leptandrin 1 grain, in each pill.

2644. Quinidine Sulphate Pills.—These are made 1, 2, or 3 grains with excipient in each pill.

2645. Quinine Bisulphate Pills.—These are prepared $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 3, 4, or 5 grains in each pill, with excipient.

2646. Quinine Salts Pills.—Most of the Salts of Quinine, except the Sulphate, are made into 1 grain pills only. Other sizes can of course be made. The Bromide, Carbolate, Salicylate, Sulphocarbolate, Valerianate, etc., are used.

2647. Quinine Sulphate Pills.—Quinine Pills, as they are popularly called, are more extensively used than any other, except perhaps Cathartic Pills. They are made in all sizes, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 3, 4, and 5 grains of Sulphate of Quinine, with excipient in each pill.

2648. Quinine and Aloes Pills.—These contain $\frac{3}{4}$ grain Quinine Sulph. and 1 grain Aloes, in each pill.

2649. Quinine and Arsenic Pills.—Quinine 1 grain, Arsenious Acid $\frac{1}{30}$ grain, in each pill.

2650. Quinine, Arsenic, and Strychnine Pills.—Quinine 1 grain, Arsenious Acid $\frac{1}{30}$ grain, Strychnine $\frac{1}{80}$ grain, in each pill.

2651. Quinine Compound Pills.—Quinine 1 grain. Iron by Hydrogen 1 grain, Arsenious Acid $\frac{1}{30}$ grain.

A great many other combinations of Quinine with other substances are put up, but it is unnecessary to give the formulas.

2652. Rheumatic Pills.—Compound Extract Colocynth $1\frac{1}{2}$ grains, Ex-

tract Colchicum Acet. 1 grain, Extract Hyoscyamus $\frac{1}{8}$ grain, Calomel $\frac{1}{8}$ grain.

2653. Rhubarb Pills.—These are made either of Powdered Rhubarb or of Rhubarb Extract, of various sizes from 2 to 5 grains each. The U. S. official pill is made 3 grains Powdered Rhubarb, 1 grain soap in each.

2654. Rhubarb Compound Pills.—The U. S. formula is Rhubarb 2 grains, purified Aloes $1\frac{1}{2}$ grains, Myrrh 1 grain, Oil Peppermint $\frac{1}{10}$ grain, in each pill. The Br. formula is very similar.

2655. Rhubarb Compound and Blue Mass Pills.—Rhubarb Compound Mass as above 3 grains, Blue Pill 2 grains, in each pill.

2656. Rhubarb Compound and Calomel Pills.—Rhubarb Compound Mass as above $1\frac{1}{2}$ grains, Calomel 1 grain, in each pill.

2657. Salicin Pills.—These are made $2\frac{1}{2}$ and 5 grains of Salicin in each pill with excipient.

2658. Salicylic Acid Pills.—Salicylic Acid $2\frac{1}{2}$ and 5 grains, in each pill.

2659. Salicylic Acid with Morphine Pills.—Salicylic Acid $2\frac{1}{2}$ grains, Morphine $\frac{1}{12}$ grain, also 5 grains Salicylic Acid, $\frac{1}{8}$ grains Morphine, in each pill.

2660. Salol Pills.—These are made 3 and 5 grains of Salol in each pill.

2661. Sandal Wood Extract Pills.—These are made 1 grain or 2 grains of Extract of Sandal Wood in each pill.

2662. Sandal Wood Extract Compound Pills.—Extract Sandal Wood, Pil. Copaiba, each 1 grain, Extract Cubebs, Extract Matico, each $\frac{1}{2}$ grain.

2663. Santonin Pills.—These are made $\frac{1}{2}$ or 1 grain of Santonin in each pill, with Extract Gentian as excipient.

2664. Santonine and Calomel Pills.—Santonin and Calomel, each $\frac{1}{2}$ grain in each pill.

2665. Scammony Compound Pills.—The Br. P. formula is Resin of Scammony, Resin of Jalap, Curd Soap, Strong Tincture of Gentian, each 1 part, made into a mass with Rectified Spirit. The dose is 5 to 15 grains.

2666. Sedative Pills.—Morphine Sulphate $\frac{1}{4}$ grain, Ipecac $\frac{1}{8}$ grain, Camphor $\frac{5}{8}$ grain, Extract Hyoscyamus $1\frac{2}{3}$ grains, in each pill.

2667. Silver Nitrate Pills.—Nitrate of Silver $\frac{1}{4}$ grain, made into a mass with Extract of Gentian in each pill, or an Excipient of 1 part of French Chalk and 2 parts of Petrolatum may be used.

2668. Silver Nitrate and Opium Pills.—Nitrate of Silver and Opium, each $\frac{1}{4}$ grain in each pill.

2669. Squill Compound Pills.—The Br. P. formula is Squill $1\frac{1}{4}$ part, Ginger, Ammoniacum, Hard Soap, each 1 part, Treacle 2 parts or grains, to make a mass of which 5 to 10 grains is a dose.

2670. Strychnine Pills.—These are made with Strychnine $\frac{1}{100}$, $\frac{1}{50}$, $\frac{1}{40}$, $\frac{1}{30}$, $\frac{1}{20}$ grain Strychnine in each pill, with Extract Gentian as excipient.

2671. Strychnine Compound Pills.—Strychnine $\frac{1}{100}$ grain, Phosphorus $\frac{1}{100}$ grain, Extract Cannabis Indica $\frac{1}{10}$ grain, Ginseng, Carbonate Iron, each 1 grain, in each pill.

2672. Sulphur Iodide Pills.—These are made $\frac{1}{25}$ and $\frac{1}{10}$ grain of Iodide of Sulphur, with Extract of Gentian as an excipient, in each pill.

2673. Sumbul Extract Pills.—Extract of Sumbul 1 grain in each pill.

2674. Syphilitic Pills (Ricord's Modified).—Proto-Iodide of Mercury

$\frac{1}{2}$ grain, Lactucarium, Extract Opium, each $\frac{1}{10}$ grain, Extract Conium 1 grain, in each pill.

2675. Tannin Pills.—These are made 1 or 2 grains of Tannin in each pill.

2676. Tartar Emetic Pills.—These are made $\frac{1}{100}$, $\frac{1}{50}$, $\frac{1}{8}$, or $\frac{1}{4}$ grain of the salt in each pill, with Wheat Flour and excipient.

2677. Taraxacum Extract Pills.—Extract of Dandelion 2, 3, or 5 grains in each pill.

2678. Tonic Pills (Dr. Aiken's).—Sulphate Quinine 1 grain, Arsenious Acid $\frac{1}{30}$ grain, Iron by Hydrogen $\frac{3}{4}$ grain, Strychnine $\frac{1}{50}$ grain, in each pill.

2679. Triplex Pills.—Aloes 2 grains, Blue Mass 1 grain, Podophyllin $\frac{1}{4}$ grain, in each pill.

2680. Valerian Extract Pills.—These are made 3 grains in each pill.

2681. Veratrine Pills.—These are made $\frac{1}{50}$ to $\frac{1}{35}$ grain of Veratrine in each pill, with Extract Gentian excipient.

2682. Zinc Oxide Pills.—Oxide of Zinc $\frac{1}{2}$ grain, with excipient, in each pill.

2683. Zinc Phosphide Pills.—These are made $\frac{1}{6}$, $\frac{1}{4}$, and $\frac{1}{2}$ grain of Phosphide of Zinc in each pill, with excipient.

2684. Zinc Phosphide and Nux Vomica Pills.—Phosphide of Zinc $\frac{1}{10}$ grain, Extract Nux Vomica $\frac{1}{4}$ grain, in each pill.

2685. Zinc Phosphide, Nux Vomica and Quinine Pills.—Add 1 grain Quinine Sulphate to each pill as made by the above formula.

2686. Zinc Valerianate Pills.—Valerianate of Zinc 1 grain or 2 grains in each pill.

PIX — PITCH.

Several preparations, consisting of resinous or bituminous substances, prepared in various ways, are known as Pitch. They are similar to but more plastic than resins.

2688. Pix Burgundica — *Burgundy Pitch*.—A prepared concrete resinous exudation from *Abies Excelsa*, containing a small quantity of terpene, $C_{10}H_{16}$, a little water, but composed mainly of resin. It is used chiefly in making plasters and chewing gum.

2689. Pix Canadensis — *Canada Pitch, Hemlock Pitch*.—The prepared resinous exudation of *Abies Canadensis*, consisting mainly of resins, with a little terpene and water. The resinous exudate from hemlock trees is collected and boiled in water, and the mass which rises to the surface strained while hot, the strained product being Hemlock Pitch or Hemlock Gum, which is used chiefly for making plasters.

2690. White Pine Pitch.—The pitchy substance which exudes from pine trees when cut or tapped. When first obtained it is soft and semi-liquid, and commonly known as Pitch. When exposed it hardens, and is known in pharmacy as Turpentine or White Pine Turpentine or Gum (see 2424). The soft pitch is frequently used in making plasters and ointments.

2691. Pix Liquida — *Liquid Pitch or Tar*.—The empyreumatic Oleo-resin obtained by the destructive distillation of the wood of *Pinus Palustris*, is known as *Pine Tar*, which is official. Many other varieties of tar are obtained from the destructive distillation of other wood, as *Birch Tar, Juniper Tar*, etc. Tar is usually obtained as a by-product of charcoal manufacture or the manufacture of Acetic Acid from wood. It consists of volatile products, as Oil of Tar, Creasote, etc., which are vaporized by heat, leaving a black mass, solid when cool, and known as *Black Pitch*, which is used sometimes in plasters and as an ingredient in shoemaker's wax, etc.

2692. Coal Tar — Coal Tar is a residue left after the dry distillation of Coal in the making of illuminating gas. It is extensively used in the arts for various purposes, and in chemistry and pharmacy is the source of a great number of important products. The more important of these products have been mentioned under other headings, as Acid Carbolic or Phenol, Benzol, Aniline, etc.

When Coal Tar is distilled and the product rectified, the lighter products which first come over are separated as a brown, oily liquid, known as *Light Oil*, and consisting of Benzol, C_6H_6 , toluol, C_7H_8 , Xylol, C_8H_{10} , and several other similar substances. Then a black liquid, which is called *Dead Oil*, is distilled, which contains aniline, naphthaline, $C_{10}H_8$, phenol, anthracen, and some other substances. The residue which is not volatilized is a Pitch, known as *Asphalt*, which constitutes about two-thirds of the original volume of coal tar.

PLATINUM.

Symbol, Pl.; Atomic weight, 194.4; Sp. gr., 21.5.

Platinum most nearly resembles gold of any of the metals, and is sometimes called *white gold*. It is a grayish-white metal, one of the heaviest substances known, and is chiefly obtained from alluvial soils in the form of small grains or small rolled masses associated with other metals. Its rarity makes it as expensive as gold, and it is used only to a limited extent in the arts, and scarcely at all in pharmacy and medicine, but in chemistry its uses are important.

Platinum Black is platinum in a very fine state of division, and is used for electrical and chemical tests, it having the power of absorbing oxygen and then imparting it to other combustible substances, thus causing their oxidation.

2693. Platini Chloridum — *Chloride of Platinum*.— This is the only official Salt of Platinum, and is used only in a test solution. It is made by dissolving Platinum in Nitro-hydrochloric Acid to saturation, and then evaporating the solution to dryness.

Like Gold, Platinum forms double salts with Chloride of Ammonium, Chloride of Sodium, and Chloride of Potassium. They may be made in the same manner as Chloride of Gold and Sodium (252).

2694. Spongy Platinum, or *Platinum Sponge*, is made by heating Ammonio-chloride of Platinum to redness, by which the other salts are volatilized, leaving the Platinum in spongy form.

2695. Oxides of Platinum.—With Oxygen, Platinum forms two Oxides: *Platinous Oxide*, PtO_2 , and *Platinic Oxide*, PtO_4 .

PLUMBUM—LEAD.

Symbol, Pb; Atomic weight, 206.5; Sp. gr. 11.45.

Lead is a soft, bluish elementary metal, similar in chemical characteristics to Copper, Silver, and Mercury, but widely differing from them in physical properties. It is obtained chiefly from

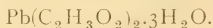
the native sulphide, *Galena*, or lead ore, in which it is often associated with silver and other metals in small proportion. The Galena is roasted in reverberatory furnaces to drive off the sulphur, and the residue smelted with coal and lime, the lead being drawn off and cast into "pigs."

Metallic Lead is largely employed for industrial purposes, but its salts only are used in pharmacy and medicine.

The following are the Salts of Lead official in the pharmacopœias :

2696. **Plumbi Acetas.**

Acetate of Lead, Sugar of Lead.



The U. S. P. gives no process for preparing it. The Br. P. directs :

Oxide of Lead, in fine powder, . . .	24 ounces av.
Acetic Acid, a sufficiency, about . .	38 fl.ounces.
Distilled Water,	20 fl.ounces.

Mix the Acetic Acid and Water, add the Oxide of Lead, and dissolve with the aid of a little heat, filter, evaporate till a pellicle forms, and set aside to crystallize, first adding a little Acetic Acid should the fluid not have a distinctly acid reaction. Drain and dry the crystals on filtering paper without heat.

Uses.—The commercial salt is impure and should not be used medicinally, but is extensively employed in the arts, especially as a mordant for dyeing. The pure salt is a sedative and astringent. It is used internally in the form of pills and powders, in doses of 1 to 3 grains; and externally in solution and other forms of application.

2697. **Plumbi Carbonas.**

Carbonate of Lead, White Lead.



This salt is manufactured on a large scale for paint and other purposes by exposing lead in thin discs to the action of Acetic

Acid, Carbon Dioxide and the atmosphere. For medicinal use it should be purified.

Uses.—Commercial White Lead is extensively used in the arts for painting and other purposes. In medicine it is used in the form of an ointment, and suspended in water for external application.

2698. **Plumbi Iodidum.**

Iodide of Lead.



The Br. P. directs this salt to be made as follows:

Nitrate of Lead, 4 ounces av.
 Iodide of Potassium, 4 ounces av.
 Distilled Water, a sufficiency.

Dissolve the Nitrate of Lead by the aid of heat in 30 ounces of Water, and the Iodide of Potassium in 10 ounces of Water, and mix the solutions. Collect the precipitate on a filter, wash it with distilled water, and dry it in a warm place.

Uses.—This salt is used in pharmacy for preparing ointment and plaster, and sometimes suspended in water as an application.

2699. **Plumbi Nitras.**

Nitrate of Lead.



No formula for this preparation is official, but it may be made by adding Oxide of Lead to Nitric Acid, diluted with an equal quantity of water, heating and dissolving the Oxide to saturation in the liquid, then filtering and concentrating by evaporation and crystallizing.

Uses.—This salt is used in solution as an external application, and for making hair restoratives is preferable to the Acetate, as it has a less disagreeable odor.

2700.

Plumbi Oxidum.*Oxide of Lead, Litharge.*

PbO.

This is Oxide of Lead which has been rendered semi-crystalline by incomplete fusion, and is hence called *Semi-vitrous Oxide of Lead*.

It may be prepared in a small way by heating Nitrate of Lead in a platinum crucible until all its acid has been driven off; but, commercially, it is a by-product of extracting silver from lead ore.

Uses.—Oxide of Lead is a working basis for many of the lead salts, and is used in making plasters and solutions for external use.

Other Salts of Lead.

Besides the official Salts of Lead which have been described, several others are occasionally used in pharmacy.

2701. Arseniate of Lead— $\text{Pb}_3(\text{AsO}_4)_2$ —Made by gradually adding a solution of Acetate of Lead to a solution of Arseniate of Sodium, collecting, washing, and drying the precipitate. As an application to cancers and malignant ulcers.

2702. Bromide of Lead— PbBr_2 .—By adding a solution of Acetate of Lead to a solution of Bromide of Potassium, collecting and washing the precipitate. Uses similar to Iodide of Lead.

2703. Chloride of Lead— PbCl_2 .—By adding gradually to a solution of Acetate of Lead in water Hydrochloric Acid as long as a precipitate is formed, then collecting and drying, or by adding a solution of common salt to the solution of Acetate of Lead.

2704. Chromate of Lead— PbCrO_4 .—By adding a solution of Acetate of Lead gradually to a solution of Bichromate of Potassium and collecting the precipitate. This is a pigment known as *Chrome Yellow*, *Lemon Yellow*, *Leipsic* or *Paris Yellow*.

2705. Bichromate of Lead, which is known as *Chrome Orange* or *Chrome Red*, is made by adding Potassa to the Solution of Bichromate of Potassium before adding the Solution of Acetate of Lead.

2706. Cyanide of Lead.— PbCy_2 .—By adding Hydrocyanic Acid to a Solution of Acetate of Lead as long as a precipitate is formed, and collecting the same.

2707. Oxides of Lead.—Besides the official Oxide of Lead (Litharge), *Binoxide of Lead*, PbO_2 , is made by treating Red Lead with Nitric Acid and collecting the undissolved powder, and *Red Oxide of Lead* or Red Lead, Pb_3O_4 , is made by heating Massicot or unfused Oxide of Lead to a dull red heat in contact with the air until it is converted into a bright red powder. This is also called *Minium*.

2708. Saccharate of Lead.—By adding a Solution of Saccharic Acid to a Solution of Acetate of Lead as long as a precipitate is formed and collecting the same.

2709. Sulphate of Lead.— PbSO_4 .—By dissolving Nitrate of Lead in Water, adding Sulphuric Acid as long as a precipitate is formed, then collecting the precipitate.

2710. Tannate of Lead.—By precipitating a Solution of Acetate of Lead with a Solution of Tannin and collecting the precipitate.

Some other important salts of lead are known, but they are made in the same general manner as the foregoing.

POTASSIUM OR KALIUM.

Symbol, K; Atomic weight, 39; Sp. gr., 0.865.

Potassium is one of the group of four elementary substances (Potassium, Sodium, Lithium, and Ammonium) which, on account of their marked, positive characteristics, are called the Alkali-metals. It was first isolated and described by Sir H. Davy in 1807, and is now chiefly obtained from its carbonate by heating it to a high degree with charcoal, in a retort, when it distills over and is condensed in Naphtha, cooled by ice. It is so readily oxidized that it must be preserved under naphtha or some other hydrocarbon. In water it burns violently and exposed to air is soon converted into an oxide, and its other properties and characteristics are similar to the Alkali-metals in general.

Potassium is the basis of a great variety of salts which are formed by its union with acids and negative elements. They

are as a class very soluble and are of great value in the industrial arts and in pharmacy and medicine. Potassium derives its name from *Potash*, the chief source of the Potassium salts. Potash was formerly made by evaporating the *lye* which is obtained by percolating or lixivating wood ashes, but is now chiefly obtained by decomposing native impure Chloride of Potassium, obtained from mines in Germany. The salts of Potassium are either Alkaline, neutral, or acid according to the proportions in which they are combined. In German pharmacy they are called Kalium salts. The official salts of Potassium constitute a large class, and are as follows:

2711.**Potassa.**

Caustic Potash or Potassa, Hydrate of Potassium.

KHO.

This is prepared by evaporating Solution of Potassa rapidly in a clean iron vessel until an oily fluid remains which will solidify on cooling. It is then poured into cylindrical molds to form "sticks," which, while still warm, are put into dry bottles and tightly sealed. It is sometimes made in the form of powder by stirring while cooling.

Uses.—This is used chiefly as a caustic for morbid growths, excrescences, warts, etc., and in pharmacy may be used for preparing Liquor Potassa (which see) and many salts and preparations of Potassium.

2712.**Potassa cum Calce.**

Potassa with Lime.

Potassa, 50 parts or 1 ounce.

Lime, 50 parts or 1 ounce.

Rub them together in a mortar so as to form a powder and keep in a well-stopped bottle.

Uses.—This is used as a caustic, the same as Potassa, but is milder and slower in its action. Being in powder it is sometimes more convenient.

2713. Potassa Sulphurata.

Sulphurated Potassa.

Sublimed Sulphur, 1 part or 1 ounce.

Carbonate of Potassium, 2 parts or 2 ounces.

Rub the Carbonate of Potassium, previously dried, with the Sulphur, and heat the mixture gradually in a covered crucible until it ceases to swell and is completely melted. Then pour the liquid on a marble slab and when solidified and cold put into well stopped bottles. This is also known as *Liver of Sulphur*, and possesses a very disagreeable odor like rotten eggs.

Uses.—It is sometimes given internally as an alterative and used externally in solution for skin diseases or parasites. It is used by barbers for removing Nitrate of Silver stains.

2714. Potassii Acetas.

Acetate of Potassium.



This may be made most conveniently by adding to pure Acetic Acid crystals of Bicarbonate of Potassium as long as effervescence ensues, then adding a very small quantity of acid and cautiously evaporating to dryness in a porcelain dish by means of a sand-bath.

Uses.—This is given as a diuretic, especially in derangements of the kidneys and bladder, and in rheumatic affections, in doses 10 to 60 grains.

2715. Potassii Bicarbonas.

Bicarbonate of Potassium.



This salt may be made by passing a current of Carbonic Acid Gas through a strong solution of Carbonate of Potassium

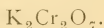
until it is entirely saturated, then filtering the liquid and evaporating at a temperature below 71°C . (160°F .) that it may not be decomposed, and crystallizing when sufficiently concentrated.

Commercially, crude Bicarbonate of Potassium, which is called *Saleratus*, is prepared by suspending a solution of Carbonate of Potassium contained in an open vessel in the fermenting tuns of a brewery, thus utilizing the Carbonic Acid gas produced. When the solution is saturated it is evaporated to dryness.

Uses.—Bicarbonate of Potassium in crystals is largely used in Pharmacy as a source of other Potassium Salts. It is less irritating than the carbonate, and is therefore administered internally when an alkaline Salt of Potassium is desired as an antacid, etc. The dose is from 10 to 30 grains.

2716. Potassium Bichromas.

Bichromate of Potassium.



This is obtained from *Chrome Iron Ore* by first roasting the ore, then powdering, mixing with Carbonate of Potassium and chalk, and heating the mixture to a high temperature in the air. Ferric Oxide and Chromic Acid are produced, the latter combining with the Carbonate of Potassium and forming neutral Chromate of Potassium with evolution of Carbonic Dioxide.

The Solution of Neutral Chromate of Potassium, which is obtained by lixivation with Water, is then treated with Sulphuric or Nitric Acid, and the salt crystallized from the solution.

Uses.—This salt, which is also known as *Red Chromate of Potassium*, is used in pharmacy for making several preparations and as a test-solution. The dose internally is $\frac{1}{10}$ to $\frac{1}{5}$ grain in solution. It is also extensively used in dyeing.

2717. Potassii Bitartras. U. S.

Potassii Tartras Acida, Br.—Bitartrate of Potassium, U. S.
Acid Tartrate of Potassium, Br.—Cream of Tartar.



This is an acid salt of Potassium prepared from *Crude Tartar* or *Argols*, which is deposited in wine casks during the fermentation of grape juice.

Uses.—Cream of Tartar is extensively used as the acid basis of Baking Powder and for other culinary purposes. In medicine it is considerably employed as a mild acid and laxative in doses of $\frac{1}{2}$ to 4 drachms.

2718. Tartaric Acid— $\text{H}_2\text{C}_4\text{H}_4\text{O}_6$.—This is the acid of Cream of Tartar, prepared by dissolving 45 ounces av. of Cream of Tartar in $2\frac{1}{2}$ gallons of boiling Water, adding $12\frac{1}{2}$ ounces av. of prepared chalk, and when effervescence has ceased $13\frac{1}{2}$ ounces av. of Chloride of Calcium dissolved in $2\frac{1}{2}$ pints of Water.

When the Tartrate of Calcium thus found has subsided pour off the liquid and wash the precipitate with Water until tasteless. Then mix 13 fl.ounces of Sulphuric Acid with 60 ounces of Water, pour upon the precipitate, mix thoroughly and boil for half an hour, with repeated stirring, and filter through calico. Evaporate the filtrate at a low temperature until it acquires the sp. gr. of 1.21. Allow to cool, separate and reject the crystals of Sulphate of Calcium which form, then evaporate the remaining liquor until a film forms on the surface, and allow it to cool and crystallize. Finally, purify the crystals obtained by dissolving, filtering, and recrystallizing.

This acid is used in making the Tartrate salts and for other purposes.

2719. Potassii Bromidum.

Bromide of Potassium.



The Br. Official process is to add 2 ounces av. of Bromine in successive portions to 1 pint (Imperial) of Solution of Potash and evaporate to dryness, then mix the powder with wood charcoal in fine powder 1 ounce av., throw, in small quantities at a time, into a red-hot crucible and when all is fused pour

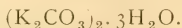
out, and when cooled dissolve in 15 fl.ounces of boiling Distilled Water, filter, evaporate and crystallize.

Another process is to decompose a solution of Bromide of Iron with Carbonate of Potassium, Carbonate of Iron being precipitated and the solution, which contains Bromide of Potassium, filtered, concentrated and crystallized.

Uses.—Bromide of Potassium is one of the most valuable salts used in medicine. It is employed as a nervine and sedative in doses of 20 to 60 grains.

2720. Potassii Carbonas.

Carbonate of Potassium — Sal Tartar.



This salt is obtained from commercial *Pearlash* (impure Carbonate of Potash) by dissolving it in an equal weight of cold Water, “allowing to stand a day or two, filtering the solution and evaporating the filtrate by gentle heat until it thickens, then removing it from the fire and stirring it constantly with an iron spatula until it is in the form of a granular salt, which is known familiarly as “*Salts of Tartar.*”

Uses.—This is considerably used as a basis of other Potassium Salts and internally as an antacid, and externally in some ointments and lotions. The dose is 5 to 15 grains largely diluted. One ounce in 1 gallon of Water makes the *Shampoo Liquid* used by barbers.

2721. Potassii Chloras.

Chlorate of Potassium.



The Br. P. directs this to be made by mixing 20 ounces of Carbonate of Potassium with 53 ounces of slacked Lime, triturating with a few ounces of Water to make the mixture slightly moist, and putting in a carboy; then generating Chlorine Gas from 80 ounces of Black Oxide of Manganese and 24 pints (Imperial) of Hydrochloric Acid with 6 pints (Imperial)

of Water, heated in a retort, on a sand-bath, and conducting the gas thus generated into the carboy containing the mixture of Carbonate of Potassium and Lime until all has passed over. The contents of the carboy are then removed and boiled for 20 minutes with 7 pints (Imperial) of Water, then filtered and the solution evaporated and crystallized. The product is purified by recrystallization.

Uses.—Chlorate of Potassium is extensively used as a source of Oxygen and in pyrotechnics. In medicine, it is used for sore throat, scarlet fever, etc., in doses of 2 to 20 grains. It is quite popular in the form of lozenges and tablets.

2722. Potassii Citras.

Citrate of Potassium.



This salt is conveniently made by adding Bicarbonate of Potassium to a strong Solution of Citric Acid until it no longer effervesces, then filtering the solution and evaporating to dryness.

The Br. P. directs 8 ounces or a sufficiency of Carbonate of Potassium, 6 ounces or a sufficiency of Citric Acid, and 40 fl.ounces of Water. The Acid is to be dissolved in the Water and enough Carbonate of Potassium added to make the solution neutral, then filtered and evaporated to dryness.

Uses.—This salt is considerably used in elixirs and other preparations and in medicine as a diaphoretic and refrigerant. The dose is 15 to 20 grains.

2723. Potassii Cyanidum.

Cyanide of Potassium.



This may be prepared according to the Br. P. process by heating Ferrocyanide of Potassium at a red heat until gas ceases to be evolved, allowing the sediment to subside in the still molten mass, and pouring off the clear fluid. This is

called *fused* Cyanide of Potassium. If desired to be purified, it may be dissolved in spirit, the solution filtered and concentrated by evaporation, and then crystallized.

Uses.—In pharmacy this is used in making several preparations and in medicine it is employed as a sedative the same as Hydrocyanic Acid, in doses of $\frac{1}{8}$ of a grain or less.

2724. Potassii et Sodii Tartras. U. S.

Tartrate of Potassium and Sodium—*Rochelle Salts.* U. S.

Sodæ Tartarata—*Tartrated Soda.* Br.

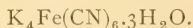


This is made by dissolving 12 ounces av. of Carbonate of Sodium in 5 pints of boiling water, adding 16 ounces av. of Bitartrate of Potassium (Cream of Tartar) to the solution, boiling for a few moments, and then testing to see if the solution is neutral, and adding a little of either of the salts to make it so if it is not. It is then evaporated until a pellicle begins to form, and set aside to crystallize.

Uses.—Rochelle Salt is usually powdered for convenient use, and is employed in pharmacy for making Seidlitz Powders, and in medicine is much used as a laxative and cathartic. The dose is from $\frac{1}{4}$ to 1 ounce dissolved in water.

2725. Potassii Ferrocyanidum.

Ferrocyanide of Potassium—*Yellow Prussiate of Potash.*



This is obtained by heating refuse animal substances, such as horns, hoofs, skins, etc., with Crude Potash in an iron kettle, then lixivating or percolating the mass with hot water, treating with freshly precipitated Carbonate of Iron, filtering the solution, concentrating and crystallizing.

Uses.—This salt is considerably used for dyeing, and as a test for ferric salts, with which it forms a blue color (Ferrocyanide of Iron).

2726. Potassii Hypophosphis.*Hypophosphite of Potassium.*

This salt is prepared by boiling a Solution of Potassa and Phosphorus together, then treating with Carbonic Acid gas to neutralize the excess of Potassa,* evaporating to dryness, dissolving out the Hypophosphite of Potassium with Alcohol, and evaporating to a granular powder. It is also made by double decomposition between Hypophosphite of Calcium and Carbonate of Potassium in solution.

Uses.—This salt is combined with other Hypophosphites in solutions and syrups. It is very deliquescent.

2727. Potassii Iodidum.*Iodide of Potassium.*

The U. S. P. gives no formula for the preparation of this salt, but the Br. P. directs:

Solution of Potash, Br., . . . 1 gallon, Imperial.

Iodine, a sufficiency, about . . 21 ounces av.

Wood Charcoal, in fine powder, . 3 ounces av.

Boiling Distilled Water, a sufficiency.

Put the Solution of Potash into a glass or porcelain vessel and add Iodine in small quantities at a time, with constant agitation, until the solution acquires a permanent brown tint. Evaporate the whole to dryness in a porcelain dish, pulverize the residue and mix it intimately with the Charcoal, throw the mixture, a small quantity at a time, into a red hot crucible and when all has been brought to a state of fusion pour out the contents. When cooled dissolve it in 2 pints (Imperial) of Boiling Distilled Water, filter the liquid through paper, add a little Boiling Distilled Water through the filter, evaporate the liquid till a film forms on the surface, and set aside to crystallize, drain and dry the crystals in a warm place.

In a commercial way other methods are employed which are more economical.

Uses.—Iodide of Potassium is one of the most valuable medicinal salts. It is employed as the source of other Iodides by double decomposition, and in medicine as an alterative and absorbent in scrofula, syphilis, rheumatism, dropsy, etc., and externally in lotions, ointments, and other forms. The dose of this salt is from 2 to 20 grains, or much more in solution.

2728. Potassii Nitras.

Nitrate of Potassium — Saltpetre — Sal Nitre — Nitre.



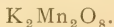
This salt is obtained in some parts of the world as a natural product, but is chiefly made by the process of *Nitrification*. Earth, wood ashes, animal and vegetable refuse, sewage, etc., are mixed together in what are called nitre beds, and by the action of the peculiar ferment which causes nitrification nitre is produced. It is now a well-established fact that nitre is the product of living organisms acting upon appropriate materials. The mixed soils, etc., of the nitre beds, after standing for a long time, are lixivated with water, and the crude Nitre which is obtained by evaporating the liquid, purified and crystallized, in which form it appears in the market.

Uses.—In the arts Nitre is extensively employed as an ingredient of gunpowder and pyrotechnics. In medicine it is used as a diuretic and diaphoretic in doses of 5 to 20 grains, and also used externally in solution.

Sal Prunelle is fused Nitrate of Potassium cast in the form of balls about the size of small marbles.

2729. Potassii Permanganas.

Permanganate of Potassium.



The U. S. P. gives no process for making this salt, but the Br. P. directs:

Caustic Potash,	5	ounces av.
Black Oxide of Manganese,	4	ounces av.
Chlorate of Potassium,	3½	ounces av.
Distilled Water,	43	fl.ounces.
Carbonic Acid, a sufficiency.		

Reduce the Chlorate of Potassium to a fine powder and mix it with the Oxide of Manganese; put the mixture in a porcelain basin and add to it the Caustic Potash previously dissolved in 4 fl.ounces of Water, evaporate to dryness on a sand-bath, stirring well to prevent spurting. Powder the product and place the powder in a covered crucible, exposing it to a dull red heat for an hour or until it has assumed a semi-fluid condition. Let cool, powder it, and boil with 30 fl.ounces of Water, let the insoluble matter decant, pour off the liquid, boil the sediment again with 10 fl.ounces of Water, pour off the liquid and add to that previously reserved, saturate with Carbonic Acid gas and evaporate until a pellicle forms on the surface, then set aside to cool and crystallize; drain the crystalline mass, boil it in 6 ounces of Water, strain through a little asbestos in a funnel, again crystallize, drain the crystals and dry them under a bell jar over a vessel containing Sulphuric Acid.

Uses.— This salt is used as an antiseptic, disinfectant, and oxidizing agent. It is given internally in small doses in solution and applied externally to putrescent or gangrenous wounds, sores, ulcers, etc.

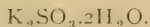
2730.

Potassii Sulphas.*Sulphate of Potassium.*

Sulphate of Potassium is produced as a by-product of the manufacture of several other more important salts. It may be made by decomposing Nitrate of Potassium with Sulphuric Acid.

Uses.— In pharmacy this salt has been mainly used in making Powder of Ipecac and Opium, in which it acts as a diluent.

2731.

Potassii Sulphis.*Sulphite of Potassium — Neutral Potassium Sulphite.*

This salt, which is official in the U. S. P., is made by passing a current of Sulphurous Acid gas through a concentrated Solution of Carbonate of Potassium until the Carbonic Acid

gas is expelled and the liquid is strongly acid, then adding an equal weight of Carbonate of Potassium, evaporating and crystallizing, making *Neutral Potassium Sulphite*.

Uses.—This salt is given in doses of 10 to 60 grains as an anti-ferment in bowel troubles, etc., and is sometimes used to prevent fermentation in juices, etc.

2732. Potassii Tartras.

Tartrate of Potassium—*Neutral Tartrate of Potassium*.



The U. S. P. gives no formula, but the Br. P. directs:

Acid Tartrate of Potassium

(Cream Tartar), . . . 20 ounces or a sufficiency.

Carbonate of Potassium, . 9 ounces or a sufficiency.

Boiling Distilled Water, . 50 ounces.

Dissolve the Carbonate of Potassium in the Water, add the Cream Tartar a little at a time, and if, after a few minutes' boiling, the liquid is not neutral to test-paper, make it so by the careful addition of more of the Carbonate or Cream Tartar; then filter, evaporate till a pellicle forms and set aside to crystallize. This is known as Neutral Tartrate, and Cream of Tartar is known as Acid Tartrate of Potassium.

Uses.—This is used as a laxative in small doses and as a purgative in doses of $\frac{1}{2}$ to 1 ounce. It is used in making Fehling's Solution.

Other Potassium Salts.

The foregoing official Salts of Potassium are all that are used to any extent in Pharmacy and Medicine, but a number of others are prepared and sometimes called for, the more important being as follows:

2733. Antimoniates of Potassium.—The Acids of Antimony combine with Potassium the same as other Acids forming normal or neutral and Acid Salts.

Antimoniate of Potassium— KSbO_3 .—Is the normal Salt produced by heating 1 part of Metallic Antimony with 4 parts of Nitrate of Potassium in

a crucible, washing the powdered mass with Water, boiling it with Water for an hour or two, which converts a portion of it into a soluble salt, obtained by filtering the solution and evaporating to dryness.

Acid Antimoniate of Potassium— $K_2Sb_4O_{11}$.—May be made by passing a current of Carbonic Acid gas through the normal Salt. Acid Metantimoniate of Potassium is also prepared and used as a test for Sodium.

2734. Arseniate of Potassium— KH_2AsO_4 .—Heat Arsenious Acid (Anhydride) and Nitrate of Potassium, each in powder, 1 part in a glass flask to dull redness until the mixture fuses and red vapors cease to be evolved. Dissolve the residue when cold in 50 parts of boiling Distilled Water, filter, concentrate the solution by evaporation and crystallize. Dose $\frac{1}{16}$ to $\frac{1}{8}$ grain in solution.

2735. Bisulphate of Potassium— $KHSO_4$.—This is the residue left in the retort after preparing Nitric Acid from Nitrate of Potassium and Sulphuric Acid.

2736. Bisulphite of Potassium— $KHSO_3$.—By passing an excess of Sulphurous Acid Gas into a concentrated solution of Carbonate of Potassium.

2737. Borate of Potassium— $K_4B_4O_8$.—By heating equal parts of dry Carbonate of Potassium and Boric Acid in powder in a covered crucible, dissolving the sublimed mass in boiling Water, filtering the solution, concentrating and crystallizing. The dose is 1 to 6 grains, for dissolving calculi, etc.

2738. Borotartrate of Potassium.—By heating 4 parts of Cream Tartar with 1 part Boric Acid in 10 parts or sufficient Water to dissolve them, then evaporating to dryness. This is also called *Soluble Cream of Tartar*. It is very soluble and deliquescent. Used for gout and lithic calculi in doses of 15 to 30 grains, and as a laxative in doses of 2 or 3 drachms.

2739. Chloride of Potassium— KCl .—This is obtained as a by-product in the manufacture of Chlorate of Potassium and other Salts, or may be made by neutralizing a solution of Carbonate of Potassium with dilute Hydrochloric Acid, evaporating and crystallizing. Dose 10 to 30 grains.

2740. Chromate of Potassium— K_2CrO_4 .—By adding Carbonate of Potassium to a hot solution of Bichromate of Potassium until effervescence ceases, concentrating and crystallizing. In a large way it is made direct from Chrome Ore, and is extensively used in dyeing.

2741. Cyanate of Potassium— $KCNO$.—This may be made by mixing Ferrocyanide of Potassium and Litharge and heating, then dissolving out the Cyanate from the fused mass by Alcohol, and crystallizing.

2742. Ferricyanide of Potassium— $K_4Fe_2Cy_{12}$.—By passing Chlorine Gas into a cold solution of Ferrocyanide of Potassium until it ceases to give a blue precipitate with Chloride of Iron. It is used as a test.

2743. Iodate of Potassium— KIO_3 .—This is made during the manufacture of Iodide of Potassium, and may be obtained by dissolving out the

Iodide of Potassium before heating the mixture in a crucible, with Alcohol, and dissolving the residue which is the Iodate in hot Water and crystallizing.

2744. Iodohydrargyrate of Potassium.— This is made by dissolving 2 parts of Iodide of Potassium in a small quantity of hot Water and adding to the solution 3 parts of Iodide of Mercury, upon cooling the salt crystallizes. It is used as a test.

2745. Nitrite of Potassium— KNO_2 .— By heating Nitrate of Potassium to redness, dissolving the fused mass in a little Water, adding twice the volume of the solution of Alcohol and after a few hours decanting the upper stratum, separating the crystals from the lower stratum and evaporating to dryness.

2746. Oxalates of Potassium.— With Oxalic Acid Potassium forms several Salts, as follows:

Oxalate of Potassium, $\text{K}_2\text{C}_2\text{O}_4$, by neutralizing a solution of Oxalic Acid with Carbonate of Potassium, evaporating and crystallizing.

Binoxalate of Potassium, KHC_2O_4 , also called *Salts of Sorrel*, or *Salts of Lemon*. By saturating a solution of Oxalic Acid 1 part with Carbonate of Potassium and adding to the mixture 1 part of Oxalic Acid, evaporating and crystallizing.

Quadroxalate of Potassium. By neutralizing 1 part of Oxalic Acid in solution with Carbonate of Potassium, then adding 3 parts of Oxalic Acid, concentrating and crystallizing.

The two last are used to remove iron rust, ink stains, etc., and are generally sold under the name *Salts of Lemon*; a simple mixture of powdered Oxalic Acid 4 parts and powdered Carbonate of Potassium 1 part being generally put up for this purpose.

2747. Perchlorate of Potassium— KClO_4 .— By heating Chlorate of Potassium until it melts, and keeping at this temperature until gas ceases to be evolved, then dissolving in Water and crystallizing.

2748. Salicylate of Potassium— $(\text{KC}_7\text{H}_5\text{O}_3)_2 \cdot \text{H}_2\text{O}$.— This Salt may be made by dissolving 7 parts of Bicarbonate of Potassium in Water, and gradually adding 10 parts of Salicylic Acid and evaporating to dryness.

2749. Silicate of Potassium— K_2SiO_3 .— By fusing 10 parts of Carbonate of Potassium with 15 parts of fine sand and 1 part of Charcoal a salt is obtained similar to Silicate of Sodium, which is used for making Water Glass.

2750. Sulphide of Potassium— K_2S .— By passing a current of Sulphuretted Hydrogen into a solution of Potassa as long as it is absorbed, then adding an equal quantity of solution of Potassa and evaporating. See also (2713).

2751. Sulphocarbonate of Potassium— K_2CS_3 .— By mixing a solution of Sulphide of Potassium with Bisulphide of Carbon and evaporating without heat.

2752. Sulphocyanate of Potassium— KSCN .— By melting together 17 parts of Carbonate of Potassium, 32 parts of Sulphur and 46 parts Anhydrous

Ferrocyanide of Potassium and heating to redness, exhausting with Water, evaporating the solution to dryness, powdering and exhausting with Alcohol and crystallizing. This is chiefly used as a test for Ferric Oxide.

Other Salts of Potassium are known, but the foregoing are all that are liable to be called for.

PROPYL OR TRITYL.



The gaseous radical of which Propylic Alcohol, $\text{C}_3\text{H}_7\text{HO}$, is the hydrate is known as Propyl or Trityl. Propylic Alcohol is a fusel oil obtained from the fermented residuum of expressed grapes after the marc-brandv has passed over. It is also called fusel oil of marc-brandv.

It combines with Ammonia, forming Propylamine, with Phenol, forming Phenol-Propyl-Alcohols, etc.

PULVERES — POWDERS.

Aside from the general meaning of the word Powder or Powders as describing any finely comminuted substance, the term is applied in Pharmacy to a class of Compound Powders which have been adopted as convenient or efficient preparations to be dispensed in this form. Other Powders, as Tooth Powders, Face Powders, etc., are found under their proper headings, only these which are intended to be used as medicine being included here.

The following are those official in the leading Pharmacopœias:

2753. Pulvis Aërophorus. G. P.

Effervescing Powder.

Bicarbonate of Sodium,	10 parts.
Tartaric Acid,	9 parts.
Sugar,	19 parts.

Dry them separately in fine powder at a gentle heat and then mix them intimately. When mixed with water they effervesce with liberation of carbonic acid gas.

2754. Pulvis Aërophorus Anglicus.*Soda Powders.*

The German formula under the above title is:

Bicarbonate of Sodium, put up in a blue paper, . . . 2 grammes.

Tartaric Acid, put up in a white paper, 1½ gramme.

Under the title *Pulveres effervescentes* they were official in the 1870 U. S. P. Bicarbonate of Sodium 360 grains and Tartaric Acid 300 grains were each put up separately in 12 powders each.

When given, one of each of the powders is dissolved in one ounce of Water and the solution mixed and drank during effervescence.

2755. Pulvis Amygdalæ Compositus. Br.*Compound Powder of Almonds.*

Sweet Almonds, 8 ounces or 8 parts.

Refined Sugar, 4 ounces or 4 parts.

Gum Acacia, 1 ounce or 1 part.

Blanch the Almonds, dry them thoroughly and powder them, then mix with the Gum and Sugar. This is used for making mixture of almond.

2756. Pulvis Antimonialis.*Antimonial Powder — James Powder.*

Oxide of Antimony, 1 ounce or 1 part.

Precipitated Phosphate of Calcium, 2 ounces or 2 parts.

Mix them intimately. Dose 3 to 5 grains.

2757. Pulvis Aromaticus. U. S.*Aromatic Powder.*

Cinnamon, No. 60 powder, 7 drachms.

Ginger, No. 60 powder, 7 drachms.

Cardamom, No. 60 powder, 3 drachms.

Nutmeg, No. 60 powder, 3 drachms.

Mix them intimately.

Under the title *Pulvis Cinnamomi Compositus*, *Compound Powder of Cinnamon*, the Br. P. directs Cinnamon, Cardamom Seeds and Ginger, each in fine powder, 1 ounce.

Aromatic Powder is used for making several preparations, and as an addition to other powders.

2758. Pulvis Catechu Compositus. Br.*Compound Powder of Catechu.*

Catechu, in powder,	4 ounces or 4 parts.
Kino, in powder,	2 ounces or 2 parts.
Rhatany, in powder,	2 ounces or 2 parts.
Cinnamon, in powder,	1 ounce or 1 part.
Nutmeg, in powder,	1 ounce or 1 part.

Mix them thoroughly, pass the powder through a fine sieve and rub it lightly in a mortar. Dose 20 to 40 grains as an astringent for bowel complaints, etc.

2759. Pulvis Cretæ Compositus. U. S.*Compound Chalk Powder.*

Prepared Chalk,	30 parts or 3 ounces.
Acacia,	20 parts or 2 ounces.
Sugar,	50 parts or 5 ounces.

Mix them intimately.

This powder is used for making chalk mixture and is given in powder for summer complaints and teething, in doses of 10 to 60 grains.

The *Aromatic Powder of Chalk* of the Br. P. is Cinnamon 4 ounces, Nutmeg 3 ounces, Saffron 3 ounces, Cloves 1½ ounce, Cardamom Seeds 1 ounce, Refined Sugar 25 ounces, Prepared Chalk 11 ounces, all in powder, and intimately mixed.

2760. Pulvis Cretæ Aromaticus cum Opio. Br.*Aromatic Powder of Chalk and Opium.*

Aromatic Powder of Chalk, Br.,	39 parts.
Opium, in powder,	1 part.

Mix them thoroughly, pass the powder through a fine sieve and finally rub it lightly in a mortar. The dose is 10 to 40 grains, for looseness of the bowels.

2761. Pulvis Effervescens Compositus. U. S.*Seidlitz Powders — Aperient Effervescing Powders.*

Bicarbonate of Sodium,	480 grains.
Tartrate of Potassium and Sodium,	1440 grains.

Mix them intimately together and divide into 12 powders, which are to be put up in blue papers.

Tartaric Acid, in fine powder, 420 grains.

Divide into 12 powders, which are to be put up in white paper.

When taken the contents of one of the blue papers is to be dissolved in about $1\frac{1}{2}$ ounce of water, and the contents of one white paper in about one ounce of water. The solutions are then to be mixed and immediately drank during effervescence.

The German *Pulvis Aërophorus Laxans* is about the same.

2762. Seidlitz Mixture is prepared with 1 part of Bicarbonate of Sodium and 3 parts of Tartrate of Potassium (Rochelle Salt) intimately mixed.

Seidlitz Measures made of boxwood may be had, by which a sufficient quantity of the mixture is taken for each powder.

2763. Pulvis Elaterini Compositus. Br.

Compound Powder of Elaterin.

Elaterin, 5 grains or 1 part.

Sugar of Milk, 195 grains or 39 parts.

Rub them together in a mortar until they are reduced to a fine powder and intimately mixed. Dose $\frac{1}{2}$ to 5 grains.

This contains only $2\frac{1}{2}$ per cent. of Elaterin. The U. S. Trituration of Elaterin contains 10 per cent.

2764. Pulvis Glycyrrhizæ Compositus.

Compound Powder of Glycyrrhiza or Liquorice.

The U. S. formula is :

Senna, in powder, 18 parts or $2\frac{1}{4}$ ounces.

Liquorice Root, in powder, 16 parts or 2 ounces.

Fennel, in powder, 8 parts or 1 ounce.

Washed Sulphur, 8 parts or 1 ounce.

Sugar, in fine powder, 50 parts or $6\frac{1}{4}$ ounces.

Mix them thoroughly by rubbing together and passing through a sieve.

The Br. formula differs but slightly from this in proportion of ingredients and corresponds with the German *Pulvis Liquiritæ Compositus*, which is Senna, Liquorice, each 2 parts, Fennel, Washed Sulphur, each 1 part, Sugar 6 parts.

This is also called *Laxative Powder* and *Brustpulver*, and is used both as a laxative and pectoral, in doses of half to a teaspoonful or more in a little water.

2765. Pulvis Gummosus. G. P.*Compound Powder of Acacia — Gummipulver.*

Acacia,	15 parts or 3 ounces.
Liquorice Root,	10 parts or 2 ounces.
Sugar,	5 parts or 1 ounce.

Used in cough mixtures, etc.

2766. Pulvis Ipecacuanhæ et Opii. U. S.

Pulvis Ipecacuanhæ Compositus, Br.—*Pulvis Ipecacuanhæ Opiatus, G. P.*
 —*Dover's Powder*—*Powder of Ipecac and Opium*—
Compound Powder of Ipecacuanha.

The present U. S. formula is :

Ipecac, in powder,	10 parts or 1 ounce.
Opium, in powder,	10 parts or 1 ounce.
Sugar of Milk, in powder,	80 parts or 8 ounces.

Rub them together to a very fine powder.

The German preparation is identical with this.

The Br. formula corresponds with the 1870 U. S. formula, using Sulphate of Potassium in fine powder instead of Sugar of Milk. This formula is still preferred, and with good reason, by many practitioners.

2767. Pulvis Jalapæ Compositus.*Compound Powder of Jalap.*

The U. S. formula is :

Jalap, in powder,	35 parts or 1 ounce.
Bitartrate of Potassium, in powder,	65 parts or 2 ounces.

Rub them together until they are thoroughly mixed.

The Br. formula is Jalap, in powder, 5 parts, Acid Tartrate of Potassium (Cream of Tartar) 9 parts, Ginger, in fine powder, 1 part.

The dose of this powder is 20 to 60 grains, usually given in syrup.

2768. Pulvis Kino Compositus. Br.*Compound Powder of Kino.*

Kino, in powder,	3¾ ounces or 15 parts.
Opium, in powder,	¼ ounce or 1 part.
Cinnamon, in powder,	1 ounce or 4 parts.

Mix them intimately. The dose is 5 to 20 grains for looseness of the bowels, etc.

2769. Pulvis Morphinae Compositus.*Compound Powder of Morphine—Tully's Powder.*

This preparation was introduced by Dr. Tully, and has been quite popular with physicians as a substitute for Dover's Powder.

Sulphate of Morphine,	1 part or 22 grains.
Camphor,	20 parts or 1 ounce av.
Liquorice Root, in powder,	20 parts or 1 ounce av.
Precipitated Carbonate of Calcium,	20 parts or 1 ounce av.
Alcohol, a sufficient quantity.	

Powder the Camphor by rubbing it with a little Alcohol, then add the Liquorice and Chalk, and rub to a uniform powder. Rub the Morphine first with a small portion of the powder, then gradually add the remainder, rubbing them intimately together.

Another form of Tully's Powder is made with Opium 60 grains, Camphor, Liquorice, and precipitated Chalk, each 180 grains, powdered and thoroughly mixed.

2770. Pulvis Opii Compositus. Br.*Compound Powder of Opium.*

Opium, in powder,	1½ ounce or 3 parts.
Black Pepper, in powder,	2 ounces or 4 parts.
Ginger, in powder,	5 ounces or 10 parts.
Caraway Fruit, in powder,	6 ounces or 12 parts.
Tragacanth, in powder,	½ ounce or 1 part.

Mix them thoroughly. The dose is 2 to 5 grains for bowel trouble, etc. This powder is used for making confection of Opium, 1 part to 4.

2771. Pulvis Rhei Compositus.*Compound Powder of Rhubarb—Gregory's Powder.*

The U. S. formula is

Rhubarb, in powder,	25 parts or 2½ ounces.
Magnesia (calcined),	65 parts or 6½ ounces.
Ginger, in powder,	10 parts or 1 ounce.

Rub them thoroughly together.

The Br. formula is

Rhubarb,	2 ounces.
Light Magnesia,	6 ounces.
Ginger,	1 ounce.

The German formula for *Powder of Magnesia and Rhubarb* is:

Rhubarb,	15 parts.
Oleo-Saccharate of Fennel,	40 parts.
Carbonate of Magnesium,	60 parts.

The dose of this powder is from 20 to 60 grains, as a laxative and antacid stomachic.

2772. Pulvis Salicylicus cum Talco. G. P.

Powder of Salicylic Acid and Talc.

Salicylic Acid,	3 parts.
Wheat Starch,	10 parts.
Talc,	87 parts.

Mix them thoroughly. This powder is used as a dusting for chapped or inflamed surfaces, or as a Baby Powder.

2773. Pulvis Scammonii Compositus. Br.

Compound Powder of Scammony.

Scammony Resin, in powder,	4 ounces or 4 parts.
Jalap, in powder,	8 ounces or 8 parts.
Ginger, in powder,	1 ounce or 1 part.

Mix them thoroughly. This is used as a cathartic in doses of 10 to 20 grains.

2774. Pulvis Tragacanthæ Compositus.

Compound Powder of Tragacanth.

Tragacanth, in powder,	1 ounce or 1 part.
Gum Acacia, in powder,	1 ounce or 1 part.
Starch, in powder,	1 ounce or 1 part.
Refined Sugar, in powder,	3 ounces or 3 parts.

Rub them well together. Dose, 20 to 60 grains.

Unofficial Powders.

The foregoing powders include those official in the leading pharmacopœias, but many others are used in pharmacy. The

following are the more important unofficial powders used in medicine which are not included under other headings :

2775. Aloes and Canella Powder.

Pulvis Aloes et Canella (Hiera Picra).

This powder was formerly official under the above title :

Socotrine Aloes, in fine powder, 4 ounces.

Canella, in fine powder, 1 ounce.

Rub them together until they are thoroughly mixed. This is familiarly known as " Picra," and used as a bitters, physic and vermifuge.

Liquid Picra may be prepared by macerating $1\frac{1}{2}$ ounce av. of the above powder in diluted alcohol 1 pint, and filtering.

2776. Aloes Powder Compound.

Aloes, in fine powder, 3 ounces.

Guaiacum Resin, in fine powder, 2 ounces.

Aromatic Powder, 1 ounce.

Rub them well together. This is a warm, sudorific, purgative, in doses of 10 to 20 grains.

2777. Aloes and Iron Powder.— Aloes $1\frac{1}{2}$ ounce, Myrrh 2 ounces, Sulphate of Iron 1 ounce, Extract of Gentian dried, 1 ounce, all in fine powder and thoroughly mixed. Dose 10 to 20 grains.

2778. Calomel and Jalap Powder.— Calomel 1 part, Jalap 2 parts, intimately mixed. The dose is 20 to 30 grains as a purgative, in syrup. This was the popular physic of our grandfathers but has been mostly superseded by other less heroic preparations.

2779. Composition Powder — (Thompsonian).— Bayberry Bark 1 pound av., Ginger, Cloves, Capsicum, each 1 ounce av. All in fine powder and intimately mixed. A teaspoonful in a cup of boiling water, to be drunk hot, as a diaphoretic, etc.

Another formula is :

Hemlock Bark 2 pounds, Bayberry Bark 1 pound, Ginger $\frac{1}{2}$ pound, Capsicum, Cloves, each 1 ounce, all in fine powder and intimately mixed. This powder is not so strong as the preceding, and the Hemlock Bark is considered an addition to its diaphoretic properties. The dose is 1 or 2 teaspoonsful prepared as above.

2780. Cubebs and Alum Powder.— Cubeb, in fine powder, 4 ounces, Alum, in fine powder, 1 ounce. Mix them. The dose is 2 drachms or less for Gonorrhœa or other vitiated discharges. One part of this powder may be mixed with 4 parts of Syrup and given in this form.

2781. Diapente Powder.—Serpentaria, Gentian, Bayberry, Myrrh, Phosphate of Lime, each in fine powder equal parts, thoroughly mixed.

2782. Fumigating Powder.—Amber, Mastich, Olibanum, each 3 parts, dry Storax 2 parts, Benzoin and Labdanum, each 1 part, all in coarse powder and well mixed, to be burned on hot coals.

2783. Insect or Fly Powder.—This is the powdered unexpanded flowers of *Pyrethrum Roseum* or Persian Chamomile. It is not poisonous except to insects which breathe by tracheæ on their sides, and are asphyxiated by it.

2784. Worm Powder.—Worm Powders are made in great variety, but are chiefly composed of Santonine combined with some laxative, as Santonine 60 grains, Calomel 60 grains, Sugar of Milk 60 grains, rubbed together and divided into 30 powders, one of which may be given to a child of 6 to 10 years old before meals.

2785. PYROXYLINUM.

Pyroxylin—Soluble Gun Cotton.

This is made by the U. S. P. as follows:

Cotton,	1 part or 1 ounce.
Nitric Acid,	10 parts or 10 ounces.
Sulphuric Acid,	12 parts or 12 ounces av.
Alcohol,	} each a sufficient quantity.
Stronger Ether,	
Water,	

Mix the Acids gradually in a glass or porcelain vessel, and when the temperature of the mixture has fallen to 30° C. (90° F.) add the Cotton. By means of a glass rod imbue it thoroughly with the Acids and allow it to macerate for 10 hours or until a sample of the Cotton taken out, washed thoroughly with Water, and subsequently with Alcohol and pressed, is found to be soluble when shaken in a test-tube with a mixture of 1 volume of Alcohol and 3 volumes of stronger Ether. Then remove the Cotton from the Acids and wash thoroughly with successive portions of cold Water and afterwards with boiling Water, then drain and dry by heat of a water-bath.

Soluble Gun Cotton, as thus prepared, is chemically *Dinitro Cellulin*, and is soluble in a mixture of Alcohol and Ether, making the *Collodion* of pharmacy. It combines with Camphor, making *Celluloid*, which, by pressure, is made into a hard, flexible substance used for making toilet and other fancy articles, imitating ivory and other substances by adding coloring ingredients. It is extensively manufactured from wood-paper pulp for this purpose.

By varying the strength of the Nitric Acid used three kinds of Gun Cotton may be prepared varying in soluble properties—*Mononitro-Cellulin* being but slightly explosive and insoluble, *Dinitro-Cellulin* (the official pyroxylin) being more explosive and soluble in a mixture of Alcohol and Ether, and *Trinitro-Cellulin*, which is made with the strongest acids, being very explosive but insoluble. This is the Gun Cotton chiefly used for mining operations.

RESINÆ — RESINS.

Including Gums, Gum-Resins, and Resinous Substances.

Resins, as understood in pharmacy, are substances obtained from vegetable matters, insoluble in water but soluble in oils, alcohol or ether, and, obtained as natural exudates, or as residues by distillation from oleo-resins or turpentine, or by precipitation from alcoholic fluid extracts of drugs in which they naturally exist as active principles.

The Gums, Gum-Resins, and Resinoids are also included in this section as they have similar origin and characteristics.

2786.

Resina.

Resin — Colophony.

The residue left after distilling off the volatile oil from the crude turpentine obtained from various species of *Pinus*. It is often improperly called Rosin. It is a hard, brittle, transparent substance, from a very pale to a dark amber color, and consists of *Abietic Anhydride*, which, when treated with dilute alcohol, is converted into *Abietic Acid*.

Uses.—Resin is extensively used in the industrial arts for various purposes and in pharmacy is employed to impart adhesiveness to ointments, cerates, and plasters.

Resin Oil is an oil obtained by the dry distillation of Resin. It is used for lubricating, etc., being first made into a soap with slacked lime. It is an ingredient of axle-grease.

2787.

Resina Copaibæ.*Resin of Copaiba.*

The residue left after distilling off the volatile oil from Copaiba. It is a yellowish, brittle resin, of a weak odor and taste of Copaiba, and an acid reaction. It is used to combine with Copaiba and Oil of Cubebs, making "*Extract of Cubebs and Copaiba*," a paste or soft mass, used for Gonorrhœa.

2788.

Resina Damar.*Demar Resin.*

A Resin obtained from various species of *Damara*, found in Southern India. It is a clear or light amber-colored Resin, used for making Demar Varnish by dissolving in Oil of Turpentine, and as a dusting for various purposes. It is official in the G. P.

2789.

Resina Jalapæ.*Resin of Jalap.*

Jalap, in No. 60 powder,	. . . . .	16 ounces av.
Alcohol, }	. . . . .	each a sufficient quantity.
Water, }	

Exhaust the Jalap by percolating with Alcohol in the water-bath percolator as directed (1069), and evaporate the percolate by distillation to 6½ fl.ounces, which add to one gallon of water, gradually, and with constant stirring, wash the precipitate with fresh water. Drain, press and dry by gentle heat. This is used as a cathartic, usually in Pills.

2790.

Resina Podophylli.*Resin of Podophyllum — (Podophyllin.)*

Podophyllum, in No. 60 Powder,	. . . . .	16 ounces.
Hydrochloric Acid,	. . . . .	1 fl.drachm.
Alcohol, }	. . . . .	each a sufficient quantity.
Water, }	

Exhaust the Podophyllum by percolating with Alcohol in the water-bath percolator as directed (1069) and evaporate the percolate by distillation to the consistence of Honey, which is then to be slowly added, with constant stirring, to 1 pint of Water, previously cooled by ice and mixed with the

Hydrochloric Acid. Wash the precipitate twice with cold water, drain, press and dry in a cool place.

This is more commonly called *Podophyllin*, and is the active principle of Mandrake or May-apple root.

Uses.—This is extensively used in the manufacture of Liver and Cathartic Pills and given in powders. The dose is $\frac{1}{8}$ to 1 grain.

2791.

Resina Scammonii.

Resin of Scammony.

Scammony, in No. 60 Powder, 16 ounces av.

Alcohol, { each a sufficient quantity.
Water, }

Digest the Scammony with successive portions of boiling Alcohol until exhausted. Mix the tinctures thus obtained, and evaporate by distillation to a syrupy consistence. Then add the residue to $2\frac{1}{2}$ pints of water, wash the precipitate with water and dry it with gentle heat.

Uses.—Resin of Scammony is used in making pills, powders, etc. The dose is from 3 to 10 grains.

The foregoing Resins are official in the leading pharmacopœias. The following unofficial Resins are considerably used :

2792. Amber—*Succinum*.—Also called *Electron* from its property of generating electricity. A fossil-resin, supposed to have been produced by species of *Pinus* now extinct. It is used for making ornaments, mouth-pieces of pipes, etc. By dry distillation it yields Acetic Acid and Oil of Amber, which pass over as liquids into the receiver, and *Succinic Acid*, $H_2C_4H_4O_4$, which sublimes and gathers in the neck of the retort, and which combines with bases forming *Succinates*. Amber is extensively used for making fine varnishes.

2793. Anime—*Gum-Anime*, *West India Copal*.—A pale brownish-yellow, brittle, transparent Resin, obtained from a species of locust in the West Indies. It emits a very fragrant odor when burned, and is used as a fumigation for asthma and in solution is externally applied. It is used in making pastilles and for varnishes.

2794. Asphaltum.—A black, hard, brittle variety of bitumen found in various parts of the world as a natural exudation from the earth. It is also called Mineral Pitch, Fossil Bitumen, etc. It is not properly included with the Resins but has similar characteristics.

Liquid Asphaltum.—This is prepared as a *Black Japan* or gloss varnish by melting Asphaltum $\frac{1}{2}$ pound av., adding Balsam Copaiba, heated, 1 pound, and thinning with Oil of Turpentine. Ordinary Black Asphaltum Varnish is made by melting Asphaltum and adding twice its weight of hot Oil of Turpentine.

2795. Caoutchouc—*India Rubber*—*Resina Elastica*.—This is the concrete juice of several species of *Elastica* found in tropical countries. The fresh milky juice is spread over mounds of unbaked clay and exposed to heat by torches, from which its smoky color is derived. Successive layers of the juice are spread on until the mass is sufficiently thick and hard, when the clay is broken. India Rubber is extensively used in the arts, for a great variety of purposes. Its solution in ether or benzol is used as an adhesive and a water-proof covering for fabrics.

Vulcanized Rubber or *Hard Rubber* is made by combining Caoutchouc with from 12 to 15 per cent. of Sulphur, by heating them together. It is used for making a great variety of useful and ornamental articles.

2796. Copal—*Gum Copal*.—A resinous exudate from various species of locust and other trees found in tropical countries. The variety obtained from East India is known as *Gum Anime* (2793), that from the West Indies is known as Copal. These resins are extensively used in the manufacture of varnishes.

2797. Dragon's Blood—*Sanguis Draconis, Resina Draconis*. A rich-red resin obtained from the fruit of *Calamus Draco*, a species of palm, by beating or shaking the fruit in a bag, which breaks off the resin, which is then separated, melted and run into reed moulds or masses as it appears on the market. Its solution is used for coloring some medicinal substances, varnishes and lacquers.

2798. Guaiac Resin—*Gum Guaiac*.—This Resin is obtained by various means from *Guaiacum Officinale* and contains *Guaiacic Acid*, $C_{12}H_{16}O_6$, and several other similar compounds. By dry distillation an Oil is obtained containing *Guaiacol*, $C_7H_8O_2$, *Guaiacene*, C_8H_8O , and other compounds.

Uses.—Guaiac Resin is used in making several preparations, and in medicine is employed for gout, rheumatism, etc., either in solution or in powder.

2799. Gutta-Percha.—This is a substance resembling India Rubber, obtained from *Isonandro Gutta*, growing only in the Malayan Archipelago. The tree is notched or tapped and the milky juice which exudes exposed to the air for some time when it solidifies, forming the Gutta Percha of commerce. It is purified and made into sheets which are elastic, pliable and tough, and may be moulded into any desired form. Its solution in Benzol or Bisulphide of Carbon is used for adhesive purposes, and for making water-proof fabrics.

2800. Lac.—A resinous substance, combined with considerable coloring matter, obtained from the branches of several tropical trees and produced by the puncture of an insect, *Coccus lacca*. The crude resinous substance is *Stick Lac*. *Shellac* is prepared by melting the resin in long linen bags before a fire and spreading it on bamboo in thin layers. It is obtained in scales. It is used as a varnish and for making sealing wax, etc.

Lac Dye is the coloring matter obtained from Lac by washing with water, and *Seed Lac* is the residue obtained after dissolving out most of the coloring matter from the crude Lac.

2801. Mastic — *Gum Mastic*.— A resin obtained from *Pistacia Lentiscus* by incising the bark and collecting the exudate. It occurs in tears, is soluble in Alcohol and in Oil of Turpentine, and is used for making a varnish for pictures and for making cements, and as a dusting for gilding on leather, cloth, etc. for bookbinders' use.

2802. Sandarach — *Gum Sandarach*.— This is a resinous exudate obtained from *Thuja articulata* and *Juniperus communis* grown in warm climates. It is used in making spirit varnish for photographic plates, etc., and in the form of powder for pounce bags, etc.

Gums.

Under this commercial title are included a great number of substances which are pharmaceutically classed under other headings. In pharmacy the substances classed as gums are natural exudates from trees or plants, which are soluble, or partly soluble, in water, and not in Alcohol, Ether, or Oils, Acacia or Gum Arabic being the most perfect type of this kind.

Acacia and Tragacanth, which are official, are the only true gums. The remainder, which are thus classed commercially, consisting of balsams, oleo-resins, turpentine, resins, gum-resins, stearoptens (camphor), and inspissated or concrete juices (as aloes and opium), and extracts (as catechu).

2803.

Acacia.

Gum Arabic.

This is a natural exudate, obtained from various species of *Acacia*, found in Arabia, Morocco, Turkey, Africa and the East Indies, the product generally bearing the name of the country or locality from which it is obtained — as Gum Arabic from Arabia, Barbary or Morocco Gum from Morocco, Gum Senegal from the settlements on the Senegal River, and East India Gum from Bombay. They are all furnished commercially as Gum Arabic of different qualities, the best being known as Extra, Select, White, and the inferior qualities as 1st, 2d, 3d, 4th, 5th, Select and Sorts.

Acacia consists chiefly of *Arabic Acid* or *Arabin*, combined with lime, potassium, or magnesium.

Uses.— It dissolves in water forming mucilage, and is used for making Syrup Acacia, and in making troches, pills, powders, etc. In medicine it is used as a demulcent.

Gum Senegal is a species of Acacia extensively used in the arts.

2804.

Tragacantha.*Tragacanth or Gum Tragacanth.*

This is a gummy exudate from several varieties of *Astragalus*, found in western Asia. It contains about 33 per cent. of *Bussorin*, an insoluble gum, and 53 per cent. of a soluble gum peculiar to it.

Uses.—Tragacanth absorbs water and forms a gelatinous mass or paste, which is used as a mucilage. It is used in the form of a powder to give adhesive properties to lozenges, troches, etc., also to make bandoline and hair fixers.

Besides these gums, which are official, a few others are known and sometimes used, as *Cherry-tree Gum*, which is mostly insoluble, *Hog Gum* from *Rhus Metopium*, *Mesquit Gum* from *Algarobia Glandulosa*, etc.

The following substances are classed commercially with Gums, but are known in pharmacy by the names they bear:

2805. Aloes.—The inspissated juice of the leaves of several varieties of *Aloes* found in Africa. Socotrine Aloes only is official in the U. S. The Br. P. recognizes Socotrine and Barbadoes Aloes. See page 135. It is commonly known as Gum Aloes.

2806. Camphor — *Gum Camphor* — $C_{10}H_{16}O$.—Although Camphor is a stearopten — an oxygenated turpene — possessing none of the properties of gums or gum-resins, and does not properly belong in this department, it is commercially classed with gums, and is familiarly known as “Camphor Gum.” It is obtained by subliming the crude Camphor, imported from China and Japan, from *Cinnamomum Camphora*, in shallow iron vessels, the sublimed Camphor collecting on the covers of the vessels.

Uses.—Camphor is one of the most familiar household remedies, “Spirits of Camphor” being used for everything. In pharmacy it is much used in making liniments, ointments, and other external applications and also an ingredient of many preparations given internally. It is a stimulant and may be given in doses of 2 to 10 grains. It is sold extensively to pack with furs to prevent moths, etc.

Monobromated Camphor — $C_{10}H_{15}BrO$.—This is prepared by the reaction of Bromine upon Camphor, and subsequent separation of the crystalline mass, and purification. It is given as a nervous sedative in doses of 2 to 5 grains.

2807. Catechu.—An extract prepared from the wood of *Acacia Catechu*, containing Catechu-tannic Acid, *Catechin* and *Catechol*. It is known commercially as Gum Catechu, Gum Cutch, Terra Japonica, etc. It is extensively used for dyeing and tanning, and in medicine as an astringent and tonic, the dose being from 5 to 20 grains.

2808. Kino — *Gum Kino*.—The inspissated juice of *Pterocarpus Marsupium*, found in the East Indies, and containing several astringent principles.

It is used in pharmacy for making Tincture of Kino, and in medicine is employed as an astringent and tonic, in doses of 5 to 20 grains.

2809. Opium — Gum Opium.— The concrete milky exudation from *Papaver Somniferum*. Although classed commercially with the gums it has none of their characteristics. See 2433.

Gum-Resins.

Gum-Resins, as understood in pharmacy, are natural exudates from trees or plants, consisting of gum, a portion soluble in water, and Resin, soluble in alcohol, therefore possessing the properties of both Gum and Resin. They are all classed commercially and familiarly known as Gums.

The following are official in the U. S. and Br. pharmacopœias, under the titles given :

2810. Ammoniacum.

Ammoniac or Gum Ammoniac.

A Gum-Resin obtained from *Dorema Ammoniacum*, containing about 25 per cent. of Gum, 70 per cent. of Resin, and 3 per cent. of volatile oil. It forms an emulsion when rubbed with water, and is somewhat employed as an expectorant and stimulant. It is also given in powders. The dose is 5 to 15 grains.

2811. Resorcin.— $C_6H_6O_2$ — Ammoniac is exhausted with alcohol, and the alcohol distilled until an extract only remains; this is carefully fused with three times its weight of caustic potassa; the mass is then dissolved in water and slightly acidulated with sulphuric acid, the solution filtered and agitated with ether. The ethereal portion is then separated and distilled or evaporated, leaving impure Resorcin as a residue, which is purified by dissolving in ether, distilling and crystallizing.

Resorcin is used as an antiseptic in fevers, cholera, etc., in doses of 5 to 10 grains.

2812. Asafœtida.

Asafetida or Gum Fetida.

A Gum-Resin obtained from the root of *Ferula Narthax* and other species of *Ferula*, containing about 20 per cent. of Gum and about 70 per cent. of Resin and a volatile oil. A portion is soluble in water, but the valuable portion is soluble in alcohol. It forms an emulsion when rubbed with water. It is employed as an antispasmodic in doses of 3 to 10 grains, and is given in the form of tincture and syrup for worms. Owing to its disagreeable odor it is usually given in the form of pills.

2813.

Cambogia.*Gambogia, Gum Gamboge.*

A Gum-Resin obtained from *Garcinia Hanburii*, containing about 20 per cent. of Gum and 75 per cent. of Resin, called *Gambogic Acid*. It is a powerful hydrogogue cathartic, and is mostly used in combination with other substances in cathartic pills. The dose is $\frac{1}{2}$ to 3 grains. It is also used as a pigment, making with water a glossy golden color.

2814.

Galbanum.*Gum Galbanum.*

A Gum-Resin obtained from *Ferula Galbaniflua*, containing 20 per cent. of gum, 65 per cent. of resin, and about 8 per cent. of volatile oil. It is a valuable ingredient of plasters and is used in pills. Its resin, extracted with alcohol, yields resorcin by the same treatment as is employed with ammoniac, and by dry distillation *Umbelliferone*, $C_9H_6O_3$, which is the principal in gums, giving a blue color when dissolved with water and a little ammonia added. Galbanum is employed internally as an antispasmodic, in doses of 5 to 15 grains.

2815.

Myrrha.*Myrrh — Gum Myrrh.*

A Gum-Resin obtained from *Balsamodendron Myrrha*, containing about 30 per cent. of gum, 60 per cent. of resin, about 3 per cent. of a volatile oil, and a bitter principle.

Myrrh is used in making several official preparations and employed in medicine as a stimulant and tonic. The dose is 5 to 20 grains.

2816.

Scammonium.*Scammony.*

A dried exudation from the root of *Convolvulus Scammonium*, containing gum and resin. The best varieties are called *Virgin Scammony*. It is used for making Resin of Scammony and in medicine as a purgative.

Other Gum-Resins.

Several other Gum-resins besides the foregoing official ones are used in pharmacy and medicine. The more important are as follows:

2817. Bdellium—*Gum Bdellium*.—A substance resembling Myrrh, obtained from Africa and the East Indies. It is used as a stimulant and expectorant.

2818. Euphorbium.—A substance containing about 18 per cent. of gum and 38 per cent. of resin, obtained from *Euphorbium resinifera* found in Morocco. It is used in irritating plasters, especially in veterinary practice, and in catarrh snuffs, etc.

2819. Olibanum — *Gum Olibanum or Frankincense*.— A Gum-Resin obtained from several species of *Boswellia*. It resembles Myrrh and is burned as incense. It contains 30 to 36 per cent. of gum and about 56 per cent. of resin, with a little volatile oil and insoluble gum (bassorin). It is used in making plasters and some other preparations.

2820. Opoponax — *Gum Opoponax*.— A Gum-Resin obtained from the roots of *Opoponax Chironium*, and containing gum, volatile oil, and resin. It is sometimes used as a stimulant and in plasters.

2821. Sagepenum — *Gum Sagepenum*.— A Gum-Resin obtained from some species of *Ferula*, somewhat resembling Asafetida and Galbanum. Factitious Gum Sagepenum is made by melting 3 parts Asafetida with 15 parts Galbanum and adding 1 part Oil of Turpentine. Its uses are similar to Galbanum.

2822. Spruce Gum.—A Gum-Resin obtained from the black spruce, *Abies Nigra*, found in the elevated regions of New England and in Canada. This gum is highly esteemed as a chewing gum, the pure gum having a fine flavor, but, as it is not abundant, most of the gum sold as Spruce Gum consists mainly of Burgundy Pitch.

An alcoholic Tincture of Pure Spruce Gum is used as a pectoral, and may be made into a syrup the same as Tolu.

2823. Tamarac Gum.— This is a Gum-Resin exuding from the tamarac or hackmatack tree, *Larix Americana*. It is not very abundant. It is used in the form of tincture as a pectoral, and the gum is chewed for the same purpose.

Many other exudates which are known commercially as Gums will be found under other headings, as Benzoin, Liquidamber or Sweet Gum under BALSAMS, Elemi, Gum Thus or White Pine Gum, etc., under OLEO-RESINS, etc.

2824. Chewing Gums.

The practice of Gum chewing has recently developed to quite an extent among all classes, and enterprising manufacturers advertise the superior qualities of their Gums with great vigor. They can only be mentioned in this connection, their formulas being given in another department.

The Chewing Gums sold as "Spruce Gum" are mainly composed of Burgundy Pitch. The white Gums under various titles as "Mastic," "Tolu," "Rosebud," etc., are soft Paraffin, some of them being mixed with sugar, fruits, etc. "Rubber Gum" is made from Rubber mixed with some other Gums. The Taffy and Caramel Gums are made with mixed Gums and Sugar or Caramel, etc. The Black Gums contain Black Pitch, etc. In fact, so great is the variety of Chewing Gums found in the market that it is next to impossible to enumerate them.

RESINOIDS OR CONCENTRATIONS.

. Eclectic Extracts, Powders, or Active Principles.

A class of preparations first introduced by the Eclectics and known as concentrated medicines or resinoids, of which Resin of Podophyllum ("Podophyllin") may be taken as a type, are considerably used, many of them possessing great merit as representing the principles of the drugs from which they are derived in concentrated form. These preparations are generally precipitated alcoholic extracts of the drugs, some being resins, some oleo-resins, and others mixed principles, which may or may not represent the true active medicinal value of the drug, depending upon its solubility in alcohol. They must not, therefore, be confounded with true active principles of definite chemical composition bearing the same names, as they are sometimes widely different.

2825. General Formula for Resinoids or Concentrations.

Take of the required drug in moderately fine powder any convenient quantity and Alcohol sufficient. Exhaust the drug by water-bath percolation with the alcoholic menstruum and concentrate the percolate by distillation until it is reduced to the consistence of a thin syrup, which pour gradually and with constant stirring into a sufficient quantity of cold Water. After standing, collect the precipitate, wash it with a little cold water, spread it upon plates and carefully dry it by means of a current of warm air, or in the case of Oleo-resins, or very soft extracts which are precipitated, mix them with a sufficient quantity of the powdered drug from which they were derived, to make them into the form of powder.

The consistence of the residue after concentration by distillation or evaporation depends much upon the constituents of the drug, but as a rule the liquid should be no more than one fourth the quantity of the powdered drug which was taken. And the quantity of cold Water into which it is poured should be from 10 to 30 times as much as of the concentrated liquid. Some extracts deposit tarry matter, which is undesirable, and

should be removed by allowing them to stand and decanting the clear solution before adding to Water. Alum is sometimes added to the Water to facilitate the precipitation.

Asclepidin, Cypripedin, Ptelein, Senecin, Xanthoxylin and some other preparations are mostly Oleo-resins, and must be mixed with the powdered substances in order to make them into a powder. Some, like Leptandrin and Ergotin, are soft resinous substances and are much improved by the addition of a portion of the powdered substance.

The following list embraces most of the Concentrations or Resinoids which are used, although it is obvious that many others may be made. They may be prepared as directed by the foregoing General Formula:

ECLECTIC CONCENTRATIONS OR RESINOIDS.

No.	NAME.	PREPARED FROM.	PART USED.	DOSE.
2826	Aconitin	Aconitum Napellus	Root.	$\frac{3}{16}$ to $\frac{3}{8}$ grain.
2827	Aletin.	Aletris Farinosa	Root.	2 to 5 grains.
2828	Alunin	Aluns Rubra	Bark.	1 to 3 grains.
2829	Ampelopsin	Ampelopsis Quinquefolia	Bark.	2 to 8 grains.
2830	Apocynin	Apocynum Androsæmifolium	Root.	$\frac{1}{2}$ to 2 grains.
2831	Asclepin	Asclepias Tuberosa	Root.	1 to 5 grains.
2832	Atropin	Atropa Belladonna	Root or leaves	$\frac{1}{16}$ to $\frac{1}{10}$ grain.
2833	Baptisin	Baptisia Tinctoria	Root.	$\frac{1}{4}$ to 1 grain.
2834	Barosmin	Barosma Betulina	Leaves	1 to 4 grains.
2835	Betin	Beta Vulgaris	Root.	2 to 5 grains.
2836	Caulophyllin	Caulophyllum, thalictroides	Root.	$\frac{1}{4}$ to 1 grain.
2837	Ceanothin	Ceanothus Americana	Root.	2 to 5 grains.
2838	Cerasein	Cerasus Virginiana	Bark.	5 to 10 grains.
2839	Chelonin	Chelona Glabra	Herb.	1 to 2 grains.
2840	Chimaphilin	Chimaphila Umbellata	Leaves	1 to 4 grains.
2841	Chionanthin	Chionanthus Virginiana	Bark.	1 to 3 grains.
2842	Cimicifugin	Cimicifuga Racinosa	Rhizome	1 to 5 grains.
2843	Collinsonin	Collinsonia Canadensis	Herb.	1 to 3 grains.
2844	Colocynthin	Cucumis Colocynthis	Fruit Pulp.	$\frac{1}{2}$ to 2 grains.
2845	Cornin	Cornus Florida	Root bark.	3 to 5 grains.
2846	Corydalin	Dicentra Canadensis	Tubers.	$\frac{1}{2}$ to 2 grains.
2847	Cypripedin	Cypripedium Pubescens	Rhizome	1 to 2 grains.
2848	Digitalin	Digitalis Purpurea	Leaves	$\frac{1}{4}$ to 1 grain.
2849	Dioscorin	Dioscorea Villosa	Root.	2 to 5 grains.
2850	Ergotin	Ergota, Claviceps purpurea	Fungus	$\frac{1}{16}$ to $\frac{1}{4}$ grain.
2851	Erythroxylin	Erythroxylin Coca	Leaves	1 to 3 grains.
2852	Euonymin	Euonymus Atropurpureus	Bark.	$\frac{1}{4}$ to 4 grains.
2853	Eupatorin	Eupatorium Perfoliatum	Leaves and tops	2 to 4 grains.
2854	Euphorbin	Euphorbia Corollata	Root.	$\frac{1}{2}$ to 2 grains.
2855	Eupurpurin	Eupatorium Purpureum	Root.	1 to 3 grains.
2856	Frazerin	Fraseria Walteri	Root.	1 to 5 grains.
2857	Gelsemin	Gelsemium Sempervirens	Rhizome	$\frac{1}{2}$ to 2 grains.
2858	Geraniin	Geranium Maculatum	Root.	1 to 3 grains.
2859	Gossypin	Gossypium Herbaceum	Root bark	1 to 5 grains.
2860	Hamamelidin	Hamamelidis Virginica	Root.	3 to 5 grains.
2861	Helonin	Helonias Dioica	Root.	$\frac{1}{2}$ to 2 grains.
2862	Hydrastin	Hydrastis Canadensis	Rhizome	2 to 5 grains.
2863	Hyoscyamin	Hyoscyamus Niger	Leaves	$\frac{1}{12}$ to 2 grains.

ECLECTIC CONCENTRATIONS OR RESINOIDS—Continued.

No.	NAME.	PREPARED FROM.	PART USED.	DOSE.
2864	Inulin	Inula Helenium	Root.	1 to 3 grains.
2865	Irisin or Iridin ...	Iris Versicolor.	Root.	$\frac{1}{2}$ to 2 grains.
2866	Jalapin	Ipomœa Jalapa.	Tuber.	$\frac{1}{2}$ to 2 grains.
2867	Juglandin.	Juglans Cinerea.	Root bark.	2 to 5 grains.
2868	Leontodin.	Leontodon Taraxacum.	Root.	2 to 5 grains.
2869	Leptandrin.	Leptandra Virginica.	Root.	2 to 4 grains.
2870	Lobelin.	Lobelia Inflata.	Herb.	$\frac{1}{6}$ to $\frac{1}{4}$ grain.
2871	Lupulin.	Humulus Lupulus.	Strobiles.	1 to 3 grains.
2872	Lycopin	Lycopus Virginicus.	Plant.	1 to 3 grains.
2873	Macrotin.	Cimicifuga Racemosa.	Rhizome.	1 to 5 grains.
2874	Menispermin	Menispermum Canadense	Root.	1 to 2 grains.
2875	Myricin	Myrica Cerifera.	Bark.	1 to 5 grains.
2876	Phytolaccin	Phitolacca Decandra.	Rhizome.	$\frac{1}{4}$ to 1 grain.
2877	Podophyllin.	Podophyllum Peltatum.	Root.	$\frac{1}{8}$ to 1 grain.
2878	Populin.	Populus Tremuloides.	Bark.	2 to 5 grains.
2879	Prunin	Prunus Virginiana.	Root bark.	1 to 3 grains.
2880	Ptelein.	Ptelea Trifoliata.	Bark.	1 to 3 grains.
2881	Rhein.	Rheum Palmatum.	Root.	2 to 4 grains.
2882	Rhusin.	Rhus Glabra.	Root bark.	1 to 3 grains.
2883	Rumin.	Rumex Crispus.	Root.	1 to 2 grains.
2884	Sanguinarin.	Sanguinaria Canadensis.	Rhizome.	$\frac{1}{2}$ to 2 grains.
2885	Scutellarin.	Scutellaria Laterifolia.	Herb.	3 to 5 grains.
2886	Senec'in.	Senecio Gracilis.	Plant.	1 to 3 grains.
2887	Smilacin.	Smilax Sarsaparilla.	Root.	2 to 5 grains.
2888	Stillingin.	Stillingia Sylvatica.	Root.	$\frac{1}{2}$ to 1 grain.
2889	Trillin.	Trillium Pendulum.	Root.	3 to 5 grains.
2890	Veratrin.	Veratrum Viride.	Rhizome.	$\frac{1}{4}$ to $\frac{1}{2}$ grain.
2891	Viburnin.	Viburnum Opulus.	Bark.	1 to 2 grains.
2892	Xanthoxylin.	Xanthoxylum Fraxineum.	Bark.	$\frac{1}{4}$ to 1 grain.

SACCHARA—SUGARS.

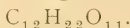
Sugars are substances composed of carbon, hydrogen and oxygen, of a sweet taste, crystallizable, and mostly of a vegetable origin. The most important sugars, are Saccharose, the ordinary Sugar of commerce, prepared from sugar-cane, sorghum, etc., and glucose, which has already been described (page 515).

The glucoses have the composition $C_6H_{12}O_6$, and are directly subject to vinous fermentation. The saccharoses have the composition $C_{12}H_{22}O_{11}$, and are fermentable only after being converted into a Sugar of the glucose class.

There are also a number of non-fermentable Sugars termed *saccharoids*, some of them having the same composition as glucose, and others varying somewhat.

Among other products that are derived from the decomposition of Saccharine fluids, Alcohol, Acetic Acid and Oxalic Acid may be mentioned as most valuable.

2894.

Saccharum.*Sugar.*

The greater part of the Sugar found in the market is prepared from the expressed juice of the Sugar-cane, grown in the Southern States, the West Indies, and Central America. The Sugar-cane is crushed in mills, and the juice, which is about 80 per cent. of the whole, is expressed, a little lime and bisulphite of calcium added, then strained and evaporated to a thick syrup, which is placed in casks, allowed to crystallize and drained. In the larger manufacturing establishments the process employed is somewhat different, the vacuum pan being used instead of open evaporation, and the draining being accomplished by "centrifugals," which by rapid motion separate the fluid from the solid portions. The process for making Sugar from Sorghum is the same, and Beet-Root Sugar is made in a similar manner, but is not so readily purified.

The crude or "raw" sugars prepared as described are purified and decolorized by filtering their solutions through powdered animal charcoal, or bone-black. When allowed to crystallize from the solution thus purified the crystals obtained are called Rock Candy, but if evaporated to a solid mass with continual agitation, it is granulated.

Granulated Sugar, on account of its purity and convenience, is generally chosen for making syrups and liquid preparations, and powdered Sugar for making troches, powders, triturations, etc. Cane-sugar is often adulterated or mixed with Grape Sugar, which may be discovered by Trommer's test, which is as follows:

Trommer's Test.—To a solution of the sugar or saccharine liquid desired to be tested, add a little solution of sulphate of copper, and then solution of potassa in excess; heat the mixture to boiling. When cool, if the saccharine solution contained only saccharose or cane-sugar, there will be but a small deposit of red powder; but if it contained grape-sugar or glucose, there will be a copious greenish precipitate, which changes to scarlet and afterward to a dark brownish-red.

Saccharine Substances.

The following substances, having similar composition and characteristics, are known as Saccharine substances :

Saccharoses.



Cane-Sugar (Saccharose).—From sugar-cane, beets, and sorghum.

Parasaccharose.—Produced by spontaneous fermentation of cane-sugar.

Milk Sugar (Lactose, Lactin).—Obtained from milk. (See page 542.)

Mycose.—Obtained from ergot, identical with trehalose.

Melezitose.—Obtained from manna found in Tasmania and Persia.

Melitose.—Obtained from various species of eucalyptus.

Trehalose.—Obtained from cocoons of *Larinus Maculatus*.

Glucoses.



Glucose (Dextrose or Dextro-Glucose).—From starch, etc. (See page 515.) Rotates the plane of polarization strongly to the right.

Grape-Sugar.—By crystallizing glucose. (See page 515.)

Lævulose (Lævo-Glucose).—From sugar-cane and molasses. Rotates plane of polarization to the left.

Maltose (Barley-Sugar).—By the action of diastase on starch.

Dulcitol.—By oxidizing dulcit with nitric acid.

Mannitose.—Found in muscular flesh.

Galactose.—By treating sugar of milk with dilute sulphuric acid.

The following are the *non-fermentable* saccharine substances :

Mannit— $\text{C}_6\text{H}_{14}\text{O}_6$.—From manna and other similar substances.

Dulcit— $\text{C}_6\text{H}_{14}\text{O}_6$.—From *melampyrum nemorosum*.

Eucalyn— $\text{C}_6\text{H}_{12}\text{O}_6$.—From the fermentation of melitose.

Inosit $\text{C}_6\text{H}_{12}\text{O}_6$.—From muscular flesh.

Quercitrose— $\text{C}_6\text{H}_{12}\text{O}_6$.—From quercitrine.

Sorbit— $\text{C}_6\text{H}_{12}\text{O}_6$.—From mountain ash berries.

Erythromannit— $\text{C}_{12}\text{H}_{30}\text{O}_{12}$.—From *protococcus vulgaris*.

Isodulcit— $\text{C}_6\text{H}_{14}\text{O}_6$.—From quercitrine.

Pinit— $\text{C}_6\text{H}_{12}\text{O}_6$.—From *pinus lambertiana*.

Quercit— $\text{C}_6\text{H}_{12}\text{O}_6$.—From acorns.

2895. Saccharates are prepared by saturating sugar with tinctures, drying it, then powdering. Homœopathic pellets are prepared in a similar manner, by saturating them with a tincture strongly alcoholic and allowing them to dry.

2896. Oleo-Saccharures—*Elæo-Sacchara*—are prepared by rubbing 1 drop of any volatile oil with 30 grains of powdered sugar until they are thoroughly mixed.

2897. Saccharine.—This is a new substance prepared by a complicated process from Toluene, by treating with acids and ammonia. Its every-day

chemical name is Benzoyl-Sulphonic-Imide, but when it is on dress-parade it is known as Anhydroorthosulpaminbenzoic Acid, its composition being $C_6H_4COSO_2NH$. It is said to be about three hundred times sweeter than sugar, and to possess wonderful antiseptic properties. Its uses have not yet been well defined, but it is predicted to be of great value in sweetening preparations which with sugar would be liable to ferment, as fruit juices, etc.

2898. SALICINUM — SALICIN.



A neutral principle prepared from the bark of *Salix* of different species, by treating a boiling concentrated decoction of the bark with Oxide of Lead until it becomes nearly colorless, the lead combining with the gum tannin and extractive matter, which is removed by filtration. The filtered liquid is then treated with Sulphuric Acid to convert the dissolved Oxide of Lead into a sulphate, and then with Sulphide of Barium to remove sulphates, etc. The liquor is then filtered, evaporated, and crystallized, Salicin being obtained,

Salicin is a Glucoside, which yields *Saligenin* and Sugar when heated with dilute acids.

Uses.— It is used as a febrifuge and tonic in doses of 5 to 30 grains. Some practitioners prefer it to quinine, especially in rheumatic fever.

SALICYL.



This is the hypothetical compound radical of the Salicyl series of compounds. It is not known as a free radical, but only in combination.

The volatile Oil of Meadow Sweet, *Spiræa Ulmaria*, is a natural hydride of Salicyl. Oil of Wintergreen and Oil of Birch are also compounds of Salicyl.

2899. Acidum Salicylicum—Salicylic Acid,— $HC_7H_5O_3$. The greater part of the Salicylic Acid found in the market is made according to the process of Kolbe, by treating Carbolate of Sodium with Carbon dioxide (Carbonic Acid gas); by this process it is made as follows: A highly concen-

trated solution of Caustic Soda is evaporated with a corresponding amount of Carbolic Acid to a dry powder. This is then heated in a retort to 100°C . (212°F .) and a current of dry carbon dioxide passed over it. The temperature is gradually increased to 180°C . (356°F .) and then to 220°C . (428°F .), at which temperature the free Phenol distills over. The temperature is then increased to 250°C . (482°F .) and continued until no more Phenol distills. Half of the Phenol used now remains in the retort as Salicylate of Sodium, the other half having been recovered by distillation as Phenol.

The Sodium Salicylate thus obtained is dissolved in water, decomposed by the addition of Hydrochloric Acid, the precipitate washed and crystallized from its solution in hot water, then drained and dried, making the Salicylic Acid of commerce, which may be termed *Pheno-Salicylic Acid*.

A Salicylic Acid in much larger crystals is also prepared from Oil of Wintergreen, but is too expensive for general use. It is known as *Gaulthero-Salicylic Acid*, and has the same chemical composition as that previously described. It forms with bases a class of Salts called *Salicylates*.

Uses.—Salicylic Acid is employed extensively as a preservative of non-alcoholic liquids, fruits, etc., and in medicine is used as a remedy for rheumatism, neuralgia, and septic diseases, and in large doses as an antipyretic. The dose is from 5 to 15 grains.

2900. Salicylous Acid — $\text{C}_7\text{H}_6\text{O}_2$ — *Salicylol*. This is an oily liquid, obtained from Volatile Oil of Meadow Sweet, which, when pure, consists entirely of it. It is also obtained from Salicin. It is not employed in medicine.

2901. Salol.—This new antiseptic and antipyretic is a phenyl ether of Salicylic Acid, its chemical formula being $\text{C}_6\text{H}_5\cdot\text{C}_7\text{H}_5\text{O}_3$. The process for making it is complicated, but it is claimed that it possesses the valuable medicinal properties of Salicylic Acid without its disagreeable effects. It is given for rheumatism, fevers, etc., in doses of 5 to 20 grains, with excellent results, and also applied as a dusting powder for eruptions, sores, etc.

2902. SANTONINUM — SANTONIN.



A neutral crystalline principle prepared from *Santonica*. A formula for its preparation is official in the Br. P., as follows:

Santonica, bruised,	1	pound av.
Slacked Lime,	7	ounces av.
Hydrochloric Acid, a sufficient quantity.		
Solution of Ammonia,	$\frac{1}{4}$	fl.ounce.
Rectified Spirit,	14	fl.ounces.
Purified Animal Charcoal,	60	grains.
Distilled Water, a sufficiency.		

The bruised "Worm Seed" is boiled first with 1 gallon (Imperial) of Water and 5 ounces of the Lime for an hour; the liquid is then strained off with pressure and the residue again boiled for half an hour with half a gallon (Imperial) of Water and 2 ounces of the lime, and the liquid strained with pressure as before and added to the portion previously obtained. The liquid is then allowed to settle, strained, and evaporated to 2½ pints (Imperial). To this, while hot, Hydrochloric Acid is added until the liquid is slightly acid and set aside for 5 days to precipitate. The liquid is then poured off from the precipitate, which is washed first with cold Water, then with the Solution of Ammonia diluted with 5 ounces of cold Water. It is then pressed, dried, and mixed with the Animal Charcoal, 9 fl.ounces of the Spirit added, and, after half an hour, the mixture boiled for 10 minutes. It is then filtered while hot and the residue in the filter washed with an ounce of boiling spirit and the liquid set aside to crystallize. The crystals are then collected, dissolved in 4 ounces of boiling Spirit and recrystallized. It should be protected from the light, which changes it yellow.

Uses.—Santonin is employed in medicine as an anthelmintic in doses of 1 or two grains. It is best given in the form of powder or suspended in syrup or emulsion, or in the form of troches. The worm confections and lozenges which are popular contain Santonin.

SAPOES — SOAPS.

Soaps are compounds of fatty acids with alkalies, and are prepared by mixing fats or oils with a caustic alkali in solution, and either boiling until a thick mass is formed or combining cold, and allowing to stand until the combination is effected. The use of Soaps in the arts and industries is well known. In pharmacy and medicine they are considerably employed.

Soaps are naturally divided into *hard soaps*, which are made with soda alkali, and *soft soaps*, which are made with Potassa alkali. As different fats vary in proportion of their fatty acids, and the caustic soda and potassa of commerce vary in caustic

strength, definite formulas for the Soap bases cannot well be given, but the following general formulas and processes given by W. J. Menzies in the *Manufacturers' Review* for November 15, 1880, will be satisfactory. The first can be used either for making Castile Soap or Curd Soap :

2903. General Formula for Hard Soaps.

Take exactly 20 pounds of Greenbank double refined 98 per cent. powdered caustic soda; put it into any suitable iron or metal vessel with 90 pounds of soft water, stir it once or twice with a stirrer; it will dissolve immediately and become quite hot; let it stand until the lye thus made is cold. Weigh out and place in any convenient vessel for mixing and melting exactly 145 pounds of clean tallow, grease or oil (where oil is used no heating is required). Melt it slowly either with steam or fire until it is liquid and feels warm to the hand — that is to say, not exceeding 100° F. Pour the lye slowly into the melted tallow in a small stream continuously, at the same time stirring with a flat wooden stirrer about three inches broad; continue gently stirring until the lye and melted tallow or oil are thoroughly combined and the mixture appears like honey. Do not stir too long, or the mixture is liable to separate again. The time required varies somewhat with the weather and kind of tallow, grease or oil used, from fifteen to twenty minutes will be quite enough. When the mixture is complete, pour it off into an ordinary soap frame; or this may be dispensed with, and an old square wooden box may be used for a mould, previously damping the sides with white wash or water so as to prevent the soap sticking. Put the frame or box in a warm place until the next day, covering it up well with blankets; it will then be found to contain about 255 pounds of fine white hard soap, which can be cut up with a wire into bars for the convenience of weighing, etc. Remember the chief points in the above directions, which must be exactly followed. The lye must be allowed to cool. The heated tallow or grease used must not be over a temperature of about 100° F. The lye must be thoroughly stirred into the melted tallow, *not* tallow or oil into the lye. The exact weights of Double Refined Powdered 98 per cent. Caustic Soda and tallow, grease or oil must be taken. If the tallow or grease is not clean or contains any salt, it must be "rendered" or purified previous to use, that is to say, boiled with water and allowed to cool, as any salt present spoils the whole operation entirely. Discolored or rancid grease or tallow, however, is just as good for common soap-making purposes. If the soap turns out streaky and uneven, it has not been thoroughly mixed. If very sharp to the taste, too much caustic soda has been used. If soft, mild and greasy, too much tallow or oil has been taken. In either case it should now be thrown into a kettle with about six gallons of water and cut up into shavings or very small pieces. In the first case boiling is all that is necessary — in the other instances a very little more oil or a very little more of the Double Refined 98

per cent. Caustic Soda must be added to the water previous to boiling. None of these things will happen, however, if the above directions are exactly followed, and with the experience gained after making a few batches of soap the whole process is an exceedingly easy one.

2904. General Formula for Soft Soap.

Take 50 pounds of Greenbank pure caustic potash; put it in any iron or earthenware vessel with 90 pounds of water. Stir it once or twice; it will dissolve immediately and become quite hot. Let it stand until the lye thus made is cold. Place in any convenient vessel for mixing 185 pounds of cottonseed oil and 20 pounds of clean melted tallow. Pour the lye into the oil in a small stream, at the same time stirring with a flat wooden stirrer about three inches broad. Continue gently stirring until the lye and oil are thoroughly combined, and in appearance like honey. Now cover the vessel up and put it in a warm place until the next day. The oil and lye will then be found nearly all combined. Stir up well again and leave for a few days, when the mixture will become quite even and the saponification complete; the result being the production of about 345 pounds of very stiff potash soap, costing for materials about $3\frac{3}{4}$ cents per pound. If made for use by an actual consumer nothing more need be done; the requisite quantity can be thrown into the scouring vat, either with or without the addition of a small quantity of carbonate potash to increase the alkali present, and depending upon the purpose for which the soap is used.

The potash soap produced in this way is very much more concentrated than the ordinary "fig" soap hitherto sold. If it is desired to make an ordinary soft soap it can be produced in the following manner: Take 200 pounds of the stiff potash soap and add to it about 70 pounds of water. Put it into a boiling pan and gently heat and stir it so as to mix well together; at the same time adding about eight pounds of crystalline carbonate of potash, which will remove all "stringyness" and produce a clear homogeneous soap. It will improve in appearance by keeping for a short time.

The above "cold process" is simple and effective, and even a few pounds alone of soft soap can be made by it. With mechanical mixing apparatus and large pans, soft soap can easily be produced on a large scale by this process.

The following are the Soaps of the U. S., Br. and German Pharmacopœias:

2905. Sapo. U. S.

White Castile Soap.

Soap prepared from Soda and Olive Oil. In Br. pharmacy this is known as *Sapo Duris*, or Hard Soap; in German pharmacy it is known as *Sapo Oleaceus*; but in commerce it is known only as *Castile Soap*.

The common varieties made from inferior oil and *mottled* by the addition of an iron salt are extensively sold as ordinary Castile Soap, but in medicine and in pharmacy only that made with fine Olive Oil and pure Soda should be used. It is employed for making oleates, liniments and pills, and is extensively used mixed with other kinds of Soap for making perfumed and toilet soaps.

2906.

Sapo Animalis. Br.*Curd Soap.*

A Soap made with Soda and purified animal fat, consisting principally of stearin. This is a nearly neutral White Soap, generally made with fine tallow and pure soda alkali or caustic soda. It is known as *Tallow Soap*, and used as the basis of most of the perfumed toilet Soaps. In pharmacy it is used in making several plasters, liniments, pills, and suppositories.

For making fine Toilet Soaps, Curd Soap is reduced to shavings by passing over a plane and then, being moistened, it is combined with the perfuming oils desired, by working them well in with it in a mortar, until the mass is of uniform consistence without streaks. For larger manufacturing the Soap is *milled* with the oils, and then pressed into cakes. If desired to be colored the coloring matter is well worked in.

2907.

Sapo Jalapinus. G. P.*Jalap Soap.*

The G. P. gives the following formula for Jalap Soap or *Jalapenseife* :

Resin of Jalap,	4 parts.
Medicinal Soap,	4 parts.
Diluted Alcohol,	8 parts.

Dissolve the Resin of Jalap and Medicinal Soap in the Diluted Alcohol, and evaporate on a steam-bath, stirring constantly, to 9 parts.

2908.

Sapo Mollis. Br.*Soft Soap.*

Made with Potash and Olive Oil. In Br. pharmacy it is used in making turpentine liniment. It is of a gelatinous consistence, and is soluble in rectified spirit.

The *Sapo Kalinus* of the G. P., which is known as *Potassa Soap* or *Soft Soap*, is made by adding to solution of Potassa, G. P., 135 parts, heated on a steam-bath, Linseed Oil 100 parts, stirring constantly, and continuing the heat for half an hour; then adding Alcohol, 25 parts, stirring, and gradually adding Water, 200 parts, and heating until a transparent viscid soap is formed, and continuing the heat until the Alcohol is evaporated, and the finished product weighs 150 parts. This is a soft lubricous mass, and differs from the Soft Soap of the Br. P. in being transparent.

2909. Sapo Medicatus. G. P.*Medicinal Soap.*

The German Pharmacopœia directs :

Solution of Soda, G. P.,	120 parts.
Lard,	50 parts.
Olive Oil,	50 parts.
Alcohol,	12 parts.
Water,	280 parts.
Chloride of Sodium,	25 parts.
Carbonate of Sodium,	3 parts.

Heat the solution of Soda by means of a steam-bath, and gradually add the Lard, previously melted, then the Olive Oil; stir and continue the heat for half an hour; then add the Alcohol, and then 200 parts of Water, gradually adding, if necessary, small portions of the solution of Soda until a transparent viscid Soap is formed; then add a filtered solution of the Chloride and Carbonate of Sodium in 80 parts of Water, and heat and stir until the Soap has wholly separated from the liquid. The separated Soap is afterward washed, expressed, and cut into cakes, and is used as a neutral Medicinal Soap.

2910. Sapo Viridis. U. S.*Green Soap.*

Soap prepared from Potassa and Fixed Oils. This is a Soft Soap, called in the G. P. *Sapo Kalinus Venalis*. It is prepared from various Oils, which contain but little stearin, by boiling with solution of Potassa.

It is used in pharmacy in making Tincture of Green Soap, and medicinally in skin diseases.

Other Soaps.

The foregoing are all the Soaps official in the leading pharmacopœias, but a large variety of other Soaps are used in pharmacy and the toilet, the more important medicinal soaps being here mentioned.

2911. Yellow Soap.—This is the common Laundry Soap, made from tallow, resin and lard, with Soda, the same as curd soap.

2912. Marine Soap, or Salt-Water Soap.—This is a Coconut Oil Soap, made with Soda, and containing an excess of alkali. It is used for washing in salt water and for making toilet soaps. It is known also as Coconut Soap.

2913. Palm Soap.—This is a yellow soap, made with Palm Oil and Soda, considerably used for mixing in making toilet soaps.

2914. Naples Soft Soap is made from Fish Oil mixed with Olive Oil with Potash alkali. *Fig Soft Soap* is made with Olive and other Oils and Potash.

2915. Whale Oil Soap is made with common Whale Oil and Potash. It is also called *Black Soap*, and is used chiefly for washing plants to remove insects.

The foregoing are used as bases and for combining to make other soaps. A few medicinal soaps have some sale and use, especially Carbolic, Sulphur, and Tar Soaps.

2916. Arsenical Soap.—Carbonate of Potassium 6 ounces, Arsenic, White Soap, each 2 ounces, Powdered Camphor 3 drachms, Water sufficient to make a stiff paste. This is used for preserving the skins of birds and small animals.

2917. Antimonial Soap.—Golden Sulphuret of Antimony 2 drachms, Solution of Caustic Potassium 6 drachms. Dissolve the salt in the solution, and mix thoroughly with Castile Soap, in powder, $1\frac{1}{4}$ ounce.

2918. Camphorated Soap.—This Soap is usually prepared by incorporating from 2 to 5 per cent. of Camphor with Curd Transparent Soap. The Camphor is dissolved in as little Alcohol as possible, and added to the melted Curd or Transparent Soap, the Alcohol evaporating and leaving the Camphor mixed with the Soap. It may also be mixed by melting powdered Camphor with Soap.

2919. Carbolic Soap.—This popular Soap may be made for toilet purposes by incorporating 2 to 3 per cent. of Carbolic Acid by melting with Curd or Castile Soap. For medicinal and surgical use it is usually made about 5 per cent. by incorporating with White Castile Soap. For veterinary use and as a wash for dogs and other animals to remove vermin, it is generally made with 10 per cent. of Crude Carbolic Acid, mixed with any kind of cheap hard soap.

2920. Chlorinated Soap.—Powdered Castile Soap 11 ounces, dry Chlorinated Lime 1 ounce. Mix them together and make into a mass with Alcohol, in which some perfume has been dissolved. This is used as a detergent and antiseptic in hospital practice.

2921. Cod Liver Oil Soap.—This may be made with Cod Liver Oil 2 ounces, Caustic Soda 2 drachms, Water 5 fl.drachms. 1 drachm of Iodide of Potassium may be added to this; making a valuable Soap for scrofulous and syphilitic sores. It is also given internally.

2922. Croton Oil Soap.—Croton Oil and Solution of Potassa, equal parts, triturated together in a warm mortar until they combine. This is given as a cathartic, in doses of 1 to 3 grains, and is much less irritating than the oil taken alone.

2923. Glycerin Soap.—For medicinal use any good toilet, transparent, or Curd Soap may be made by melting with a very little water, and mixing

thoroughly with from 3 to 5 per cent. of Glycerin. It may be perfumed as desired. The following formula may be used if desired to make the Soap from crude materials: 40 pounds of Tallow, 40 pounds of Lard, and 20 pounds of Coconut Oil are saponified with 45 pounds of Soda Lye and 5 pounds of Potash Lye of 40° Baumé; to the saponified mass 6 pounds of Glycerin, $\frac{1}{2}$ ounce Oil of Portugal, $\frac{1}{3}$ ounce Oil of Bergamot, 5 ounces Oil of Bitter Almond, and 3 ounces Oil of Vitivert are added.

2924. Iodine Soap.— This may be made by melting Castile Soap, 1 pound, and adding while melted 1 ounce of Iodide of Potassium, dissolved in 3 ounces of Water. It is used for scrofulous and syphilitic sores.

2925. Juniper Tar Soap.— This Soap may be prepared by saponifying Juniper Tar 1 part, mixed with Tallow 4 parts, with a solution of Caustic Soda, in the same manner as is directed for making Curd Soap. Other Tar Soaps may be made in the same general manner, care being used not to have them contain an excess of alkali. The Tar Soaps are highly esteemed in skin diseases.

2926. Mercurial Soap.— This is made by saponifying Nitrate of Mercury Ointment with a solution of Caustic Soda. It is employed for some skin diseases.

White Precipitate Soap may be made by incorporating 1 drachm of White Precipitate with 6 ounces of Curd or other White Soap.

Red Precipitate Soap may be made with double the quantity of Red Precipitate, as directed above.

Corrosive Sublimate Soap may be prepared with Castile Soap, in powder, 4 ounces, Corrosive Sublimate, in fine powder, 60 grains, Alcohol 1 fl.ounce, all well beaten together.

2927. Sulphur Soap.— This Soap may be prepared by incorporating 5 per cent. of Precipitated Sulphur (see Sulphur) with Curd Soap while making.

Alum-Sulphur Soap may be made by using 1 per cent. of Alum and 5 per cent. of Sulphur in the same manner. Sulphur Soap is a popular remedy for skin diseases.

2928. Transparent Soap.— By cutting dry Curd, Castile or other varieties of Soap in fine shavings, and dissolving in an equal weight, or as little as possible, of Alcohol, and after standing for some time until all is dissolved that will, then pouring off the clear portion and casting in moulds, and drying. No more spirit than is necessary should be used. It may be perfumed as desired.

2929. Turpentine Soap.— This may be made by mixing Carbonate of Potassium, Oil of Turpentine and Venice Turpentine, equal parts, in a warm mortar, adding a little water until they are combined. This is a stimulating soap for washing indolent ulcers, etc.

The foregoing Soaps include nearly all that are used to any extent medicinally. Other Soaps will be found among the toilet preparations.

SELENIUM.

Symbol, Se.; Atomic weight, 78.8.

Selenium is a rare elementary substance discovered in 1817, by Berzelius, in the refuse of the manufacture of sulphuric acid from pyrites of Fahlun in Sweden. Like sulphur it assumes three allotropic forms—amorphous, vitreous, and crystalline. It combines with oxygen and with hydrogen and some other elements, but its compounds are not used in pharmacy.

2930. Selenic Acid— H_2SeO_4 .—This is prepared by fusing Selenium with Nitrate of Potassium or Sodium, treating the fused mass with Water, precipitating the solution thus made with Nitrate of Lead, and then decomposing the precipitated Selenate of Lead with Sulphuretted Hydrogen, and separating the liquid, which is Selenic Acid, from the precipitate. This Acid unites with bases forming Selenates.

2931. Selenous Acid— H_2SeO_3 .—This may be made by heating the foregoing rapidly.

SILICON.

Symbol, Si; Atomic weight, 28.

Silicon is an element classed chemically with Carbon and Boron, and like them is found in three allotropic states—amorphous, crystalline, and graphitoid. It is found abundantly in nature combined with earths, and in the form of sand, flint, quartz, etc., as an anhydride (silica), which is its only oxide.

2932. Silica— SiO_2 .—This may be obtained most conveniently by decomposing the solution of Silicate of Sodium (1919) with Hydrochloric Acid, washing and drying the precipitate. It is a fine white powder, insoluble in all acids except hydrofluoric. It is an anhydride, but more frequently called *Silicic Acid*. It is soluble in strong alkali solutions by the aid of heat, forming salts called *Silicates*, as Silicate of Sodium, Silicate of Potassium, etc.

In the crystalline form Silica is found in agate, amethyst, calcedony, cornelian, onyx, etc., colored variously by admixture with other substances. In the form of sand and quartz, Silica is extensively employed in the manufacture of glass, being fused with soda ash or other alkali.

SODIUM OR NATRIUM.

Symbol, Na. ; Atomic weight, 23 ; sp. gr., 0.972.

Sodium is one of the Alkali metals, having the same general characteristics as potassium. It is silver-white, soft, fuses at 194° F., is volatilized at a red heat and oxidizes rapidly in contact with the air, having to be preserved in some hydro-carbon, as mineral naphtha. Thrown upon water it decomposes it with great violence but without flame, differing in this respect from potassium.

It is prepared in the same manner as potassium (which see), and is the basis of the Sodium salts, combining with all acids and negative elements to form them. The salts of Sodium are all white, crystallizable, readily soluble, and are of great importance in the arts and in medicine.

The following are the salts of Sodium official in the leading pharmacopoeias :

2933. Soda, U. S. Soda Caustica. Br.

Soda — Hydrate of Sodium — Caustic Soda.



Caustic Soda as it is termed in trade is an article of great commercial importance, and is extensively used in the arts and industries of the world. It is prepared of several degrees of strength for manufacturing purposes, being from 60 to 98 per cent. pure, and is furnished in drums or smaller packages, either in a solid mass, granulated, or in powder. For medicinal use it is usually prepared by evaporating the solution of Soda, and casting in sticks in the same manner as is directed for making Potassa (which see).

Uses.—Caustic Soda is extensively employed for making soap and many other articles of commercial importance. In pharmacy it is used for making Solution of Soda, and for other purposes. In medicine it is used as a caustic and given in solution greatly diluted.

2934. Soda Tartarata. Br.*Tartarated Soda — Rochelle Salt.*

This is the British title for *Potassii et Sodii Tartras*, U. S., or Rochelle Salt, the process for making it being given under the U. S. title, which see (2424).

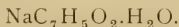
2935. Sodii Acetas.*Acetate of Sodium — Natrium Aceticum.*

This salt may be prepared by neutralizing Acetic Acid with Carbonate of Sodium, filtering the solution, concentrating by evaporation, and crystallizing. By continuing the evaporation, with stirring, it may be obtained granulated, in which form it is more convenient for pharmaceutical use.

Uses.—Acetate of Sodium is used in pharmacy for making many other salts by double decomposition, and in medicine is much esteemed as a diuretic. The dose is from 20 to 60 grains.

2936. Sodii Arsenias.*Arseniate of Sodium.*

The formula and process for making this salt will be found on page 178, which see.

2937. Sodii Benzoas.*Benzoate of Sodium — Natrium Benzoicum.*

This salt may be prepared by adding Benzoic Acid to a hot concentrated solution of pure Carbonate of Sodium as long as effervescence occurs, then evaporating to dryness and granulating by stirring, or by crystallizing from the solution.

Uses.—This salt is used in the treatment of rheumatism, and some kidney diseases. Also in septic diseases in doses of 20 to 60 grains.

2938. Sodii Bicarbonas.

*Bicarbonate of Sodium — Natrium Bicarbonicum —
"Baking Soda."*



Commercial Bicarbonate of Sodium is prepared by saturating Carbonate of Sodium with Carbonic Acid gas. As thus prepared it contains some impurities which are not desirable for medicinal use, the U. S. P. directing that the official salt shall contain 99 per cent. of Bicarbonate of Sodium. This may be made from the commercial salt by percolating 2 pounds av. with three pints of water, which dissolves out the impurities; the residue left in the percolator is then dried on blotting paper. For most purposes, however, the commercial salt is employed.

Uses.—Bicarbonate of Sodium is used for making many pharmaceutical preparations, and in medicine as an Anti-acid. In making ærated waters it is a convenient source of Carbonic Acid gas, which is liberated when it is decomposed.

2939. Sodii Bisulphis.

Bisulphite of Sodium.



The salt is prepared by passing Sulphurous Acid gas into a solution of Carbonate of Sodium until saturated, then evaporating and crystallizing.

Uses.—In the arts this salt is extensively used for treating fabrics after bleaching with chlorine to neutralize excess. In medicine it is used as an antiseptic and anti ferment in doses of 5 to 10 grains.

2940. Sodii Boras.

Borax — Borate or Bi-borate of Sodium.

This salt is described on page 199, which see.

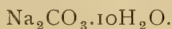
2941.

Sodii Bromidum.*Bromide of Sodium.*

This salt may be prepared according to the Br. P. in the same manner as is directed for making Bromide of Potassium, only using Solution of Soda instead of Solution of Potash, and being crystallized from warm solutions. It may also be prepared by decomposing Ferrous Bromide with Sodium Carbonate, Carbonate of Iron precipitating, and leaving Bromide of Sodium in solution which may be obtained by evaporating and crystallizing.

Uses.—This salt is used for the same purposes as Bromide of Potassium, but is thought to be less irritating to the stomach. The dose is 30 to 60 grains.

2942.

Sodii Carbonas.*Carbonate of Sodium.*

Soda Ash is an impure Carbonate of Sodium prepared by first converting common salt into Sodium Sulphate by treating with Sulphuric Acid, and then by heating the Sodium Sulphate with Calcium Carbonate (Limestone) and fine coal, which decomposes the Sulphate of Sodium, forming insoluble Sulphate of Calcium and soluble Sodium Carbonate, which is dissolved out, evaporated to dryness and further carbonated by calcining with one-fourth its weight of sawdust. This mass is then redissolved in water and the solution evaporated to dryness, which forms the Soda Ash of Commerce, an article of great commercial importance in the manufacture of paper, glass, etc.

Carbonate of Sodium is prepared from Soda Ash by lixivation and crystallization, Soda Ash containing about 50 per cent. of commercial Carbonate of Sodium. It is also prepared by the Ammonia process, and by the Cryolite process, the resultant product being the same.

Uses.—It is extensively employed in the industrial arts, and is the source of most of the sodium salts. It is seldom given in medicine except in combination. The dose is 5 to 20 grains.

2943. Sodii Carbonas Exsiccatus.*Dried Carbonate of Sodium.*

This is prepared by breaking the salt into small fragments and allowing it to effloresce by exposure to warm air for several days, then heating it to 45° C. (113° F.) until it has been converted into a white powder weighing only one half as much as the quantity taken, it is then passed through a fine sieve. The Br. P. directs 8 ounces of Carbonate of Sodium in crystals to be dried until vapors cease to be evolved, leaving a residue of about 3 ounces, entirely deprived of water, Na_2CO_3 .

Uses.—This is better for some uses in pharmacy than the crystallized salt, as its water of crystallization is driven off. It is used for making into pills and powders. The dose is 5 to 10 grains.

2944. Sodii Chloras. U. S.*Chlorate of Sodium.* NaClO_3 .

This salt may be prepared by decomposition between Acid Sodium Tartrate in solution, and Chlorate of Potassium in solution. Acid Potassium Tartrate is precipitated and Chlorate of Sodium remains in solution. The filtered solution is evaporated and crystallized.

Uses.—This may be used for the same purpose as Chlorate of Potassium, and is preferable for solutions, being more soluble. The dose is 10 to 20 grains.

2945. Sodii Chloridum.*Chloride of Sodium—Salt.* NaCl .

This is one of the most abundant and widely distributed of natural salts. It is found in beds and mines as rock salt, and in solution in sea-water and salt springs and wells obtained by drilling, from which it is separated in crystalline form by

evaporation. It is extensively used for various industrial purposes and as a seasoning and preservative of food. In pharmacy it is employed as a source of Chlorine, and in medicine is used as a styptic and for some other purposes.

2946. Sodii Citro-Tartras Effervescense. Br.

Effervescing Citro-Tartrate of Sodium.

This is made according to the Br. formula as follows:

Bicarbonate of Sodium, . . .	17 ounces or parts.
Tartaric Acid, in powder, . . .	9 ounces or parts.
Citric Acid, in powder, . . .	6 ounces or parts.
Refined Sugar, in powder, . . .	5 ounces or parts.

Mix the powders thoroughly, place them in a dish or pan of suitable form heated to between 200° and 220° F., and when the particles of the powder begin to aggregate, stir them assiduously until they assume a granular form; then, by means of suitable sieves, separate the granules of uniform and most convenient size and preserve in well stopped bottles.

Uses.—This is an effervescing salt when added to water, and is used as a refrigerant. It is given 60 to 120 grains in part of a glass of water.

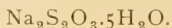
2947. Sodii Hypophosphis.

Hypophosphite of Sodium.



This salt may be most conveniently prepared by adding Carbonate of Sodium to solution of Hypophosphite of Calcium as long as a precipitate of Carbonate of Calcium is formed, then filtering and evaporating to dryness by heat of a steam-bath, stirring constantly to granulate the salt.

Uses.—This is similar in medicinal properties to other hypophosphites, and is much used in making syrups and solutions of Hypophosphites Compound, the dose being 5 to 10 grains.

2948. Sodii Hyposulphis.*Hyposulphite of Sodium.*

This salt is prepared from alkali waste by decomposing its Soluble Thiosulphate of Calcium, with Sulphate or Carbonate of Sodium.

Uses.—It is a cheap sodium salt used for tanning, paper-making, etc., and by photographers, and in other arts. In medicine it is employed as an alterative and resolvent, in doses of 10 to 30 grains.

2949. Sodii Iodidum.*Iodide of Sodium.*

This may be made in exactly the same manner as Iodide of Potassium, except the Solution of Soda must be used instead of Solution of Potassa. It may also be made by decomposing a solution of Ferrous Iodide with Carbonate of Sodium, the solution being filtered, evaporated and crystallized.

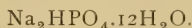
Uses.—Its uses are similar to Iodide of Potassium, the dose being 5 to 15 grains or more.

2950. Sodii Nitras.*Nitrate of Sodium — Natrium Nitricum.*

This is a native salt obtained from Chili and Peru and quite extensively sold as *Chili Saltpetre*. Being the cheapest source of nitrates it is extensively used for making Nitric Acid and some other preparations.

Uses.—Its uses are similar in medicine to Nitrate of Potassium, but it is not considered so effective. The dose is 10 to 20 grains.

2951.

Sodii Phosphas.*Phosphate of Sodium—Natrium Phosphoricum.*

This may be prepared by adding a solution of Carbonate of Sodium to a solution of Acid Phosphate of Calcium prepared from a mixture of Bone-Ash and Sulphuric Acid. The following working formula shows the preparation of the Acid Phosphate, and also of the Sodium Salt. The Acid Phosphate is first prepared and then the Sodium Salt:

Bone-Ash,	16 ounces av.
Sulphuric Acid,	10 ounces av.
Carbonate of Sodium, {	each a sufficient quantity.
Water,	

Mix the powder with the Sulphuric Acid in an earthen vessel, and add 1 pint of water. Stir thoroughly and allow to stand three days heated moderately, with occasional stirring and addition of water to make up for evaporation; then add a pint of boiling water, pour the mixture on a muslin strainer and gradually add more boiling water until the liquid passes nearly tasteless. Mix the liquids obtained and set aside to settle, then pour off the clear portion and evaporate to a pint.

This is a solution of *Acid Calcium Phosphate*, containing some Sulphate of Calcium, which is mostly precipitated upon cooling. Let cool, pour off the liquid from the deposited salt, and heat the liquid again in a porcelain vessel; to this add gradually a concentrated solution of Carbonate of Sodium so long as effervescence ensues, then filter and set aside to crystallize, the crystals being Phosphate of Sodium, and the *Neutral Phosphate of Calcium* is precipitated as a white powder.

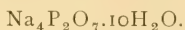
Uses.—Phosphate of Sodium is considerably used in pharmacy to prepare other phosphates, by double decomposition, and is given as a cathartic in doses of $\frac{1}{4}$ to 1 ounce. The Acid Phosphate of Calcium in solution as above prepared when diluted is the basis of the Acid Phosphates.

Liquor Acidi Phosphorici Compositum may be made by taking of this solution 1 pint, Water 2 pints, Phosphate of Sodium 2 ounces av., Carbonate of Magnesium $\frac{1}{2}$ ounce av., Phos-

phate of Iron (scale salt) 1 ounce av., dissolving and filtering. If wanted without Iron the Iron Salt may be omitted. This is used as a nerve tonic, and for making syrup for soda water, 1 ounce being added to a pint of syrup.

2952. Sodii Pyrophosphas. U. S.

Pyrophosphate of Sodium.

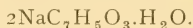


This is prepared by heating Phosphate of Sodium in a suitable vessel to redness. It first melts, losing its water of crystallization by evaporation, only 40 per cent. of the salt remaining. The heat is then increased to 300°C . (572°F .), at which temperature it is converted into tribasic phosphate, or Pyrophosphate. This residue is then dissolved in water, the solution filtered, and the salt crystallized, making Pyrophosphate of Sodium.

Uses.—This is used in making Pyrophosphate of Iron, but is not employed in medicine.

2953. Sodii Salicylas.

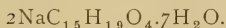
Salicylate of Sodium.



This is most conveniently prepared from Salicylic Acid by mixing 100 parts with water to form a paste; then adding 104 parts of pure crystallized Carbonate of Sodium reduced to a moderately fine powder. The reaction proceeds with effervescence caused by escaping Carbonic Acid gas. The solution is then strained, heated in a porcelain capsule until all gas is expelled, made neutral by the addition of either Salicylic Acid or Carbonate of Sodium, and evaporated at a low heat to dryness.

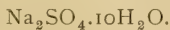
The method of preparing this from phenol is described under Salicylic Acid, which see.

Uses.—This salt is much used as a remedy for rheumatism and neuralgia, in doses of 15 to 30 grains, and in pharmacy for making other Salicylates.

2954. Sodii Santoninas.*Santoninate of Sodium.*

This may be prepared by adding to 4 fl.ounces of solution of Soda 1 fl.ounce of Water and mixing with the solution 1 ounce av. of Santonin, heating and stirring until the salt is dissolved, then filtering and setting aside to crystallize. More crystals may be obtained by further concentration and crystallization.

Uses.—This salt is sometimes used instead of Santonin as an anthelmintic, being more soluble, but it possesses no advantage over it. The dose is 1 to 3 grains.

2955. Sodii Sulphas.*Sulphate of Sodium — Glauber's Salt.*

This salt is more familiarly known as Glauber's Salt, and is obtained most altogether as a by-product of the manufacture of other chemicals. It may be readily made by adding Sulphuric Acid to a solution of Carbonate of Sodium until it is neutralized, evaporating and crystallizing.

Uses.—It is used in making other preparations and as a "physic" for horses and cattle. It is also preferred by some to Epsom Salts as a cathartic in doses of half to one ounce.

2956. Sodii Sulphis.*Sulphite of Sodium.*

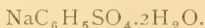
This may be most conveniently prepared by passing Sulphurous Acid gas through a concentrated solution of Carbonate of Sodium until it is completely saturated and *Acid Sodium Sulphite* is formed. To this an equal weight of Carbonate of Sodium is then added, making a solution of the *neutral Sulphite of Sodium*, which when evaporated with constant stirring to dryness yield Sulphite of Sodium as a granu-

lar salt, which is preferred for medicinal use. A crystallized salt is also obtained by crystallizing from the solution.

Uses.—This salt is used in the preparation of some pharmaceuticals, and in solution as an anti-ferment. It is also given in doses of from 10 to 30 grains.

2957. Sodii Sulphocarbolas.

Sulphocarbonate of Sodium.

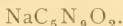


This may be prepared by mixing equal parts by weight of C. P. Sulphuric Acid and pure Carbolic Acid. The mixture must then be heated to a temperature of 55°C . (155°F .) for several days, and after that 20 parts of water added. Two parts of Carbonate of Barium are then mixed, a little at a time, with the solution to remove excess of Acid. The solution is then filtered and the Sulphocarbonate of Barium remaining in solution is decomposed by adding Carbonate of Sodium as long as a precipitate is formed. The liquid is then filtered, concentrated and crystallized.

Uses.—This is given as an antiferment in doses of 10 to 20 grains, and is used in cleansing injections. Also for making some preparations.

2958. Sodii Valerianas. Br.

Valerianate of Sodium.



The Br. P. directs this to be made as follows:

Amylic Alcohol (Fusel Oil), . . .	4 fl.ounces.
Bichromate of Potassium,	9 ounces av.
Sulphuric Acid,	$6\frac{1}{2}$ fl.ounces.
Solution of Soda, a sufficiency.	
Water,	72 fl.ounces.

Dilute the Sulphuric Acid with 10 fl.ounces of the Water, and dissolve the Bichromate of Potassium in the remainder of the Water with the aid of heat. When both liquids are cold mix them with the Amylic Alcohol in a retort or flask, with

occasional brisk agitation, until the temperature of the mixture has fallen to about 90° F. (32°C.). Connect with a condenser and distill until about 5 pints of liquid have passed. Saturate the distilled liquid accurately with the solution of Soda, remove any oily fluid that floats on the surface, evaporate till watery vapor ceases to escape, then raise the heats cautiously so as to liquefy the salt. When cold put at once into stoppered bottles.

Uses.—This salt is used for making Valerianate of Zinc and other valerianates, and is given as a nervine in doses of 1 to 5 grains.

Other Sodium Salts.

The foregoing are all the salts of Sodium official in the leading pharmacopœias, but some other salts are known and have their uses in pharmacy and medicine. The following are the most important:

2959. Carbolate of Sodium— $\text{NaC}_6\text{H}_5\text{O}$.—Made by adding metallic Sodium to Carbolic Acid and allowing the solution to crystallize.

2960. Citrate of Sodium.—By saturating a solution of Citric Acid with Bicarbonate of Sodium, concentrating the solution and crystallizing.

2961. Ethylate of Sodium.—This salt may be prepared the same as Ethylate of Potassium by heating together Acetate of Ethyl and Metallic Sodium. It is used as a caustic.

2962. Lactate of Sodium.—This may be made by diluting Lactic Acid with 3 parts of Water and saturating, while boiling, with Bicarbonate of Sodium, then evaporating.

2963. Nitrate of Sodium— NaNO_3 .—This salt may be prepared by heating together in a crucible 7 parts of Nitrate of Sodium and 1 part of Starch, dissolving the residue in Water and evaporating.

2964. Silicate of Sodium— Na_2SiO_3 .—By mixing 1 part of Silica with 2 parts of dried Carbonate of Sodium, and fusing in an earthenware crucible, and dissolving the mass, when cool and in powder, in water, then filtering, concentrating and crystallizing. The solution of this salt is known as Water-Glass. (See 1919.)

2965. Tartrate of Sodium— $\text{Na}_2\text{C}_4\text{H}_4\text{O}_6 \cdot 2\text{H}_2\text{O}$.—By dissolving 12 parts of Tartaric Acid and 15 parts Bicarbonate of Sodium, each separately in sufficient Water, mixing the solutions, filtering, concentrating and crystallizing.

Some other Salts of Sodium are used for various purposes, as, *Aluminate of Sodium*, and *Stannate of Sodium* as mordants for dyeing, and many double Salts of Sodium are known but are little used in pharmacy.

SPECIES — TEAS.

Under this heading the German and some other pharmacopœias direct a variety of mixtures of cut drugs, such as herbs, flowers, barks, roots, woods, leaves, etc., which are designed to be steeped in Water, and the liquid given as a drink or used dry as pillows, or moistened as cataplasms, etc. Several similar preparations have been put upon the market as proprietary remedies and have been quite popular. The following are official in the German Pharmacopœia; others will be found among The Standard Remedies.

2966.

Species Aromaticæ.

Aromatic Species or Herbs — Gewürzhafte Kräuter.

Peppermint, Wild Thyme, Garden Thyme, Lavender Flowers, each 2 ounces or parts, Cloves, Cubebs, each 1 ounce or part. Cut and mix them. This is used dry for filling pillows and scent bags, or may be steeped if desired.

2967.

Species Emollientes.

Emollient Cataplasm — Erweichende Kräuter.

Althæa Leaves, Mallow Leaves, Melilot, Matricaria, Flaxseed, each equal parts. This is made into a poultice for pains, sores, swellings, etc.

2968.

Species Laxantes.

Laxative Tea — St. Germain Tea — Abführender Thee.

Senna 16 parts, Elder Flowers 10 parts, Fennel 5 parts, Anise 5 parts, Bitartrate of Potassium 4 parts. Moisten the Senna previously cut; sprinkle it uniformly with the Bitartrate of Potassium and mix. When dry, add the other ingredients and mix them well together.

2969.

Species Lignorum.

Wood Tea — Holzthee.

Guaiacum Wood 5 parts, Rest-harrow Root 3 parts, Russian Liquorice Root, Sassafras Wood, each 1 part. Cut them and mix well together.

2970.

Species Pectorales.*Pectoral Tea — Brustthee.*

Althæa (Flowers),	8 parts.
Russian Liquorice Root,	3 parts.
Orris Root,	1 part.
Coltsfoot,	4 parts.
Mullein Flowers,	2 parts,
Anise,	2 parts.

Cut and mix them.

This is the most popular of the teas, being much used by the Germans for colds, influenzas and similar indispositions. A cup of boiling water is poured upon a tablespoonful of the tea and the infusion drank while warm.

SPIRITUS — SPIRITS.

As understood in Pharmacy, Spirits are solutions of volatile substances in alcoholic or hydro-alcoholic liquids made by distillation. They include solutions of volatile oils, ethers, gases and other substances. Commercially, spirits are understood to be alcohol, or alcoholic liquids, made by distillation and known as Liquors, or Spiritous Liquors.

Many liquids are familiarly known as "Spirits" that are classed in pharmacy under other headings, and many of the liquids included among the Spirits, in pharmacy, are familiarly known as essences, extracts, etc.

The following are the Spirits official in the leading pharmacopœias :

2971.

Spiritus Ætheris.*Spirit of Ether.*

The U. S. preparation is made by mixing

Stronger Ether,	30 parts or 4 fl.ounces.
Alcohol,	70 parts or 8½ fl.ounces.

The Br. preparation is:

Ether,	10 fl.ounces.
Rectified Spirit,	20 fl.ounces.

The German Pharmacopœia directs:

Ether, by weight, 1 part.

Alcohol, by weight, 3 parts.

and is familiarly known as "Hoffmann's Tropfen," although it differs from the U. S. preparation by this name.

It is used as an anodyne in doses of 20 to 60 minims.

2972. Spiritus Ætheris Compositus.

Compound Spirit of Ether — Hoffmann's Anodyne.

The U. S. formula is:

Stronger Ether, 30 parts or 4 fl.ounces.

Alcohol, 67 parts or 8 fl.ounces.

Etherial Oil, 3 parts or 150 minims.

Mix them.

The Br. formula amounts to the same, the Etherial Oil being directed to be made in the formula as it is not official in the Br. P.

This is used as an anodyne and hypnotic, being generally called for as Hoffmann's Anodyne.

The dose is from 20 to 60 minims.

2973. Spiritus Ætheris Nitrosi.

Sweet Spirit of Nitre — Spirit of Nitrous Ether.

The U. S. formula is:

Nitric Acid, 9 parts or 9 ounces av.

Sulphuric Acid, 7 parts or 7 ounces av.

Alcohol,
Distilled Water, } each a sufficient quantity.

Add the Sulphuric Acid gradually to 31 parts or 36 fl.ounces of Alcohol. When the mixture has cooled transfer it to a tubulated retort connected with a well-cooled condenser, to which a receiver, surrounded by broken ice, is connected air-tight, and which is further connected, by means of a glass tube, with a small vial containing water, the end of the tube dipping into the latter. Now add the Nitric Acid to the contents of the retort, and, having introduced a thermometer

through the tubulature, heat rapidly, by means of a water-bath, until strong reaction occurs and the temperature reaches 80° C. (176° F.). Continue the distillation at that temperature, and not exceeding 82° C. (180° F.), until the reaction ceases. Disconnect the receiver and immediately pour the distillate into a flask containing 16 parts, or 1 pint of ice-cold distilled water. Close the flask and agitate the contents repeatedly, keeping down the temperature by immersing the flask occasionally in ice-water. Then separate the ethereal layer and mix it immediately with nineteen times its weight of Alcohol.

The processes and formulas of the Br., German and other pharmacopœias differ considerably from the foregoing, but the resultant preparation is about the same.

The liquid separated from the surface of the water before mixing with Alcohol is *Nitrous Ether*, which has lately had a large sale as *concentrated Nitrous Ether*, used for making Spirit of Nitre, by mixing with 19 parts of Alcohol.

Uses.—Spirit of Nitrous Ether is much used as a diuretic and diaphoretic combined with other remedies. The dose is from 20 drops to a teaspoonful or more.

2974. Spiritus Ammoniaë. U. S.

Spirit of Ammonia.

Stronger Water of Ammonia, 8 fl.ounces.
 Alcohol, recently distilled, and which
 has been kept in glass, a quantity
 sufficient to make 16 fl.ounces.

Pour the Stronger Water of Ammonia into a flask connected with a well-cooled receiver into which a pint of Alcohol has been introduced. Heat the flask carefully and very gradually to a temperature not exceeding 60° C. (140° F.), and maintain it at that temperature for about 10 minutes; then disconnect the receiver and having ascertained the ammoniacal strength of the contents, by means of the volumetric solution of Oxalic Acid, add enough alcohol to make the product contain 10 per cent. of Ammonia.

Uses.—This is used as a stimulant and antiacid, but is not known to possess any advantage over Water of Ammonia.

2975. *Spiritus Ammoniaë Aromaticus.**Aromatic Spirit of Ammonia.*

The U. S. formula is:

Carbonate of Ammonium,	40 parts or 516	grains.
Water of Ammonia,	100 parts or 3	fl.ounces.
Oil of Lemon,	12 parts or 3	fl.drachms.
Oil of Lavender Flowers,	1 part or 15	minims.
Oil of Pimenta,	1 part or 15	minims.
Alcohol, recently distilled,	700 parts or 24¼	fl.ounces.
Distilled water to make,	1000 parts or 35	fl.ounces.

To the Water of Ammonia contained in a flask add 140 parts, or 4 fl.ounces of distilled water, and afterwards the Carbonate of Ammonia reduced to a moderately fine powder; close the flask and agitate the contents until the Carbonate is dissolved; weigh the Alcohol in a tared flask of suitable capacity, or pour 400 parts or 24¼ fl.ounces in a bottle; add the oils and afterward enough Distilled Water to make the product weigh 1000 parts, or measure 35 fl.ounces; lastly, filter through paper and keep in well-covered bottles.

The Br. P. directs this to be made by distillation of the oils with rectified Spirit and Water, and then adding the Carbonate and Solution of Ammonia. The formula is as follows:

Carbonate of Ammonium,	4	ounces av.
Strong Solution of Ammonia,	8	fl.ounces.
Volatile Oil of Nutmeg,	4½	fl.drachms.
Oil of Lemon,	6½	fl.drachms.
Rectified Spirit, sp.		
gr. 0.838,	115½	fl.ounces or 6 pints, Imp.
Water,	57½	fl.ounces or 3 pints, Imp.

Place the Oils of Lemon and Nutmeg and Rectified Spirit with the Water in a retort. Distill 7 Imperial pints (134½ fl.ounces), and then distill and separately collect an additional 9 fl.ounces. Place the 9 ounces of distillate, together with the Carbonate of Ammonium and the Strong Solution of Ammonia, in a bottle holding rather more than a pint (20 fl.ounces). Securely cork the bottle and gently warm it in a water-bath to

140° F. (60° C.), shaking it from time to time until all the salt has dissolved. Filter if necessary, when cold, through cotton-wool, and gradually mix with it the 7 pints (134½ fl.ounces) of the Distilled Spirit. The product should measure an Imperial gallon (153⅔ American fl.ounces).

Anisated Spirit of Ammonia is made with Rectified Spirit 12 fl.ounces, Oil of Aniseed 3 fl.drachms, Water of Ammonia 3 fl.ounces. The Oil is dissolved in the Rectified Spirit and the Ammonia added.

Uses.—Aromatic Spirit of Ammonia is used as a quick stimulant and diaphoretic in doses of 20 to 60 minims.

2976. Spiritus Ammoniaë Fœtidus. Br.

Fetid Spirit of Ammonia.

Asafetida, 1½ ounces av.

Strong Solution of Ammonia, . . . 2 fl.ounces.

Rectified Spirit, a sufficiency.

Break the Asafetida into small pieces and macerate it in a closed vessel in 15 fl.ounces of the Spirit for 24 hours; then distill off the Spirit, mix the product with the Solution of Ammonia, and add sufficient Spirit to make 20 fl.ounces.

Uses.—This is given as an antispasmodic and stimulant in doses of 20 to 60 minims.

2977. Spiritus Angelicæ Compositus. G. P.

Compound Spirit of Angelica.

This is made by macerating Angelica Root 16 parts, Valerian 4 parts, Juniper Berries 5 parts, cut and bruised, in Alcohol 75 parts, Water 125 parts, for 24 hours, then distilling off 100 parts and dissolving in the distillate Camphor 2 parts.

Uses.—This is an aromatic stimulant and may be given in doses of ½ to 1 teaspoonful or more.

2978. Spiritus Anisi. U. S.*Spirit of Anise.*Oil of Anise, 10 parts or $1\frac{1}{3}$ fl.ounces.Alcohol, 90 parts or $14\frac{2}{3}$ fl.ounces.

Mix them.

Uses.—This is familiarly known as *Essence of Anise*, and is considerably used as an addition to carminative mixtures, as an aromatic. The dose is 5 to 20 minims or more. (See 890.)

2979. Spiritus Armoraciæ Compositus. Br.*Compound Spirit of Horse Radish.*

Horse Radish Root scraped, . . . 20 ounces av.

Bitter Orange Peel cut and bruised, 20 ounces av.

Nutmeg, bruised, $\frac{1}{2}$ ounce av.

Proof Spirit, 153 fl.ounces.

Water, 58 fl.ounces.

Mix them and distill a gallon.

This is used as an aromatic stomachic, in doses of 1 to 2 fl.drachms.

2980. Spiritus Aurantii. U. S.*Spirit of Orange.*Oil of Orange Peel, . . . 6 parts or $1\frac{1}{8}$ fl.ounces.Alcohol, 94 parts or $14\frac{7}{8}$ fl.ounces.

Mix them.

This is used as a flavoring for elixirs, syrups, mixtures, etc. (See 509, 915.)

2981. Spiritus Cajuputi. Br.*Spirit of Cajuput.*

Oil of Cajuput, 1 fl.ounce.

Rectified Spirit, 49 fl.ounces.

Mix them. This is given as a stimulant, etc., in doses of $\frac{1}{2}$ to 1 teaspoonful.

2982. **Spiritus Camphoræ.***Spirit of Camphor.*

The U. S. formula for this spirit was changed in the 1880 pharmacopœia, the new preparation having proven generally unsatisfactory. The 1870 and 1880 formulas are, therefore, both given, the former being preferred.

1870.

Camphor, . . . 4 $\frac{3}{8}$ ounces av.
Alcohol, . . . 2 pints.

Dissolve the Camphor in the Alcohol and filter through paper.

1880.

Camphor, . . . 3 $\frac{1}{8}$ ounces av.
Alcohol, . . . 26 $\frac{1}{2}$ fl.ounces.
Water, . . . 9 fl.ounces.

Dissolve the Camphor in the Alcohol, add the Water and filter through paper.

The Br. P. formula is:

Camphor, 1 ounce av.
Rectified Spirit, 9 fl.ounces.

The G. P. formula is:

Camphor, 1 part.
Alcohol, 7 parts.
Water, 2 parts.

Uses.—Spirit of Camphor is used extensively in liniments and other similar preparations in which it is obvious that the addition of Water in the formula is inexpedient. In medicine it is used for pain, swellings, rheumatic affections and in fact for nearly everything both externally and internally. The dose is 10 to 30 minims.

2983. **Spiritus Chloroformi.***Spirit of Chloroform.*

The U. S. formula is:

Purified Chloroform, . . . 10 parts or 623 grains.
Alcohol, 90 parts or 15 fl.ounces.

It may be made with Chloroform 1 fl.ounce, Alcohol 16 fl.ounces.

The Br. formula is:

Chloroform,	1 fl.ounce.
Rectified Spirit,	19 fl.ounces.

Uses.—Spirit of Chloroform is often prescribed and dispensed as *Chloric Ether*. It is used externally and internally as an anodyne and relaxative. The dose is 20 to 60 minims.

2984. Spiritus Cinnamomi.

Spirit of Cinnamon.

The U. S. formula is:

Oil of Cinnamon,	10 parts or $1\frac{1}{3}$ fl.ounces.
Alcohol,	90 parts or $14\frac{2}{3}$ fl.ounces.

Mix them.

The Br. P. formula is:

Oil of Cinnamon,	1 fl.ounce.
Rectified Spirit,	49 fl.ounces.

Uses.—Spirit of Cinnamon is used as a flavoring ingredient for many preparations, and is given as a quick stimulant in doses of 20 to 60 minims. It is familiarly known as *Essence of Cinnamon*. (See 897.)

2985. Spiritus Cochleariæ. G. P.

Spirit of Scurvy Grass.

Scurvy-Grass,	8 parts.
Alcohol,	3 parts.
Water,	3 parts.

Cut the fresh flowering Scurvy-grass, mix it with the Alcohol and Water, and distill off 4 parts.

This is similar to but less aromatic than the Br. Spiritus Armoraciæ Compositus. The dose is 1 to 2 fl.drachms.

2986. Spiritus Formicarum. G. P.

Spirit of Formic Acid.

Alcohol,	70 parts.
Water,	26 parts.
Formic Acid,	4 parts.

Mix them. This is also called Spirit of Ants.

2987. Spiritus Frumenti.*Whisky.*

This is official in the U. S. P., and is described as an Alcoholic liquid, obtained by the distillation of fermented grain (usually corn, wheat or rye), and at least two years old. Whisky contains about 50 per cent. of Alcohol, its standard proof being 100. The method of preparing it is described under the heading SPIRITOUS LIQUORS. It is a diffusive stimulant.

2988. Spiritus Gaultheriæ. U. S.*Spirit of Gaultheria.*

Oil of Gaultheria (Wintergreen), 3 parts or 165 minims.

Alcohol, 97 parts or 1 pint.

Mix them.

This is a weak solution of the oil corresponding with the strength of similar British Spirits. To make *Essence of Wintergreen*, 1 ounce of the Oil should be dissolved in 15 fl.ounces of Alcohol. (See 927.)

2989. Spiritus Juniperi.*Spirit of Juniper.*

The U. S. formula is:

Oil of Juniper, 3 parts or 224 minims.

Alcohol, 97 parts or 1 pint.

Mix them. (See also 908.)

The liquor called gin is often prescribed under the name Spiritus Juniperi, but is entirely unlike this preparation.

The Br. formula directs Oil of Juniper 1 part, Alcohol 49 parts.

The G. P. directs Juniper Berries 4 parts, Alcohol, Water, each 15 parts, allowed to macerate for 24 hours, and then 20 parts to be distilled.

Uses.—Spirit of Juniper is used as a stimulating diuretic, and for mixtures.

2990. Spiritus Juniperi Compositus. U. S.*Compound Spirit of Juniper.*

Oil of Juniper,	10 parts or 27 minims.
Oil of Caraway,	1 part or 3 minims.
Oil of Fennel,	1 part or 3 minims.
Alcohol,	3000 parts or 20 fl.ounces.
Water, sufficient to make	5000 parts or 2 pints.

Dissolve the Oils in the Alcohol, add the Water, mix and filter. This is given as a stimulant and diuretic.

2991. Spiritus Lavandulæ.*Spirit of Lavender.*

The U. S. formula is:

Oil of Lavender Flowers, .	3 parts or 220 minims.
Alcohol,	97 parts or 16 fl.ounces.

(See also 909).

The Br. P. formula directs 1 fl.ounce of Oil of Lavender to be dissolved in 49 parts of Rectified Spirit.

The G. P. directs Lavender Flowers, 5 parts to be macerated in Alcohol 15 parts, Water 15 parts, for 24 hours, and then 20 parts distilled.

Uses.—Spirit of Lavender is given as an aromatic stimulant and stomachic in doses of 20 to 60 minims.

2992. Spiritus Limonis. U. S.*Spirit of Lemon.*

Oil of Lemon,	6 parts or 1 fl.ounce.
Lemon Peel, freshly grated, .	4 parts or ½ ounce.
Alcohol, sufficient to make	100 parts or 1 pint.

Mix, macerate and filter.

This is also known as *Essence of Lemon* or Flavoring Extract of Lemon. It is used for flavoring medicinal preparations, syrups, pastry, etc. (See also 910.)

2993. Spiritus Melissæ Compositus. G. P.*Compound Spirit of Balm.*

Balm Leaves 14 parts, Lemon Peel 12 parts, Nutmeg 6 parts, Cinnamon, Cloves, each 3 parts, are bruised and distilled with Water 250 parts, Alcohol 150 parts, recovering of the distillate 200 parts.

This is a fragrant spirit used for flavoring medicines, etc.

2994. Spiritus Menthæ Piperitæ.*Spirit of Peppermint—Essence of Peppermint.*

The U. S. formula is :

Oil of Peppermint, 10 parts or $1\frac{3}{8}$ fl.ounces.

Peppermint in coarse powder, 1 part or 60 grains.

Alcohol, sufficient to make . 100 parts or 1 pint.

The substances are mixed, macerated and filtered. By adding a little Carbonate of Magnesium to the filter a clearer preparation is produced.

The Br. P. directs 1 fl.ounce of Oil of Peppermint to be dissolved in 49 fl.ounces of Rectified Spirit.

The G. P. formula is 1 part of Oil of Peppermint dissolved in 9 parts of Alcohol.

Essence of Peppermint is usually made with Oil of Peppermint 1 ounce, Alcohol 15 ounces. (See 918.)

Uses.—This essence is extensively used as household remedy for flatulence, colic, etc. The dose is 10 to 60 drops.

2995. Spiritus Menthæ Viridis. U. S.*Spirit of Spearmint—Essence of Spearmint.*

Oil of Spearmint, 10 parts or $1\frac{3}{8}$ fl.ounces..

Spearmint in coarse powder, 1 part or 60 grains.

Alcohol, sufficient to make . 100 parts or 1 pint.

Mix, macerate and filter. (See also 925.)

Uses.—This is used for similar purposes as Essence of Peppermint.

2996. Spiritus Myrciæ. U. S.*Spirit of Myrcia—Bay Rum.*

Oil of Myrcia,	16 parts or 1 fl.ounce.
Oil of Orange Peel, . . .	1 part or 35 minims.
Oil of Pimenta,	1 part or 28 minims.
Alcohol,	1000 parts or 78 fl.ounces.
Water,	782 parts or 49 fl.ounces.
To make	1800 parts or 1 gallon.

Mix the Oils with the Alcohol and gradually add the Water to the solution. Set the mixture aside in a well-stopped bottle for 8 days, then filter through paper in a well-wetted funnel. Other formulas for Bay Rum which may be preferred to this will be found among the toilet preparations.

2997. Spiritus Myristicæ.*Spirit of Nutmeg—Essence of Nutmeg.*

The U. S. formula is:

Oil of Nutmeg,	3 parts or 220 minims.
Alcohol,	97 parts or 1 pint.

Dissolve the Oil in the Alcohol.

The Br. formula is Volatile Oil of Nutmeg 1 fl.ounce, Rectified Spirit, 49 fl.ounces.

This is used as a flavoring for medicinal preparations and pastry. (See 914.)

2998. Spiritus Odoratus.*Perfumed Spirit—Cologne Water.*

Oil of Bergamot,	16 parts or 2 fl.ounces.
Oil of Lemon,	8 parts or 1 fl.ounce.
Oil of Rosmary,	8 parts or 1 fl.ounce.
Oil of Lavender Flowers, .	4 parts or ½ fl.ounce.
Oil of Orange Flowers (Neroli),	4 parts or ½ fl.ounce.
Acetic Ether,	2 parts or ¼ fl.ounce.
Alcohol,	800 parts or 106 fl.ounces.
Water,	158 parts or 17 fl.ounces.
To make	1000 parts or 1 gallon.

Dissolve the Oils and the Ether in the Alcohol and add the Water. Set the mixture aside in a well-closed bottle for eight days, then filter through paper in a well-covered funnel.

Other formulas for Cologne which may be preferred to this will be found among the perfumes and toilet preparations.

2999. Spiritus Rosmarini. Br.

Oil of Rosemary, 1 fl.ounce.

Rectified Spirit, 49 fl.ounces.

Dissolve. An aromatic stimulant. Dose 20 to 60 minims.

3000. Spiritus Saponis. G. P.

Spirit of Soap.

Olive Oil, 60 parts.

Solution of Potassa, G. P., 70 parts.

Alcohol, 300 parts.

Water, 170 parts.

Boil the Oil and Solution of Potassa with one-fourth of the Alcohol on a water-bath until the Oil is saponified, and a small portion is found on trial to form a clear mixture with Alcohol and Water. Now replace any Alcohol lost by evaporation, add the remaining three-fourths of the Alcohol and the Water, and filter the liquid when cold.

3001. Spiritus Sinapis. G. P.

Spirit of Mustard.

Volatile Oil of Mustard, 1 part.

Alcohol, 49 parts.

Mix and dissolve. A rubefacient and quick stimulant. It is given in doses of 10 to 60 minims.

3002. Spiritus Vini Gallaci.

Brandy — French Brandy.

An Alcoholic liquid obtained by the distillation of fermented grapes, and at least four years old. It is further noticed under the heading SPIRITOUS LIQUORS.

The German-Latin title is *Spiritus Vini Cognac*.

Other Spirits.

Besides the official Spirits named, Alcohol, Diluted Alcohol, Rectified Spirit, and proof Spirit are noted under the heading ALCOHOL. The *Alcoolats* of French Pharmacy which correspond with spirits are noticed pages 94 and 453. Many of the preparations used in perfumes, and also Spiritous Liquors are classed as Spirits. A few only of those most popular in medicine, which have not been mentioned, are noticed here.

3003. Spirit of Bryony Compound.—Bryony 8 ounces, Valerian 2 ounces, Pennyroyal 3 ounces, Rue 3 ounces, Mugwort, Feverfew, Savin, each $\frac{1}{2}$ ounce, Orange Peel, Lovage seeds, each 1 ounce, Brandy 10 pints, macerate and distill.

3004. Spirit Fioravanti.—Swiss Turpentine 5 ounces, Elemi, Tacamahaca, Amber, Liquid Styrax, Galbanum, Myrrh, Bayberries, each 1 ounce, Aloes, Galangal Root, Ginger, Zedoary, Cinnamon, Cloves, Nutmeg, Cretum marium leaves, each $\frac{1}{2}$ ounce, Alcohol 2 pints, macerate 6 days and distill 25 fl.ounces. This is also known as *Balsam Fioravanti*, and is used for bruises, “black and blue” spots, etc.

3005. Spirit of Mastic Compound.—Mastic, Myrrh, Olibanum, each 1 ounce, Rectified Spirit 20 ounces, macerate and distill. This is used as an application for bruises, lameness, etc.

3006. Spirit of Honey Compound.—Honey 32 parts, Coriander 32 parts, Lemon Peel, fresh, 4 parts, Cloves 3 parts, Nutmeg, Benzoin, Storax, each 2 parts, Vanilla 1 part, Rose Water 20 parts, Orange Flower Water 20 parts, Alcohol 200 parts, macerate for 3 days and distill all the spiritous part. This is a fine aromatic for adding to other preparations or the toilet.

3007. Vulnerary Spirit.—Dried Sage, Wormwood, Fennel Hyssop, Marjoram, Savory, Thyme, Rosmary, Calamint, Balm, Peppermint, Scordium, Fresh leaves of Angelica, Basil, and Lavender Flowers, each 2 ounces, Proof Spirit 10 pints, digest 14 days and distill over 7 pints. This is a stimulant and vulnerary much used on the Continent as a cordial and cosmetic.

3008. Spirit Pyroacetic, Acetone.— C_3H_6O . This is an inflammable volatile liquid obtained by subjecting Acetate of Lead or other mineral acetates to dry distillation. The acetates are first dried to make them anhydrous and then distilled with increased heat until all the volatile portions have passed over. The receiver contains crude acetone, which is purified by various means. It is also obtained as by-product in the manufacture of Aniline and some other substances. It is a solvent for resins and oils.

3009. Spirit Pyroxylic—Wood Naphtha—Wood Spirit.—This is another name for Methylic Alcohol, which is obtained from crude Pyroligneous Acid by distillation and subsequent treatment. It was once employed considerably in medicine under the name of *Hasting's Wood Naphtha*. (See also page 95.)

STANNUM — TIN.

Symbol, Sn; Atomic weight, 117.7; Sp. gr. 7.30.

This is a metallic element known since the earliest civilization. It is found mostly in the form of ore associated with other metals, and is obtained generally by smelting, and cast in bars or made into grain tin. It is white like silver, harder than lead, very malleable, melts at 442° F., and is volatilized at a white heat. Tin is extensively used in the arts in making tin plate, tin foil, solder, etc. In solution with acids it is used as a mordant for dyeing, and its salts are somewhat used for various purposes.

It forms important alloys with many other metals, making bronze, bell metal, solder, pewter, etc.

In the form of Tin Foil it is used to quite an extent for wrapping packages to keep them from moisture and to protect them, etc. It is also used for making tubes for paints, ointments, etc.

The following are the Salts of Tin most used :

3010. Chlorides of Tin — *Stannous Chloride*. Sn Cl_2 .—An anhydrous salt is made by distilling together a mixture of Tin and Chloride of Mercury. A hydrated or crystallized salt is made by boiling Tin in excess with Hydrochloric Acid, the liquid may be poured off and evaporated to a granular salt.

Stannic Chloride, SnCl_4 . This is made by dissolving grain tin in a mixture of 2 measures of Hydrochloric Acid with one measure each of Nitric Acid and Water. The solution evaporated to granulation is known as "Salts of Tin," used for dyeing. Solution of Chloride of Tin (Stannic Chloride) is also much used for dyeing. (See 2042.) This is also known as *Spirits of Tin*.

3011. Hydrates of Tin — *Hydrated Oxide of Tin*, $\text{Sn}(\text{HO})_2$.—This is made by precipitating Stannous Chloride with Carbonate of Potassium, and washing the precipitate. *Hydrated Peroxide of Tin* or *Stannic Acid*, $\text{Sn}(\text{HO})_4$ is made by adding Carbonate of Potassium to a solution of Stannic Chloride, and washing the precipitate.

3012. Iodides of Tin — *Protiodide of Tin*, SnI_2 .—is prepared by heating tin and iodine together. *Stannic Iodide* SnI_4 is made by dissolving tin in hydriodic acid and crystallizing.

3013. Oxides of Tin — *Stannous Oxide*, SnO .—is made by igniting the Hydrate of Tin in an atmosphere of Carbonic Anhydride. *Stannic Oxide* is prepared by the action of Nitric Acid on metallic tin and washing the powder

with water. It is also prepared by heating tin above its melting point in the air. It is known as *Polisher's Putty*, and is used for polishing tin ware and other substances.

3014. Sulphides of Tin—*Stannous Sulphide*, SnS —is made by heating tin and sulphur together. *Stannic Sulphide* SnS_2 , known also as bronze powder, mosaic gold, etc., is made by melting tin 12 ounces, and adding Mercury 6 ounces, allow to cool and add Chloride of Ammonium 6 ounces, Sulphur 7 ounces, and after thoroughly mixing heating in a glass flask by a sand-bath for several hours to redness until white fumes cease to rise. This is used as a substitute for gold in bronzes, varnishes, sealing wax, etc.

3015. Tin Mordants—A great variety of these are used for dyeing, different combinations being used for different purposes. *For Cochineal*, a mixture of Nitric Acid and Water, each 2 pounds, Sal Ammoniac 2 ounces, dissolved, and $4\frac{1}{2}$ ounces of pure Tin, gradually dissolved in the liquid. *For Madder*—Nitric Acid 8 parts, Common Salt 1 part, Water 8 parts. Tin 1 part. This is the common Tin Spirit used by dyers. Other combinations are used for other purposes.

STRONTIUM.

Symbol, Sr.; Atomic weight, 87.4.

A metallic element discovered by Sir H. Davy in 1808, and similar in its characteristics to Barium, but having less metallic luster.

Its salts are chiefly used in pyrotechnics for making red fire, but are not employed in medicine.

3016. Carbonate of Strontium— SrCO_3 .—This may be prepared by adding a solution of Carbonate of Sodium to a solution of Nitrate of Strontium and collecting the precipitate.

3017. Nitrate of Strontium— Sr_2NO_3 .—This is made by saturating Nitric Acid with Carbonate of Strontium, concentrating the solution and crystallizing or stirring while evaporating to granulate. It must be dried by very gentle heat. It is used in making red fire for pyrotechnics and theatrical illuminations.

3018. Strontium Oxide— SrO .—This is obtained by igniting the Nitrate of Strontium and collecting the residue.

3019. Strontium Sulphate— SrSO_4 .—This may be made by adding Sulphuric Acid to a solution of Nitrate of Strontium; Sulphate of Strontium is precipitated.

SUCCI—JUICES.

The name juice is applied in pharmacy to a variety of very different preparations. No juices as such are now official in the U. S. P., but the Br., French and German Pharmacopœias recognize several inspissated and liquid juices. Besides the juices that are employed as medicinal agents, the juices of fruits are extensively used in making syrups for Soda Water and other purposes.

The following are the juices which may be classed as medicinal.

3020. Succus Belladonnæ. Br.

Juice of Belladonna.

Fresh leaves and young branches of Belladonna, . . . 7 pounds av.
Rectified Spirit a sufficiency.

Bruise the Belladonna in a stone mortar, press out the juice, and to every 3 measures of juice add one of the Spirit. Set aside for seven days and filter, keep in a cool place. The dose is 5 to 15 minims.

3021. Succus Conii. Br.

Juice of Hemlock.

Fresh leaves and young branches of Hemlock (Conium), 7 pounds.
Rectified Spirit, a sufficiency.

Make in the same manner as the preceding. The dose is $\frac{1}{2}$ to 1 fl.drachm.

3022. Succus Hyoscyami. Br.

Juice of Henbane.

Fresh leaves, flowering tops and young branches of Henbane, 7 pounds.
Rectified Spirit, a sufficiency.

Make in the same manner as Juice of Belladonna. Dose $\frac{1}{2}$ to 1 fl.drachm.

3023. Succus Juniperi Inspissatus. G. P.

Inspissated Juice of Juniper Berries — Extract of Juniper Berries.

Fresh Juniper Berries bruised, 1 part.
Hot Water, 4 parts.

Pour the Water on the Berries and having stirred them frequently during 12 hours, express the liquid and evaporate the strained liquid to a thin extract.

3024. Succus Liquiritiæ. G. P.*Extract of Liquorice.*

An Extract prepared by boiling and expressing the roots of *glycyrrhiza glabra*. The ordinary Extract of Liquorice of commerce. It is made up in the form of mass for manufacturing purposes, but is made into sticks for sale and use in pharmacy. The Liquorice Mass is extensively used in making plug tobacco.

3025. Succus Liquiritiæ Depuratus. G. P.*Purified Extract of Liquorice.*

Prepared by exhausting the Extract of Liquorice with cold water and evaporating the clear liquid to a thick extract. (See also 1026.)

3026. Succus Scoparii. Br.*Juice of Broom.*

Fresh Broom Tops, 7 pounds.

Rectified Spirit, a sufficiency.

Make in the same manner as Juice of Belladonna. Dose 1 to 2 fl.drachms.

3027. Succus Taraxaci. Br.*Juice of Dandelion.*

Fresh Dandelion Root, 7 pounds.

Rectified Spirit, a sufficiency.

Make in the same manner as Juice of Belladonna. Dose 1 to 2 fl.drachms.

Chicory Juice is made in the same manner.

In French Pharmacy the juices of a great number of plants prepared in a similar manner to the foregoing are used.

Fruit Juices.

Although these are not employed in medicine, except for their flavoring and acid constituents, they are extensively used by druggists for making Soda Water Syrups and aerated beverages. The following general process for preparing Fruit Juices if carefully followed will prove perfectly satisfactory:

3028. General Process for making Fruit Juices.

The fruit should be thoroughly ripe, but not over ripe, and it should be carefully selected, throwing out all that is mouldy or spoiled. Some fruits require mashing or grinding and others do not. When the juice can well be obtained without mashing the fruit, as with strawberries, raspberries and

similar fruit, it is best not to mash them, as when mashed they form a gelatinous mass from which it is more difficult to express the juice than when in their natural state. Grapes, cherries, currants and other similar fruit having a heavy skin must be ground or mashed with pounders; grinding is the best. Pineapples, apples, pears, etc., must be either ground, grated or dessicated, and pulpy fruits like lemon, orange, etc., should be chopped or otherwise cut up so that the juice may be obtained by pressure. When the fruit is properly reduced to the condition for pressing it is put in a wooden press and the juice as much as possible obtained from it by pressure. In making juice in a large way the pulp is run through wooden rollers first, by which a large portion of the juice is separated and the pomace afterward pressed in a press. A layer press is the best, but an ordinary wooden hoop cider press will do for small manufacturing and still smaller quantities may be imperfectly pressed out by hand. In small presses all the juice cannot be obtained with one pressing, and the pomace may be taken out, broken up and pressed again. When the juice is obtained, care being taken to keep it as cool and clean as possible, it may either be put up hot in bottles without any preservative or cold in bulk by adding the proper preserving ingredients. If put up hot, the juice is to be brought to a quick boil and skimmed; then, while still boiling hot, put into hot bottles taken from boiling water and at once securely corked and put away in a cool place. If put up by the cold process in bulk, it may be preserved by adding 15 per cent. of cologne Spirit of Alcohol proof, or by adding to each gallon 30 grains of Salicylic Acid dissolved in 4 ounces of Cologne Spirit, or by dissolving in it all the sugar that will hold in solution. After standing, juices deposit albuminous matter, which may be separated by decanting or filtering.

The cold process for preparing juices secures the finest product and the best flavor, much of the fine flavor of fruits being volatilized when heated. The important points to bear in mind are: first, to select good, sound ripe fruit; second, to work it up quickly and keep it cool and as little exposed as possible; and third, to put up and put away in a cool place before fermenting, or as soon as possible after the juice is obtained. No matter if the juice is "muddy," it will settle clear, and can be decanted or filtered before using. Juices put up by the cold process retain their entire flavor and most of their color; if heated, much of their flavor is dissipated and the color changed.

Fruit Syrups may be made from these juices as a rule, by adding 1 part of the juice to 4 parts of syrup. They are very convenient to use as additions to medicinal preparations and are extensively used as soda water syrups.

The following Juices and Syrups may be made in the manner which has been described:

Apricot,	Currant, Black,	Orange,	Quince,
Blackberry,	Currant, Red,	Peach,	Raspberry, Black,
Blueberry,	Grape,	Pear,	Raspberry, Red,
Cherry, Black,	Lemon,	Pineapple,	Strawberry,
Cherry, Red,	Lime,	Plum or Pruen,	and others.

SULPHUR.

Symbol, S; Atomic weight, 32.

Sulphur is an elementary substance, existing in nature mostly in combination with other substances in the form of ores, but sometimes found in a free state as a result of volcanic action. It is closely allied in its analogies and characteristics to phosphorus. Its salts, the sulphides and sulphates, are very abundant in all parts of the world, and form an important part of the mineral constituents of the earth.

Sulphur is found in three different forms in the market: Sublimed Sulphur, Roll Sulphur, and Precipitated Sulphur, all of them having their uses in the arts and in pharmacy. It combines directly with several of the elements, forming *sulphides* or *sulphurets*, which vary in their union with other bodies, some of them acting as bases and some as acids.

Sulphur is employed to a large extent for manufacturing sulphuric acid, gunpowder, vulcanized rubber, and many other articles of great commercial importance.

3029.

Sulphur Sublimatum.

Sublimed Sulphur.

S.

Sublimed Sulphur, or Flowers of Sulphur, is made by heating Sulphur and conducting the vapor into properly constructed cooled chambers, where the Sulphur collects on the sides and bottom in the form of a light powder, which is known in commerce as "Sulphur." It is a light-yellow powder, insoluble in water or alcohol, and when ignited burning with a blue flame with production of Sulphurous Acid gas. Brimstone or Roll Sulphur is the same chemically, but is run into sticks or rolls, and usually contains impurities.

Uses.—Sublimed Sulphur is used in the arts for various purposes, and given in medicine as a laxative and diaphoretic in doses of 20 to 120 grains, or more. It is used externally in the form of ointment as an application for parasitic diseases, etc.

3030.

Sulphur Lotum.*Washed Sulphur.*

S.

This is a purified Sulphur, made by washing 12 parts or 16 ounces of Sulphur with 1 part or 10 fl.drachms of Water of Ammonia and a quantity of water sufficient, so that the washing will produce no precipitate with test solution, Chloride of Barium, showing it free from soluble combinations or Sulphuric or Sulphurous Acids.

Uses.—This is intended to be used for internal administration, and is frequently mixed with Cream of Tartar and taken as a laxative and blood-cleanser.

3031. Sulphur Præcipitatum Lac Sulphur.*Precipitated Sulphur—Milk of Sulphur.*

S.

Sublimed Sulphur, 100 parts or 2 pounds.

Lime, 50 parts or 1 pound.

Hydrochloric Acid, }
Water, } each a sufficient quantity.

Slake the Lime and make it into a uniform mixture with 500 parts or 10 pints of Water; add the Sulphur, previously well dried and sifted, and mix well together; then add 1000 parts or 20 pints of water, and heat the mixture to boiling for one hour, stirring constantly, and adding water occasionally to make up for evaporation; then cover the vessel, allow to cool, pour off the clear solution and filter the remainder, adding the filtrate to the poured off portion, and gradually add to the liquid Hydrochloric Acid diluted with an equal volume of Water until the liquid is nearly neutral but still slightly alkaline. Collect the precipitate which forms on a strainer and wash with water until the washings are tasteless, and dry by gentle heat.

Uses.—Precipitated Sulphur is much used in making hair restoratives and generally in liquid preparations, when Sul-

phur is required to be suspended, as it is much finer and softer than other forms of Sulphur. It is also used in making ointments, cerates, etc. The dose is from 30 grains to 3 drachms.

3032. Sulphuris Iodidum.

Iodide of Sulphur.

Washed Sulphur, 1 part or 1 ounce.

Iodine, 4 parts or 4 ounces.

Rub them together until they are thoroughly mixed, then introduce the mixture into a flask, close the orifice loosely, and apply a gentle heat, so as to darken the mass without melting it. When the color has become uniformly dark throughout, increase the heat so as to liquefy the mass, and incline the flask in different directions in order to return into the liquid any portion of the Iodine which may have condensed on the inner surface of the flask; then withdraw the heat, and after the liquid has become solid break the flask and remove the mass to glass-stoppered bottles.

Uses.—This compound is chiefly used for making ointment for skin diseases.

Other Forms of Sulphur.

3033. Amorphous Sulphur—*Sulphur Fuscum, Brown Sulphur, Red Sulphur.*—This is prepared from Sublimed Sulphur by melting it, increasing the heat to from 320° to 350° F., and continuing at that temperature for about half an hour, or until it becomes brown and viscid, then pouring into water. In this state it is ductile and easily moulded like wax, but does not become fluid until heated to over 600° F.

3034. Roll Sulphur or Brimstone.—This is Crude Sulphur purified by melting, skimming and pouring it into moulds. It is used extensively for bleaching, burning more readily than sublimed Sulphur, and as a cement for setting stone and many other purposes. It is seldom employed in medicine because of its impurities.

3035. Sulphur Vivum—*Black Sulphur, Crude Sulphur, Horse Brimstone.*—This is Crude native Sulphur, a gray or mouse-colored powder. It is seldom found in the market,—the residuum of the subliming pots being substituted for it. It contains quite a large percentage of Arsenic, and is therefore not used except for horses and stock.

Salts of Sulphur.

The Iodide of Sulphur is the only official salt in which sulphur acts as the basic substance. It forms compounds, however, with the other halogen elements, Bromine—*Bromide of Sulphur* S_2Br_2 , and with Chlorine—*Chloride of Sulphur*, S_2Cl_2 , but they are seldom used.

With most of the positive elements Sulphur combines, forming *Sulphides* or *Sulphurets*, which are noticed under the basic elements with which the combination is made. The name *hepar* was given by the old chemists to the liver-colored combinations formed by the union of Sulphur with antimony, potassa, soda, calcium, etc. It is still retained in Homœopathic Pharmacy. *Hepar Sulphuris* or Hepar Sulphur (Calx Sulphurata), *Hepar Sulphuris Kalinum* (Sulphuretted Potash), being the official titles in their pharmacœia.

Acids of Sulphur.

Sulphur forms combinations with hydrogen and oxygen, as follows :

3036. Hydrogen Sulphide—*Sulphuretted Hydrogen* H_2S .—This is an inflammable gas occurring in nature and produced by the decomposition of substances containing sulphur. It may be conveniently prepared by decomposing ferrous sulphide with Sulphuric Acid diluted with water. This gas is extensively used in chemical laboratories in the manufacture of chemicals.

Hydrogen Persulphide is an oily fluid similar in properties and uses to Hydrogen Peroxide.

With Oxygen, Sulphur forms two oxides, which are known as Sulphurous and Sulphuric Anhydrides, and which unite with the elements of water making Sulphurous and Sulphuric Acids.

3037. Sulphurous Acid— H_2SO_3 .—When Sulphur is burned in the atmosphere, gaseous Sulphurous Anhydride or Oxide SO_2 is formed, which, when dissolved in water produces Sulphurous Acid. The Sulphurous Acid of the market contains about 5 per cent. or less of the gas. (See page 74.) The salts formed with this acid and basis are called *Sulphites*.

3038. Sulphuric Acid— H_2SO_4 .—*Oil of Vitriol*.—This Acid is now mostly made by roasting iron pyrites or Bisulphide of Iron or other Sulphides, the metals of which have a commercial value. The Sulphur contained in the compounds is converted into Sulphuric Acid by distilling its vapor, which consists of Sulphuric anhydride or Oxide SO_3 , which unites with the elements of water, forming Sulphuric Acid. This Acid is extensively used in various manufacturing industries and in pharmacy. (See page 73.) The salts formed with this acid and bases are called *Sulphates*.

Besides these acids formed from the oxides of Sulphur, *Hypo-Sulphurous Acid*, H_2SO_2 , the oxide corresponding to which has not been determined, *Thiosulphuric Acid*, $H_2S_2O_3$ and other Acids, forming a Thionic series, are known.

3039. Sulpho-Acids.—Sulphuric Acids unites with some other acids, forming a class of Sulpho-Acids.

3040. Sulpho-Carboic Acid— $\text{HC}_6\text{H}_5\text{SO}_4$ —is made by mixing equivalent weights of Sulphuric and Carboic Acids. It is obtained from its solution as a solid by crystallization. This Acid forms with metallic bases a class of salts known as *Sulphocarbolates*, as Sulphocarbolate of Calcium $\text{Ca}(\text{C}_6\text{H}_5\text{SO}_4)_2$, Sulphocarbolate of Copper $\text{Cu}(\text{C}_6\text{H}_5\text{SO}_4)_2$, Sulphocarbolate of Iron, $\text{Fe}(\text{C}_6\text{H}_5\text{SO}_4)_2$, Sulphocarbolate of Sodium, $\text{Na}(\text{C}_6\text{H}_5\text{SO}_4)$, Sulphocarbolate of Potassium, $\text{K}(\text{C}_6\text{H}_5\text{SO}_4)$, Sulphocarbolate of Ammonium, $\text{NH}_4\text{C}_6\text{H}_5\text{SO}_4$, Sulphocarbolate of Zinc, $\text{Zn}(\text{C}_6\text{H}_5\text{SO}_4)_2$, etc.

3041. Sulphocyanogen.—This is a compound, made by the union of Sulphur and Cyanogen, acting as an acid and forming with some bases salts known as *Sulphocyanides*.

3042. Sulphovinic Acid— $\text{C}_3\text{H}_5\text{HSO}_4$.—This acid is formed by the union of Sulphuric Acid with the Ethylic Alcohol radical before the formation of ether is completed. The salts of this acid are called *Sulpho vinates*, or *Sulphethylates*, as Sulphethylate of Calcium, copper, potassium, sodium, etc.

SUPPOSITORIA — SUPPOSITORIES.

Suppositories are bodies, usually of cone shape, and made of some substance readily melted or soluble at the temperature of the internal cavities of the body. They are prepared with medicinal substances mixed with the mass so that their effect will be obtained as the suppository melts.

Moulds of suitable form may be obtained for making suppositories, the ones usually employed being cone-shape for making rectal suppositories.

Many substances have been employed as a base for suppositories, but none has been found so suitable for this purpose as Oil of Theobroma ("Butter of Cacao").

It melts readily at the temperature of the body, yet has consistence enough to retain its form at ordinary temperatures. It is mild, bland, and non-irritant. Many attempts have been made to introduce suppositories in which Gelatin is used as a base; but without success, for the reason that it cannot be made soluble at the normal temperature of the body, and is therefore worthless for this purpose.

The following is in substance the general formula for suppositories given in the 1880 Pharmacopœia:

3043. General Formula for Suppositories.

Mix the medicinal substance, or substances (previously brought to a proper consistence if necessary), with a small quantity of Oil of Theobroma, by rubbing them together, and add the mixture to the remainder of the Oil of Theobroma, previously melted and cooled to the temperature of 35° C. (95° F.). Then mix thoroughly without applying more heat and immediately pour the mixture into suitable moulds, which have been previously cooled on ice. The melted oil, etc., should be stirred before filling each mould.

Suppositories may be made without moulds by mixing the medicinal substance, or substances, with a small portion of the Oil of Theobroma in a mortar which has been slightly warmed, and then adding the remainder of the Oil of Theobroma and mixing thoroughly. When thus mixed the mass may be transferred to a pill tile (which has been sprinkled with flour or other convenient substance to prevent it sticking), rolled out and divided the same as a pill mass. The sections may then be made conical in shape by rolling one end of them on the pill tile.

This is by far the most convenient way to make suppositories when prescribed, and it ensures a more even distribution of the medicinal agent than when made by heat, as it is almost impossible to incorporate many of the solid extracts with the melted oil.

The solid Extracts must be softened by rubbing with a little water or alcohol before mixing with the Oil.

Several machines for making suppositories by the cold process have been invented, some of which are very good, though but few druggists have enough demand for suppositories to make it profitable to buy one.

The following general formula for making one dozen 15 grains suppositories will be found convenient for reference.

3044. Formula for one dozen Suppositories.

The medicinal substance or substances.

Oil of Theobroma, sufficient to make . 180 grains.

Make as previously directed.

This is the size that is usually prescribed as rectal suppositories with which druggists are most familiar. They are usually made conical in form.

Vaginal suppositories are usually made at least double this size, and oviform.

Urethral Suppositories are generally made "long, slim and slender," like a pipe stem.

Pessaries are made larger than any of the preceding, and usually ob-oviform. Suppositories are also made hollow for the introduction of medicine, but are not in general favor, as the prolonged action of the medicine by the gradual, melting of the suppository, is usually desired.

A great variety of combinations are made up in the form of Suppositories, being naturally classed according to the uses for which they are designed, as Anodyne, Antiseptic, Astringent, Hypnotic, etc. There are also Rectal, Urethral, Vaginal, Aural, and Nasal Suppositories, made up in different forms to suit the localities in which they are designed to be used.

The medicinal composition of the principal Suppositories is shown in the following list, each Suppository containing the stated quantity of the medicinal agent, with sufficient Cacao Butter to make them. Other substances also are used as a base for Suppositories, as Starch Plasma, Soap, etc., but they are not as good as Cacao Butter:

Rectal Suppositories.

These are generally made in cone-shape moulds, containing about 15 grains. The moulds are dusted with Lycopodium or fine Starch, and cooled on ice before pouring in the material.

ANODYNE.

3045. Extract Belladonna.—These are made $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain in each of Extract of Belladonna.

3046. Extract Hyoscyamus.—These are made to contain 3 or 5 grains each of Extract Hyoscyamus.

3047. Hyoscyamus and Opium.—Extract Hyoscyamus 2 grains, Aqueous Extract Opium 1 grain; or Hyoscyamus

4 grains, Aqueous Extract Opium 1 grain, in each.

3048. Hyoscyamus, Codeine, and Cannabis Indica.—Extract Hyoscyamus, Codeine, each 1 grain, Extract Cannabis Indica $\frac{1}{2}$ grain; or Extract Hyoscyamus, Codeine, and Extract Cannabis Indica, each 2 grains, in each suppository.

3049. Hyoscyamus, Coca, and Cannabis Indica.—Extract Hyoscyamus 1 grain, Extract Coca 2 grains, Extract Cannabis Indica $\frac{1}{2}$ grain; or Extract Hyoscyamus 4 grains, Extract Coca 5 grains, Extract Cannabis Indica 2 grains, in each suppository.

3050. Morphine Sulphate or Acetate.—These are made with either the Sulphate or Acetate of Morphine, to contain $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{2}$, or 1 grain of the salt.

3051. Morphine and Atropine.—Sulphate of Morphine $\frac{1}{8}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain; or Sulphate of Morphine $\frac{1}{2}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, in each suppository.

3052. Morphine, Atropine, and Cocaine.—Sulphate of Morphine $\frac{1}{4}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, Hydrochlorate of Cocaine $\frac{1}{8}$ grain; or Sulphate of Morphine $\frac{1}{2}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, Hydrochlorate of Cocaine $\frac{1}{6}$ grain, in each suppository.

3053. Morphine, Atropine, Cocaine, and Cannabis Indica.—Sulphate of Morphine $\frac{1}{4}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, Hydrochlorate of Cocaine $\frac{1}{8}$ grain, and Extract Cannabis Indica $\frac{1}{2}$ grain; or Sulphate of Morphine $\frac{1}{2}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, Hydrochlorate of Co-

caine $\frac{1}{2}$ grain, Extract Cannabis Indica $\frac{1}{2}$ grain, in each suppository.

3054. Opium.—These are made to contain $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 3, or 4 grains each of Powdered Opium.

3055. Extract Opium.—These are made to contain $\frac{1}{4}$, $\frac{1}{2}$, 1, or 2 grains each of Aqueous Extract of Opium.

3056. Opium and Belladonna.—These are made in a great many proportions as follows: Powdered Opium $\frac{1}{2}$ grain, Extract Belladonna $\frac{1}{4}$ grain; Powdered Opium 1 grain, Extract Belladonna $\frac{1}{4}$ grain; Powdered Opium 2 grains, Extract Belladonna $\frac{1}{2}$ grain; Powdered Opium 3 grains, Extract Belladonna $\frac{1}{2}$ grain.

3057. Extract Opium and Belladonna.—These are made in several proportions as follows: Aqueous Extract Opium $\frac{1}{2}$ grain, Extract Belladonna $\frac{1}{8}$ grain; Aqueous Extract Opium 1 grain, Extract Belladonna $\frac{1}{2}$ grain; Aqueous Extract Opium 1 $\frac{1}{2}$ grain, Extract Belladonna $\frac{1}{2}$ grain; Aqueous Extract Opium 2 grains, Extract Belladonna $\frac{1}{2}$ grain; Aqueous Extract Opium 2 grains, Extract Belladonna 1 grain.

3058. Opium and Ipecac.—These are made with Powdered Opium 1 grain, Powdered Ipecac 1 grain; Powdered Opium 2 grains, Powdered Ipecac 2 grains.

ASTRINGENT.

Those which contain a larger quantity of the medicinal agent than can well be contained in a 15-grain mould are made of a correspondingly larger size.

3059. Extract Belladonna and Acetate of Lead.—These are made with Extract of Belladonna $\frac{1}{4}$ grain, Acetate of Lead, 1 $\frac{1}{2}$ grains; or Extract of Belladonna $\frac{1}{2}$ grain, Acetate of Lead 3 grains.

3060. Extract Belladonna and Tannin Compound.—Extract Belladonna $\frac{1}{2}$ grain, Tannin 5 grains, Sul-

phate of Morphine $\frac{1}{4}$ grain, Iodide of Lead 3 grains, in each.

3061. Extract Krameria.—These are made to contain 3 grains, 5 grains, or 10 grains of the Extract in each.

3062. Extract Stramonium and Acetate of Lead.—These are made with Extract Stramonium 1 grain, Acetate of Lead 2 grains, in each.

3063. Extract Stramonium and Tannin.—These are made to contain Extract Stramonium 1 grain, Tannic Acid 5 grains, in each.

3064. Extract Stramonium and Tannin Compound.—Extract Stramonium $\frac{1}{2}$ grain, Tannic Acid $\frac{1}{2}$ grain, Carbonate of Lead 1 grain, Liquor Subacetate of Lead 2 minims, Creasote $\frac{1}{2}$ minim, in each.

3065. Gallic Acid, Ergot, and Digitalis.—These are made with Gallic Acid 2 grains, Extract Ergot 5 grains, Digitalis 1 grain; or Gallic Acid 5 grains, Extract Ergot 10 grains, Digitalis 2 grains, in each.

3066. Opium and Acetate of Lead.—These are made of several proportions, as follows :

Powdered Opium 1 grain, Acetate of Lead 2 grains; Powdered Opium 2 grains, Acetate of Lead 2 grains; Powdered Opium 1 grain, Acetate of Lead 5 grains; Powdered Opium 2 grains, Acetate of Lead 5 grains.

3067. Tannic Acid.—These are made to contain 2 grains, 5 grains, or 10 grains of Tannin in each suppository.

3068. Tannic Acid and Bismuth.—These are made to contain Tannic Acid 5 grains, Bismuth Subnitrate 10 grains; Tannic Acid 10 grains, Bismuth 20 grains, in each.

3069. Tannic Acid and Opium.—A number of combinations are made as follows :

Tannic Acid 2 grains, Powdered Opium 1 grain; Tannic Acid 2 grains, Powdered Opium 2 grains; Tannic Acid 5 grains, Powdered Opium 1 grain; Tannic Acid 5 grains, Powdered Opium 2 grains.

3070. Tannin, Extract Krameria, and Gallic Acid.—These are made to contain Tannic Acid 5 grains, Extract Krameria 1 grain, and Gallic Acid 2 grains; or Tannic Acid 10 grains, Extract Krameria 5 grains, Gallic Acid 4 grains.

3071. Tannin, Eucalyptol, and Iodoform.—These are made with Tannic Acid 5 grains, Eucalyptol 1 minim, Iodoform 2 grains; or Tannin 20 grains, Eucalyptol 2 minims, Iodoform 5 grains, in each.

3072. Tannin, Bismuth, and Corrosive Sublimate.—Tannin 5 grains, Bismuth Subnitrate 5 grains, Corrosive Sublimate $\frac{1}{30}$ grain; or Tannin 10 grains, Bismuth Subnitrate 10 grains, Corrosive Sublimate $\frac{1}{30}$ grain, in each suppository.

3073. Thymol and Bismuth.—Thymol 2 grains, Bismuth Subnitrate 10 grains; or Thymol 1 grain, Bismuth Subnitrate 20 grains, in each.

ANTISEPTIC.

Many of these require to be made larger than the 15-grain size.

3074. Boric Acid.—These are made to contain 5 grains of Boric Acid in each.

3075. Boric Acid, Thymol, and Eucalyptus.—Boric Acid 5 grains, Thymol 2 grains, Oil Eucalyptus 1 minim; or Boric Acid 10 grains, Thymol 1 grain, Oil Eucalyptus 3 minims, in each.

3076. Benzoic Acid, Corrosive Sublimate, and Resorcin.—These

are made, Benzoic Acid 5 grains, Resorcin 10 grains, Corrosive Sublimate $\frac{1}{10}$ grain; or Benzoic Acid 10 grains, Resorcin 10 grains, Corrosive Sublimate $\frac{1}{10}$ grains, in each.

3077. Iodoform.—These are made to contain 1, 2, or 3 grains of Iodoform in each suppository.

3078. Iodoform and Tannic Acid.—Iodoform 5 grains, Tannin 10 grains;

or Iodoform 5 grains, Tannin 20 grains in each suppository.

3079. Iodoform, Thymol, and Resorcin.—Iodoform 2 grains, Thymol 1 grain, Resorcin 10 grains; or Iodoform 5 grains, Thymol 1 grain, Resorcin 10 grains, in each suppository.

3080. Naphthalin Compound.—Naphthalin 2 grains, Borax 10 grains, Corrosive Sublimate $\frac{1}{30}$ grain, Oil Eucalyptus 2 minims; or Naphthalin 3 grains, Borax 10 grains, Corrosive Sublimate $\frac{1}{10}$ grain, Oil Eucalyptus 2 minims, in each.

3081. Salicylic, and Boric Acid with Thymol.—Salicylic Acid 5 grains, Boric Acid 5 grains, Thymol 2 grains; or Salicylic Acid 10 grains, Boric Acid 10 grains, Thymol 5 grains, in each suppository.

HYPNOTIC.

Most of these Suppositories contain a larger quantity of medicine than can be made up into ordinary size suppositories, and must be made larger.

3082. Chloral Hydrate, Atropine, and Morphine.—Chloral Hydrate 10 grains, Sulphate of Atropine $\frac{1}{100}$ grain, Sulphate of Morphine $\frac{1}{4}$ grain; or Chloral Hydrate 30 grains, Sulphate of Atropine $\frac{1}{100}$ grain, Sulphate of Morphine $\frac{1}{2}$ grain, in each suppository.

3083. Chloral Hydrate, Monobromated Camphor, and Hyoscyamine.—Chloral Hydrate 15 grains, Monobromated Camphor 5 grains, Hydrochlorate of Hyoscyamine $\frac{1}{100}$ grain; or Chloral Hydrate 20 grains, Monobromated Camphor 10 grains, Hydrochlorate of Hyoscyamine $\frac{1}{80}$ grain in each.

3084. Chloral Hydrate, Morphine, and Atropine.—Chloral Hydrate 15 grains, Sulphate of Morphine $\frac{1}{4}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain; or Chloral Hydrate 20 grains, Sulphate of Morphine $\frac{1}{2}$ grain, Sulphate of Atropine $\frac{1}{100}$ grain, in each.

3085. Lupuline, Codeine, and Hyoscyne.—Lupuline 5 grains, Codeine 1 grain, Hyoscyne Hydrobromate $\frac{1}{100}$ grain; or Lupuline 10 grains, Codeine 2 grains, Hyoscyne Hydrobromate $\frac{1}{60}$ grain, in each.

3086. Lupuline and Opium Compound.—Lupuline 5 grains, Extract Hyoscyamus 1 grain, Extract Cannabis Indica 1 grain, Extract Opium $\frac{1}{2}$ grain; or Lupuline 15 grains, Extract Hyoscyamus 2 grains, Extract Cannabis Indica 2 grains, Extract Opium 1 grain, in each.

3087. Lupuline and Cannabis Indica Compound.—Lupuline 5 grains, Extract Hyoscyamus 1 grain, Monobromated Camphor 2 grains, Extract Cannabis Indica $\frac{1}{2}$ grain; or Lupuline 15 grains, Extract Hyoscyamus 2 grains, Monobromated Camphor 2 grains, Extract Cannabis Indica 1 grain, in each.

Urethral Suppositories.

These Suppositories are made long and slim and of a uniform size, $\frac{1}{8}$ inch or smaller, suitable for inserting in the urethra. They may be made up in the same manner that pills are made into rolls before cutting. They are

used for gonorrhœa, gleet, stricture, and other irritations or ailments of the urethra. They are usually made from two to three inches long.

3088. Bismuth and Lead.—Subcarbonate of Bismuth 2 grains, Carbonate of Lead 1 grain; or Subcarbonate of Bismuth 3 grains, Carbonate of Lead 1 grain, in each.

3089. Calomel and Chlorate of Potassium.—Calomel 1 grain, Chlorate of Potassium 1 grain; or Calomel 2 grains, Chlorate of Potassium 3 grains, in each.

3090. Calomel, Corrosive Sublimate, and Eucalyptus.—Calomel 1 grain, Corrosive Sublimate $\frac{1}{30}$ grain, Oil Eucalyptus 1 minim; or Calomel 5 grains, Corrosive Sublimate $\frac{1}{30}$ grain, Oil Eucalyptus 1 minim, in each.

3091. Copaiba and Tannin.—Copaiba 2 minims, Tannic Acid 2 grains; or Copaiba 3 minims, Tannic Acid 3 minims in each.

3092. Copaiba and Bismuth.—Copaiba 2 minims, Subnitrate of Bis-

muth 3 grains; or Copaiba 3 minims, Subnitrate of Bismuth 5 grains, in each suppository.

3093. Copaiba, Cubebs, and Salicin.—Copaiba 2 minims, Oil of Cubebs 1 minim, Salicin 3 grains; or Copaiba 2 minims, Oil Cubebs 1 minim, Salicin 3 grains, in each.

3094. Hydrastine and Salicin.—Hydrastine $\frac{1}{2}$ grain, Salicin 2 grains; or Hydrastine 1 grain, Salicin 3 grains in each.

3095. Iodoform, Tannin, and Thymol.—Iodoform 2 grains, Tannic Acid 1 grain, Thymol $\frac{1}{2}$ grain; or Iodoform 2 grains, Tannic Acid 1 grain, Thymol $\frac{1}{2}$ grain, in each.

3096. Zinc and Copper Sulphates.—Sulphate of Zinc 1 grain, Sulphate of Copper 1 grain; or Sulphate of Zinc 3 grains, and Sulphate of Copper 1 grain, in each.

Vaginal Suppositories.

These Suppositories are made much larger, and usually of an oviform shape. Mould may be obtained for making them, or for extemporaneous use they may be formed by hand into the required shape. The formulæ are as follows:

3097. Copaiba and Tannin.—Copaiba 30 grains, Tannic Acid 20 grains, Oil Cloves 1 minim; or Copaiba 15 grains, Tannic Acid 10 grains, Oil Cloves 2 minims, in each.

3098. Iodoform and Corrosive Sublimate.—Iodoform 5 grains, Corrosive Sublimate $\frac{1}{30}$ grain; or Iodoform 10 grains, Corrosive Sublimate $\frac{1}{10}$ grain, in each.

3099. Iodoform and Tannin.—Iodoform 5 grains, Tannic Acid 15 grains; or Iodoform 5 grains, Tannic Acid 30 grains, in each.

3100. Salicylic, Boric, and Tannic Acids.—Salicylic Acid 10 grains,

Boric Acid 5 grains, Tannic Acid 20 grains; or Salicylic Acid 15 grains, Boric Acid 5 grains, Tannic Acid 20 grains, in each.

3101. Tannic and Boric Acid.—Tannic Acid 40 grains, Boric Acid 5 grains; or Tannic Acid 40 grains, Boric Acid 10 grains, in each.

3102. Tannin and Bismuth.—Tannic Acid 20 grains, Subnitrate of Bismuth 20 grains; or Tannic Acid 20 grains, and Subnitrate of Bismuth 40 grains, in each.

3103. Tannin, Bromide, and Chlorate of Potassium.—Tannic Acid 20 grains, Bromide of Potassium 15

grains, Chlorate of Potassium 10 grains; or Tannic Acid 35 grains, Bromide of Potassium 20 grains, Chlorate of Potassium 10 grains, in each.

3104. Nitrate and Acetate of Lead.—Nitrate of Lead 2 grains, Acetate of Lead 5 grains; or Nitrate of Lead 5 grains, and Acetate of Lead 10 grains, in each.

3105. Lead Bismuth and Eucalyptol.—Carbonate of Lead 10 grains, Subcarbonate of Bismuth 10 grains, Eucalyptol 2 minims; or Carbonate of Lead 10 grains, Subcarbonate of Bismuth 10 grains, Eucalyptol 2 minims, in each.

3106. Zinc and Thymol.—Oxide of Zinc 5 grains, Sulphocarbolate of Zinc 10 grains, Thymol 2 grains; or Oxide of Zinc 10 grains, Sulphocarbolate of Zinc 20 grains, Thymol 5 grains, in each.

3107. Resorcin Salicin and Bismuth.—Resorcin 5 grains, Subnitrate of Bismuth 20 grains, Salicin 10 grains; or Resorcin 10 grains, Subnitrate of Bismuth 30 grains, and Salicin 10 grains, in each.

3108. Salicin and Cocaine.—Salicin 20 grains, Hydrochlorate of Cocaine $\frac{1}{2}$ grain; or Salicin 40 grains, Hydrochlorate of Cocaine 1 grain, in each.

Other Suppositories.

Besides the Suppositories enumerated, there are *Aural Suppositories*, containing small quantities of medicinal substances in small oblong suppositories, and *Nasal Suppositories*, also small, and containing small quantities of medicinal agents mostly of an antiseptic nature. These are but little used, and it is not necessary to give their composition here.

The Suppositories of the Br. P. are as follows:

3109. Suppositoria Acidi Carbolici cum Sapone — *Carbolic Acid Suppositories.*—Carbolic Acid 12 grains, Curd Soap 180 grains, Glycerine of Starch 40 grains, or a sufficiency. Mix the ingredients so as to form a paste of suitable consistence, and make 12 Suppositories by hand.

3110. Suppositoria Acidi Tannici — *Tannic Acid Suppositories.*—Tannic Acid 36 grains, Oil of Theobroma 144 grains. Make 12 Suppositories by running in moulds.

3111. Suppositoria Acidi Tannici cum Sapone — *Tannic Acid Suppositories with Soap.*—Tannic Acid 36 grains, Glycerine of Starch 30 grains, Curd Soap in powder 100 grains, Starch in powder, a sufficiency. Mix, roll and mould by hand into 12 Suppositories.

3112. Suppositoria Hydrargyri — *Mercurial Suppositories.*—Ointment of Mercury 60 grains, Oil of Theobroma 120 grains. Make into 12 Suppositories by warming them gently together and running into moulds.

3113. Suppositoria Iodoformi — *Iodoform Suppositories.*—Iodoform in powder 36 grains, Oil of Theobroma 144 grains. Make into 12 Suppositories.

3114. Suppositoria Morphinae — *Morphine Suppositories.*—Hydrochlorate of Morphine 6 grains, Glycerine of Starch 30 grains; Curd Soap in

powder 100 grains, Starch in powder, a sufficiency. Make 12 Suppositories by hand.

3115. Suppositoria Morphinae cum Sapone—*Morphine Suppositories with Soap*.—Hydrochlorate of Morphine 6 grains, Glycerine of Starch 30 grains, Curd Soap in powder 100 grains, Starch in powder, a sufficiency. Make 12 Suppositories by hand.

3116. Suppositoria Plumbi Composita—*Compound Lead Suppositories*.—Acetate of Lead 36 grains, Opium in powder 12 grains, Oil of Theobroma 132 grains. Make 12 Suppositories by running in moulds.

A few other Suppositories have a popular sale as proprietary remedies, as :

3117. Pile Suppositories.—These may be variously made, but as good a formula as any is Opium in powder 2 grains, Galls in fine powder 10 grains, with sufficient Oil of Theobroma to make a 30-grain Suppository.

3118. Purgative Suppositories.—These may be most conveniently made of powdered Elaterium 1 grain, made up with Oil of Theobroma into a suppository.

3119. Vermifuge Suppositories—For pin worms.—Aloes 10 to 20 grains in powder made up into 30-grain Suppositories.

SYRUP—SYRUPS.

Syrups as understood in pharmacy are concentrated Solutions of Sugar in Water or other aqueous liquids, containing, usually, some flavoring or medicinal ingredients. They are prepared by dissolving the sugar in the medicinal solution either by the aid of heat or by agitation, or stirring cold, the latter method being now quite generally employed as the flavor of the preparation is better retained by the cold process.

The best process for making Syrups is by water-bath percolation, as by this method the making of the Syrup is facilitated by the heat without exposure, and the flavor and strength of the preparation is unimpaired.

Only the best quality of granulated sugar should be used for making Syrups, and the water should, if not distilled, be free from all impurities. Rain water boiled and filtered is sufficiently pure for most purposes.

Many of the Syrups do not keep well during the summer. Such Syrups should only be made in small quantities and if

admissible should be rubbed in a mortar with a few drops only of Oil of Cloves, which prevent them from spoiling for a long time. Syrups should be made slightly heavier of sugar for summer use than when designed to be used in the winter.

A great number of Syrups are employed in pharmacy, but only a comparatively small number are official. Those official in the U. S., Br., and German Pharmacopœias will first be considered, and then the more important unofficial Syrups.

3120. Syrupus—Syrupus Simplex.

Syrup.—Simple Syrup.

The U. S. 1880 formula is:

Sugar, in coarse powder,	65 parts or 28 $\frac{3}{8}$ ounces av.
Distilled water, enough to make	100 parts or 2 pints.

Two pints of Syrup as thus prepared weighs as follows:

Weight in grains,	19102
Weight in av. ounces (nearly),	43 $\frac{2}{3}$
Specific gravity,	1.310

Dissolve the Sugar with the aid of heat in 11 fl.ounces of Distilled Water, raise the temperature to the boiling point, and strain the solution while hot. Then incorporate with the solution enough Distilled Water, added through the strainer, to make the Syrup measure two pints, or weigh as above. This is dispensed as Simple Syrup and used as the basis of other Syrups.

MADE BY WATER-BATH PERCOLATION.

Sugar, granulated,	7 pounds 1 $\frac{1}{2}$ ounces av.
Distilled, or pure Water, enough to make a gallon.	

Having covered the perforated diaphragm of the water-bath percolator with a piece of muslin or canton flannel, put the sugar upon it in the percolator, and add to it 3 pints of water, heat the solution to boiling, with occasional stirring, then draw off by the stop-cock and add enough Distilled Water through the percolator to make a gallon.

It will readily be seen that this is the most convenient and practical way to make Simple Syrup. It is not only made, but strained or filtered at the same operation, and produces a clear, bright syrup.

If it is desirable to make the syrup (or any syrup) without heat, it may be made in the same manner, simply omitting the heat.

For other purposes Syrup is variously made, as *Flavored Syrup*, for making elegant preparations, *Soda Water Syrup* for making soda water, etc.

3121. Syrupus Acaciæ.

Syrup of Acacia — Syrup of Gum Arabic.

Mucilage of Acacia, . . . 25 parts or 4½ fl.ounces.

Syrup, 75 parts or 12 fl.ounces.

Mix them.

This Syrup should be freshly made when required for use.

The proportion of one part by measure of mucilage to three parts of syrup, although not exactly correct, is accurate enough for making this syrup extemporaneously.

This is used in cough mixtures and as a vehicle for other medicines.

MADE BY WATER-BATH PERCOLATION.

Fenner's Formula.

Acacia, granulated, 3 ounces av.

Sugar, granulated, 24 ounces av.

Oil of Cloves, 10 minims.

Water, enough to make 2 pints.

Dissolve the Acacia by stirring it from time to time in eight ounces of water. When it is dissolved put the sugar in the water-bath percolator and add the solution and four ounces of water to it; heat gently and stir occasionally until the sugar is dissolved, then draw off by the stop-cock and add enough water through the percolator to make two pints of the syrup. Rub the Oil of Cloves with an ounce of the syrup and mix it with the remainder by agitation.

Syrup Acacia made in this manner will keep sweet through the summer.

3122. Syrupus Acidi Citrici.*Syrup of Citric Acid.*

Citric Acid,	8 parts or 150	grains.
Water,	8 parts or 2½	fl.drachms.
Spirit of Lemon,	4 parts or 95	minims.
Syrup,	980 parts or 2	pints.

Mix the Spirit of Lemon with the Syrup contained in a bottle; then add, gradually, the Citric Acid, dissolved in the water, shaking the bottle after each addition until the whole is thoroughly mixed.

This is used chiefly for flavoring.

3123. Syrupus Acidi Hydriodici.*Syrup of Hydriodic Acid.*

Iodine,	10 parts or 190	grains.
Alcohol,	80 parts or 4	fl.ounces.
Syrup,	150 parts or 5	fl.ounces.
Sugar,	500 parts or 22	fl.ounces.
Spirit of Orange,	5 parts or 2	fl.drachms.

Distilled water, sufficient to make 1000 parts or 2 pints.

For directions for making see U. S. P. 1880. As a current of hydrosulphuric acid gas is required to be passed through this preparation during the process of making, it will be made by but few druggists, therefore the directions for making are not here repeated.

This Syrup contains one per cent. of absolute Hydriodic Acid. The dose is a teaspoonful.

3124. Syrupus Allii.*Syrup of Garlic.*

Fresh Garlic, sliced and bruised,	15 parts or 6½	ounces av.
Sugar, in coarse powder,	60 parts or 26	ounces av.
Diluted Acetic Acid,	40 parts or 1	pint.

Macerate the Garlic for four days with ten ounces of Diluted Acetic Acid and express the liquid. Then mix the residue

with the remainder of the Acid and again express until enough additional liquid has been obtained to make the whole, when filtered, measure a pint. Then pour the filtered liquid upon the Sugar contained in a bottle and agitate occasionally until it is dissolved. Keep the Syrup in well stopped, filled bottles in a cool place. This is used in cough and worm medicines.

A Compound Syrup of Garlic is made with Garlic $\frac{1}{2}$ ounce, Aniseed $\frac{1}{2}$ ounce, Elecampane Root 3 drachms, Liquorice Root 2 drachms, macerated with Brandy 24 fl.ounces, and the liquid made into a Syrup with $1\frac{1}{2}$ pound of Sugar.

3125. Syrupus Althæa.

Syrup of Althæa.

This is official in the U. S. and German Pharmacopœias, the formula being about the same in each.

Althæa root, cut, . . . 4 parts or 1 ounce av.

Sugar, granulated, . . . 60 parts or 15 ounces av.

Water, a sufficient quantity to make 100 parts or 1 pint.

Having washed the Althæa with cold Water, pour upon it fourteen ounces of cold Water and macerate for one hour, stirring frequently; then drain through flannel without expressing. To nine fl.ounces of the drained liquid add the Sugar and dissolve it by agitation without heat. This Syrup should be freshly made, when required for use.

This is a demulcent Syrup used for coughs and as a diuretic. Dose, a teaspoonful or more.

3126. Syrupus Amygdalæ.

Syrup of Almonds (Orgeat).

Sweet Almond, . . . 10 parts or 5 ounces av.

Bitter Almond, . . . 3 parts or $1\frac{1}{2}$ ounces av.

Sugar, 50 parts or 25 ounces av.

Orange Flower Water, 5 parts or $2\frac{3}{8}$ fl.ounces.

Water, enough to make 100 parts or 2 pints.

Having blanched the Almonds rub them to a very fine paste, adding, during the trituration, $1\frac{1}{2}$ ounces of Water and 5 ounces of Sugar. Mix the paste thoroughly with the Orange

Flower Water and 15 ounces of Water, strain with strong expression, and add enough Water to the dregs to obtain, after renewed expression, 25 fl.ounces of strained liquid. To this add the remainder of the Sugar, dissolve it by agitation, without heat, and strain through muslin. Keep the Syrup in well-stopped, filled bottles in a cool place. (U. S. 1880.)

The German formula directs a smaller proportion of Bitter Almonds, but is otherwise about the same. It is used mainly for flavoring.

A Syrup of Bitter Almond for flavoring may be made with Essence of Bitter Almond $\frac{1}{2}$ fl.ounce mixed with 1 pint of Syrup.

3127. **Syrupus Aurantii.**

Syrup of Orange.

The U. S. formula is:

Sweet Orange Peel, deprived of the inner white layer, and cut into small pieces, . . .	5 parts or $2\frac{1}{2}$ ounces av.
Alcohol,	5 parts or 3 fl.ounces.
Precipitated Phosphate of Calcium,	1 part or $\frac{1}{2}$ ounce av.
Sugar,	60 parts or 30 ounces av.
Water, a sufficient quantity to make	100 parts or 34 fl.ounces.

Macerate the Orange Peel with the Alcohol for seven days, then express the liquid; rub this with the Precipitated Phosphate of Calcium and 15 ounces of Water gradually added; filter the mixture and pass enough Water through the filter to make the filtrate weigh 40 parts or measure $19\frac{3}{8}$ ounces. Lastly, add the Sugar, dissolve it by agitation, without heat, and strain. Used mainly for flavoring.

The Br. P. directs Tincture of Orange Peel 1 fl.ounce, Syrup 7 fl.ounces, to be mixed together.

The G. P. formula is: Orange Peel 5 parts, White Wine 45 parts, macerate for 2 days and express, then add to 40 parts of expressed liquid 60 parts of Sugar and dissolve.

FENNER'S FORMULA.

As Syrup of Orange is used only for its agreeable flavor, and has no medicinal value, it seems unnecessary to go to so much trouble to make it when a simpler method will answer the purpose as well. The following formula is therefore given, which will make a fine preparation, provided only a good quality of Oil of Orange is used:

Oil of Orange,	40 minims.
Alcohol,	2 fl.drachms.
Carbonate of Magnesium,	80 grains.
Sugar, granulated,	28 ounces av.
Water, sufficient to make	2 pints.

Dissolve the Oil of Orange in the Alcohol and rub with the Carbonate of Magnesium in a mortar, gradually adding 12 fl.ounces of Water; filter the mixture and add enough Water through the filter to make 14 fl.ounces; dissolve the Sugar in the filtrate by agitation or percolation and add enough Water, if necessary, to make 2 pints of the Syrup.

3128. **Syrupus Aurantii Florum.**

Syrup of Orange Flowers.

Sugar, in coarse powder, . 65 parts or 28 $\frac{3}{8}$ ounces av.

Orange Flower Water, 35 parts or enough to make 2 pints.

Dissolve the Sugar as nearly as possible by agitation in 14 fl.ounces of Orange Flower Water, then add enough Orange Flower Water to make 2 pints of the Syrup and agitate until dissolved.

The amount of Sugar directed is a little more than will readily dissolve by agitation. The 1870 revision directs to use gentle heat. It may be readily made to dissolve by water-bath percolation without injuring its flavor.

The formulas of the Br. and German Pharmacopœias direct the Sugar first to be dissolved in distilled Water by heat, and Orange Flower Water added when nearly cold, to make of the desired specific gravity.

This Syrup is used for flavoring other medicines.

3129. Syrupus Calcii Lactophosphatis.*Syrup of Lactophosphate of Calcium (Lime).*

Precipitated Phosphate of

Calcium (Lime), . . . 22 parts or 1 ounce av.

Lactic Acid, concentrated, 33 parts or 9½ fl.drachms.

Orange Flower Water, . . . 80 parts or 3 fl.ounces.

Sugar, in coarse powder, 600 parts or 28 ounces av.

Hydrochloric Acid,

Water of Ammonia, } each a sufficient quantity to make

Water, } 1000 parts or about 2 pints.

Mix the precipitated Phosphate of Calcium with 300 parts or 13 fl.ounces of cold Water and add enough Hydrochloric Acid to dissolve it. Filter the solution and add to the filtrate 1200 parts or 3 pints of cold Water, and Water of Ammonia until slightly in excess, which may be distinguished by the odor of Ammonia after standing a few moments. Allow the precipitate to subside, pour off the supernatant Water, pour on more Water, agitate, and repeat the operation several times until the precipitate is thoroughly washed, then pour it upon a muslin strainer, drain and press out the Water, and, at once, dissolve the magma in the Lactic Acid. Then add the Orange Flower Water and enough Water to make the solution weigh about 350 parts or measure 14 fl.ounces; filter, and pass enough Water through the filter to make the filtrate weigh 400 parts or measure 17 fl.ounces. Lastly, add to this the Sugar and dissolve it by agitation or percolation, without heat, and strain.

This is essentially the same as was formerly published in FENNER'S FORMULARY. The addition of a fl.drachm of Hydrochloric Acid to the finished Syrup tends to prevent the precipitation which is so common in this preparation. In fact, as the Syrup is prepared by many manufacturers, it contains hardly any Lactic Acid, its place being supplied by Hydrochloric Acid, which is cheaper and makes a more stable preparation. This Syrup is given as a nutritive tonic in doses of a teaspoonful or more.

Another formula for this Syrup is given among the Unofficial Syrups.

3130. Syrupus Calcis.*Syrup of Lime — Saccharated Solution of Lime.*

Lime (unslacked), 5 parts or 1 ounce av.
 Sugar, in coarse powder, . 30 parts or 6 ounces av.
 Water, a sufficient quantity
 to make 100 parts or 20 ounces av.

Triturate the Lime and Sugar together in a mortar, then add the mixture to 12 ounces of boiling Water, contained in a bright copper or tinned iron vessel, and boil the mixture for five minutes, constantly stirring; dilute it with an equal volume of Water and filter it through white paper. Finally, evaporate the Syrup to 100 parts or 20 ounces avoirdupois.

This is a new U. S. official, but a similar preparation has been for some time official in the British Pharmacopia under the name of *Liquor Calcis Saccharatus*. It is used as an antacid. Dose, teaspoonful or more.

3131. Syrupus Cerasorum. G. P.*Syrup of Cherries.*

Bruise black sour Cherries with the seeds (stones) and set them aside in a covered vessel at a temperature of about 20°C., stirring frequently until a small filtered portion yields a clear mixture with half its volume of Alcohol; then express and filter. The liquid may be called Cherry Juice. Then take

Cherry Juice, 1 pint or 35 parts.
 Sugar, 2 pounds or 65 parts.

Dissolve the Sugar in the Juice. This is a finely-flavored acid Fruit Syrup. Other Fruit Syrups may be prepared in the same manner.

3132. Syrupus Cinnamomi. G. P.*Syrup of Cinnamon — Zimmet Syrup.*

Cinnamon, in coarse powder, 10 parts.
 Cinnamon Water, 50 parts.
 Sugar, 60 parts.
 Water, 40 parts.

Macerate the Cinnamon in the Cinnamon Water for 2 days, strain and filter, then add the Sugar and dissolve.

This Syrup is used as a flavoring for other medicines.

3133. Syrupus Chloral. Br.

Syrup of Chloral.

Hydrate of Chloral, 80 grains.
 Distilled Water, $1\frac{1}{2}$ fl.drachms.
 Simple Syrup, sufficient to make . . . 1 fl.ounce.

Dissolve the Chloral in the Water and add enough Syrup to make the measure 1 fl.ounce.

This Syrup contains 10 grains of Chloral in a fl.drachm and is used as a hypnotic and anodyne. It should be freshly made when wanted. A teaspoonful contains 10 grains of the salt. The dose is 1 to 4 fl.drachms.

3134. Syrupus Ferri Bromidi.

Syrup of Bromide of Iron.

Iron, in the form of fine
 wire cut in small pieces, 30 parts or $1\frac{1}{2}$ ounces av.
 Bromine, 75 parts or $3\frac{3}{4}$ ounces av.
 Sugar, in coarse powder, 600 parts or 30 ounces av.
 Distilled Water, a sufficient quantity to make 1000 parts or about 2 pints.

Introduce the Iron into a flask of thin glass of suitable capacity, add to it 200 parts or 9 fl.ounces of distilled Water, and afterwards the Bromine; shake the mixture occasionally until the reaction ceases and the solution has acquired a green color and has lost the odor of Bromine. Place the Sugar in a porcelain capsule and filter the solution of Bromide of Iron into the Sugar; rinse the flask and the Iron Wire with 90 parts or 4 fl.ounces of distilled Water and pass the washings through the filter into the Sugar; stir the mixture with a porcelain or wooden spatula, heat it to the boiling point on a sand-bath and, having strained the Syrup through linen into a tared

bottle, add enough distilled Water to make the product weigh 1000 parts or measure 33 fl.ounces. Lastly, shake the bottle and transfer its contents to small vials, which should be well filled, corked, and kept in a cool dark place.

This Syrup, which has previously been furnished chiefly by manufacturing chemists, is now made officinal. It should contain 10 per cent. by weight of Ferrous Bromide. The dose is 15 to 60 minims.

3135. Syrupus Ferri Iodidi.

Syrup of Iodide of Iron.

Iron, in the form of fine	
wire cut in small pieces,	25 parts or 532 grains.
Iodine,	82 parts or 4 ounces av.
Sugar, in coarse powder,	600 parts or 28 ounces av.
Distilled Water, a suffi-	
cient quantity to make	1000 parts or . 2 pints.

Introduce the Iron into a flask of thin glass of suitable capacity; add to it 200 parts or 10 fl.ounces of distilled Water, and afterwards the Iodine; shake the mixture occasionally until the reaction ceases and the solution has acquired a green color, and lost the odor of Iodine. Place the Sugar in a porcelain capsule, and filter the solution of Iodide of Iron into the Sugar. Rinse the flask and Iron Wire with 90 parts or 4 fl.ounces of distilled Water, and pass the washings through the filter into the Sugar. Stir the mixture with a porcelain or wooden spatula, heat it to boiling on a sand bath, and having strained the syrup into a tared bottle, add enough distilled Water to make the product weigh 1000 parts or measure 2 pints. Lastly, shake the bottle, and transfer its contents to small vials, which should be securely corked, and kept in a cool, dark place.

This Syrup contains 10 per cent. of Ferrous Iodide. The Br. and German contain only about 5 per cent. The 1880 preparation contains more Sugar than the 1870, and is therefore a more stable preparation. The dose is 15 to 60 minims.

Many methods have been proposed for preventing the decomposition and change of color of Syrup of Iodide of

Iron, but if carefully made by the present official formula, and preserved as directed, it seldom changes. Should any change be noticeable, a very small crystal of Ferrous Sulphate will generally restore it. A so-called "Tasteless Syrup of Iodide of Iron" (which see) is furnished by manufacturing chemists, and is quite popular with many physicians.

3136. *Syrupus Ferri Oxydati Solubilis.* G. P.

Syrup of Oxide of Iron.

Saccharated Oxide of Iron,	} of each equal parts by weight.
Syrup,	
Water,	

Mix them and dissolve. It contains 1 per cent. of Iron and is given as a mild ferruginous tonic. The dose is a teaspoonful or more.

3137. *Syrupus Ferri Phosphatis.* Br.

Granulated Sulphate of Iron, . . .	224	grains.
Phosphate of Sodium,	200	grains.
Bicarbonate of Sodium,	56	grains.
Concentrated Phosphoric Acid (Br. P.),	1 $\frac{1}{4}$	fl.ounces.
Refined Sugar,	8	ounces av.
Distilled Water,	8	fl.ounces.

Dissolve the salts separately, mix, and wash the precipitate as directed page 37, press the residue and dissolve it in the Phosphoric Acid, filter the solution, add the Sugar, and dissolve, making the measure 12 fl.ounces.

This contains about one grain of Phosphate of Iron in a fl.drachm.

This Syrup is much more readily prepared by mixing

Solution Phosphate of Iron (1936), . .	2 fl.drachms.
Syrup,	15 fl.ounces.

Or, by dissolving Phosphate of Iron in scales 128 grains in 6 fl.ounces hot Water, adding 14 ounces av. of Sugar, and then enough Water to make a pint.

The dose is a teaspoonful or more as an iron tonic.

3138. *Syrupus Ferri, Quininæ et Strychninæ Phosphatum. U. S.*

Syrup of the Phosphates of Iron, Quinine and Strychnine.

Phosphate of Iron (scale salt),	133 parts or 200 grains.
Quinine,	133 parts or 200 grains.
Strychnine,	4 parts or 6 grains.
Phosphoric Acid,	800 parts or 2 fl.ounces.
Sugar, in coarse powder, .	6000 parts or 21 ounces av.
Distilled Water, a sufficient	
quantity to make . . .	10000 parts or 2 pints.

Add the Phosphate of Iron to 2500 parts, or $\frac{1}{2}$ pint of distilled Water in a tared bottle large enough to hold the finished Syrup and agitate freely until the salt is dissolved. Having added the Phosphoric Acid to the solution, triturate the Quinine and Strychnine gradually with the mixture in a mortar until they are dissolved, then return the solution to the bottle and add enough Distilled Water to make the liquid weigh 4000 parts or measure 12 fl.ounces. Lastly, add the Sugar, dissolve it by agitation, without heat, and filter through paper. Keep the Syrup in well-stopped vials in a cool, dark place.

This new official is entirely unlike the unofficial preparations bearing the same name. In making it the new official Phosphate of Iron in scales is to be used, and the alkaloids Quinine and Strychnine; the Phosphoric Acid is also the new official 50 per cent. solution.

The unofficial preparation of this name is more familiarly known as Easton's Syrup, the formula for which is as follows:

3139. *Syrup Phosphates of Iron, Quinine and Strychnine.*

Easton's Syrup.

This preparation has been much used in the past, but is now superseded by the U. S. official syrup. As some druggists may still wish to prepare it, the formula is given:

Sulphate of Iron,	1 $\frac{1}{4}$ ounce av.
Phosphate of Sodium,	1 $\frac{3}{4}$ ounce av.
Quinine (alkaloid),	1 ounce av.
Strychnine (alkaloid),	8 grains.
Phosphoric Acid (1880),	4 fl.ounces.
Sugar,	4 pounds av.
Water, a sufficient quantity.	

Dissolve the Sulphate of Iron and the Phosphate of Sodium each separately in a quart of water, add the Iron solution to the Sodium solution gradually and with constant stirring, and wash the precipitate as directed (page 37) until the washings are tasteless; then collect the precipitate, drain and press quickly, and dissolve in the Phosphoric Acid. Add sufficient Water to the solution to make 36 fl.ounces, dissolve the Quinine and Strychnine in the Solution, filter, and dissolve the Sugar in the filtrate. The dose is a teaspoonful, as a tonic, containing about 1 grain each Iron and Quinine, and $\frac{1}{64}$ grain Strychnine.

3140. Syrupus Hemidesmi. Br.

Syrup of Hemidesmus—(Indian Sarsaparilla).

Hemidesmus Root,	4 ounces av.
Refined Sugar,	28 ounces av.
Boiling Distilled Water,	20 fl.ounces.

Infuse the Hemidesmus Root in the Water in a covered vessel for 4 hours and strain. Set it by till the sediment subsides; then decant the clear liquid, add the sugar and dissolve by aid of a gentle heat. This is used as an alterative and blood purifier. The dose is a teaspoonful.

Syrup of Sarsaparilla of any other kind may be made in the same proportions and manner.

3141. Syrupus Hypophosphitum.

Syrup of Hypophosphites.

The U. S. official formula is:

Hypophosphite of Calcium (Lime),	35 parts or 700 grains.
Hypophosphite of Sodium (Soda),	12 parts or 240 grains.
Hypophosphite of Potas- sium,	12 parts or 240 grains.
Citric Acid,	1 part or 20 grains.
Spirit of Lemon,	2 parts or 48 minims.
Sugar, in coarse powder, .	500 parts or 23 ounces av.
Water, a sufficient quantity to make	1000 parts or 2 pints.

Mix the Hypophosphites and dissolve them by trituration in 350 parts, or one pint, of Water. Should there be any

residue undissolved allow the solution to settle, pour off nearly all of it and add the Citric Acid so that it may be dissolved. Then, having mixed the liquids, add the Spirit of Lemon and filter through paper, adding enough Water through the filter to make the whole weigh 500 parts or measure 21 fl.ounces. In this liquid dissolve the Sugar by agitation or percolation, without heat, and strain. Keep in well-stopped bottles. This is employed as a nutritive and tonic, especially for wasting diseases. The dose is a dessertspoonful.

This Syrup has been in use for many years, under the general title of Syrup of Hypophosphites Compound, or Churchill's Syrup. The title "Syrup of Hypophosphites" seems insufficient, as there are so many combinations called by that general name. Physicians prescribing Syrups of Hypophosphites should state the combination they desire by designating the Hypophosphite Salts, otherwise much confusion will result.

In the officinal formula Citric Acid is used instead of Hypophosphorous Acid, which is usually directed in unofficial formulæ, and which seems more appropriate in the preparation. Formulæ for the various combinations of Hypophosphites in syrups will be found further on in unofficial Syrups.

3142. Syrupus Hypophosphitum cum Ferro.

Syrup of Hypophosphites with Iron.

The U. S. P. formula is:

Lactate of Iron, 1 part or 96 grains.

Syrup of Hypophosphites, . . 99 parts or 1 pint.

Dissolve the Lactate of Iron in the Syrup by trituration, and keep the Syrup in well-stopped bottles.

This Syrup is also a new official, being designed to take the place of the popular unofficial "Syrup of Hypophosphites of Lime, Iron, Soda, and Potassa."

Lactate of Iron is made to take the place of freshly precipitated Hypophosphite of Iron, which has usually been directed in the unofficial formulæ.

This is given as a nutritive tonic in doses of a teaspoonful or more.

3143. Syrupus Ipecacuanhæ.*Syrup of Ipecac.*

The U. S. formula is:

Fluid Extract of Ipecac, . . . 5 parts or 2 fl.ounces.

Syrup, 95 parts or 25 fl.ounces.

Mix them.

The present official Fluid Extract will mix with syrup and make a transparent preparation, because, by the process of preparing it, the resinous matter is removed; but the 1870 Fluid Extract and most manufacturers will make a "muddy" preparation, because of the precipitation of the resin of the Fluid Extract which is held in solution.

The druggist may readily ascertain if his fluid extract contains resin by adding a few drops of it to water. If it contains resin it will have a muddy or cloudy appearance; if free from it, the result will be a clear solution. If it contains resin, the syrup should be made as follows:

Fluid Extract of Ipecac, 2 fl.ounces.

Water, 13 fl.ounces.

Sugar, 28 ounces av.

Mix the Extract with the Water and half of the Sugar, and allow to stand until the Sugar is dissolved, then filter, add the remainder of the Sugar and dissolve by percolation or gentle heat, adding water if necessary to make two pints.

If it is desired to make the Syrup of Ipecac from the root instead of the fluid extract, it may be made by the following formula:

Ipecac, in moderately fine powder, . . . 8 ounces av.

Alcohol, 4 fl.ounces.

Sugar, in coarse powder, 7 pounds av.

Water, a sufficient quantity.

Moisten the Ipecac with the Alcohol and pack moderately in the water-bath percolator: pour upon it 4 ounces of Water and set in a warm place for 24 hours; then heat very moderately and after one hour begin to percolate, adding Water to the drug and continuing the heat and percolation until two

pints have passed. Evaporate this by means of a water-bath — boiling it for a few moments — to a pint, and when cool filter, add to the filtrate enough Water to make 60 fl.ounces and dissolve the Sugar in the liquid by gentle heat, or water-bath percolation. The product should be one gallon of Syrup. Lastly, while still warm, put it in half-pint well-stopped bottles, and set away in a cool place.

Syrup of Ipecac made and preserved in this manner will keep for years. It is given as an emetic in doses of $\frac{1}{2}$ to 1 teaspoonful, repeated in 15 minutes if necessary, and is used in cough remedies.

The German Syrup of Ipecac contains only 1 per cent. of Ipecac. The Br. P. contains no formula for it.

3144. Syrupus Krameriae.

Syrup of Krameria (Rhatany).

Fluid Extract Krameria, . . . 35 parts or 12 fl.ounces.

Syrup, 65 parts or 20 fl.ounces.

Mix them.

As this Syrup is so little used, it is much more convenient to prepare it from the Fluid Extract as required; 3 parts or fl.drachms of the Fluid Extract to 5 parts or fl.drachms of Syrup makes the preparation in the proper proportion.

The dose is a teaspoonful or more as an astringent.

3145. Syrupus Lactucarii.

Syrup of Lactucarium.

Fluid Extract of Lactucarium, . . . 5 parts or 2 fl.ounces.

Syrup, 95 parts or 29 fl.ounces.

Mix them.

This is used as an anodyne in doses of 1 to 3 fl.drachms.

3146. Aubergier's Syrup of Lactucarium.

This preparation is much used in Europe and is occasionally called for in this country. Prof. Proctor, in the

A. J. P. 1866, page 290, furnished the following formula for its preparation :

Lactucarium (German),	½ ounce av.
Sugar, granulated,	1 ounce av.
Syrup,	4½ pints.
Citric Acid, in powder,	60 grains.
Orange Flower Water,	4 fl.ounces.
Diluted Alcohol, } each a sufficient quantity.	
Water, }	

Triturate the Lactucarium with the Sugar until reduced to powder, put it into a funnel-shaped percolator, pour on diluted Alcohol until the Lactucarium is nearly exhausted, or until 10 fl.ounces have passed, evaporate to 2 fl.ounces and add it to the Syrup, previously heated by boiling, and mix. Continue the ebullition slowly until the whole measures 4 pints and 6 fl.ounces. Then add the Citric Acid and strain, and, lastly, when nearly cool, the Orange Flower Water, and mix them.

This preparation is much inferior in strength to the officinal preparation.

3147.

Syrupus Limonis.

Syrup of Lemon.

Lemon Juice, recently ex-	
pressed and strained, . . .	40 parts or 17 fl.ounces.
Lemon Peel, fresh, . . .	2 parts or 1 ounce av.
Sugar, in coarse powder, . .	60 parts or 28 ounces av.
Water enough to make . .	100 parts or 2 pints.

Heat the Lemon Juice to the boiling point, then add the Lemon Peel and let the whole stand closely covered until cold, filter, add enough Water through the filter to make the filtrate measure 17 fl.ounces, dissolve the Sugar in the filtered liquid by agitation, without heat, and strain.

Syrup of Lemon will not keep long during the summer months. It is better preserved if put up hot, in small bottles, and kept in a cool place.

The Br. formula is Lemon Juice 20 fl.ounces, Lemon Peel 2 ounces av., Sugar 2¼ pounds av., made in the same manner.

3148. Syrupus Liquiritiæ. G. P.*Syrup of Liquorice Root.*

Russian Liquorice Root,	20 parts.
Water of Ammonia,	10 parts.
Water,	100 parts.
Alcohol,	10 parts.
Syrup, sufficient to make	100 parts.

Macerate the Liquorice Root in the mixed Water of Ammonia and Water for 10 hours, then express, heat the liquid once to boiling, and evaporate on a steam-bath to 10 parts; to this add the alcohol, set aside for 12 hours, then filter and add to the filtrate enough Syrup to make 100 parts. This is used as a vehicle for bitter medicines and as a demulcent in cough mixtures, etc.

3149. Syrupus Mannæ. G. P.*Syrup of Manna.*

Pure Manna,	10 parts.
Water,	40 parts.
Sugar,	50 parts.

Dissolve the Manna in the Water, filter and dissolve the Sugar in the filtrate. This is slightly laxative.

3150. Syrupus Menthæ. G. P.*Syrup of Peppermint.*

Peppermint, cut,	10 parts.
Alcohol,	5 parts.
Water,	50 parts.
Sugar,	60 parts.

Moisten the Peppermint with the Alcohol, then add the Water, allow to stand one day, strain without pressure, and to 40 parts of the liquid add the Sugar, dissolve by gentle heat and when cold strain or filter.

A great many other Syrups of Aromatic herbs may be prepared in the same manner.

3151. Syrupus Mori. Br.*Syrup of Mulberries.*

Mulberry Juice,	20	fl.ounces.
Refined Sugar,	36	ounces av.
Rectified Spirit,	2½	fl.ounces.

Heat the Juice to the boiling point and when cool, filter. Dissolve the Sugar in the filtered Liquid with the aid of heat and, when cool, add the Spirit. The dose is a fl.drachm or more.

3152. Syrupus Papaveris.

The Br. formula is :

Poppy Capsules freed from the seeds, and in No. 20 powder,	18	ounces av.
Rectified Spirit,	8	fl.ounces.
Refined Sugar,	2	pounds av.
Boiling Distilled Water, a sufficiency.		

Mix the Poppy Capsules with 40 fl.ounces of the Boiling Water and infuse for 24 hours, stirring frequently; then pack in a percolator, and adding some more of the Water, allow the liquid to pass slowly until exhausted, or until about 160 fl.ounces have passed. Evaporate this percolate by water-bath to 44 fl.ounces, and when cold add the Spirit, allow to stand 12 hours, filter, distill off the Spirit, evaporate the remaining liquor to 20 fl.ounces, add the Sugar and dissolve. The dose is 1 fl.drachm as an anodyne, etc.

The German Pharmacopœia directs this to be made the same as Syrup of Peppermint (which see). This is not official in the U. S. P.

3153. Syrupus Picis Liquidæ.*Syrup of Tar.*

Tar,	6 parts or 2½	ounces av.
Cold Water,	12 parts or 5	fl.ounces.
Boiling Distilled Water,	50 parts or 22	fl.ounces.
Sugar, in coarse powder,	60 parts or 26	ounces av.

Upon the Tar contained in a suitable vessel, pour the Cold Water and stir the mixture frequently during 24 hours; then

pour off the water and throw it away. Pour the Boiling Distilled Water upon the residue, stir the mixture briskly for fifteen minutes and set it aside for 36 hours, stirring occasionally. Decant the solution and filter. Lastly, in forty parts, or 17 fl.ounces of filtered solution, dissolve the Sugar by agitation, without heat. U. S.

MADE BY WATER-BATH PERCOLATION.

Fenner's Formula.

Tar,	2 ounces av.
Cold Water,	4 fl.ounces.
Pine Sawdust,	12 ounces av.
Sugar, granulated,	28 ounces av.
Boiling Water, a sufficient quantity.	

Pour the Cold Water upon the Tar and stir the mixture occasionally during 24 hours; then pour off the water and mix the Tar intimately with the Pine Sawdust and pack firmly in the water-bath percolator. Pour upon it a pint of Boiling Water and keep at a moderate heat for 2 hours, then pour on more Boiling Water and begin to percolate, adding water and continuing the heat and percolation until 20 ounces have passed. Allow the percolate to stand until cool, then filter off a pint and dissolve the Sugar in the filtrate, by agitation or percolation. This is much used in cough mixtures, etc.

3154. Syrupus Pruni Virginianæ.

Syrup of Wild Cherry.

1880.

Wild Cherry, in No. 20	
powder,	12 parts or 5½ ounces av.
Sugar, in coarse powder,	60 parts or 28 ounces av.
Glycerin,	5 parts or 2 fl.ounces.
Water, a sufficient quantity to make about	
	2 pints.

Moisten the Wild Cherry thoroughly with Water and macerate for 24 hours in a close vessel, then pack it firmly in a cylindrical glass percolator and gradually pour Water upon it

until 15 ounces of percolate are obtained. Dissolve the Sugar in the liquid by agitation without heat, add the Glycerin and strain. U. S.

MADE BY WATER-BATH PERCOLATION.

Wild Cherry, in No. 20 powder, . . .	5½ ounces av.
Sugar, granulated,	28 ounces av.
Glycerin,	2 fl.ounces.
Water enough to make	2 pints.

Moisten the Wild Cherry with six ounces of Water, and allow it to stand in a warm place for 24 hours in a covered vessel; then pack in the water-bath percolator, pour a pint of Water upon it and heat very moderately, not over 100 F., for one hour, then begin to percolate, and continue the heat and percolation, adding Water to the drug, if necessary, until 14 fl.ounces have passed, dissolve the Sugar in the percolate while still warm, and add the Glycerin. Keep in small, well-stopped bottles in a cool place. Prepared and preserved in this manner this Syrup will keep through the summer.

If the heat is kept within the limit mentioned, a much better preparation will result than when made by the cold process; but too high a degree of heat vaporizes the Hydrocyanic Acid which has been developed by moistening the drug, and injures the preparation.

This Syrup is much used as a sedative in cough remedies.

3155. *Syrupus Rhamni Catharticæ.* G. P.

Syrup of Buckthorn.

This Syrup is officinal in the German Pharmacopœia and is quite frequently called for in this country. It is made from the fresh juice of Buckthorn Berries, which is not obtainable in this country, by dissolving 65 parts of Sugar in 35 parts of the juice. We, therefore, have to depend upon the imported syrup, which can be obtained of wholesale druggists. Fluid Extract and Elixir of Buckthorn made from the Bark or Berries are now extensively used, and have nearly superseded, in this country, the Syrup made from the fresh juice.

3156.

Syrupus Rhei.*Syrup of Rhubarb.*

The U. S. P. formula is:

Rhubarb, sliced, . . .	90 parts or	3 $\frac{7}{8}$ ounces av.
Cinnamon, bruised, . .	18 parts or	340 grains.
Carbonate of Potassium,	6 parts or	112 grains.
Sugar, in coarse powder,	600 parts or	27 ounces av.
Water, a sufficient quantity to make	1000 parts or	2 pints.

Mix the Rhubarb, Cinnamon and Carbonate of Potassium with 420 parts or 20 fl.ounces of Water, and macerate the mixture in a glass or porcelain vessel for twelve hours. Then strain and filter, adding through the dregs, if necessary, enough Water to make the filtered liquid weigh 400 parts or measure a pint. Lastly, add the Sugar, dissolve it by agitation, without heat, and strain.

MADE BY WATER-BATH PERCOLATION.

Rhubarb, in No. 20 powder, . . .	4 ounces.
Cinnamon, in No. 20 powder, . . .	360 grains.
Carbonate of Potassium,	120 grains.
Sugar, granulated,	28 ounces av.
Water, a sufficient quantity.	

Mix the Rhubarb and Cinnamon; dissolve the Carbonate of Potassium in 4 ounces of Water, and, having moistened the drugs with the solution, set in a warm place in a closed vessel for 12 hours, then pack moderately in the water-bath percolator, pour upon them a pint of Water and heat very moderately for one hour; then begin to percolate, adding Water to the drugs if necessary, and continue the heat and percolation until a pint of the percolate has passed; while still warm dissolve the Sugar in the liquid by agitation, and filter.

This will be found much superior to the U. S. process for making this Syrup.

The Br. P. formula is Rhubarb, Coriander, each 2 ounces av., Refined Sugar 24 ounces av., Rectified Spirit 8 fl.ounces, Distilled Water 24 fl.ounces. Percolate with the mixed Spirit and

Water. Evaporate the percolate to 14 fl.ounces, filter, and dissolve the Sugar in the filtrate.

The German formula is very much like the U. S.

Syrup of Rhubarb is much used as a stomachic and for bowel troubles, acting first as a purgative and then as an astringent. The dose is 1 to 4 fl.drachms.

3157. **Syrupus Rhei Aromaticus.**

Aromatic Syrup of Rhubarb—Spiced Syrup of Rhubarb.

The U. S. P. formula of 1870 was:

Rhubarb, in No. 50 powder,	600 grains.
Cloves, in No. 50 powder,	60 grains.
Cinnamon, in No. 60 powder,	60 grains.
Nutmeg, in No. 50 powder,	60 grains.
Syrup,	3 pints.
Diluted Alcohol, a sufficient quantity.	

Mix the powders, and, having moistened the mixture with a fl.ounce of Diluted Alcohol, introduce it into a conical percolator and pour Diluted Alcohol upon it until a half pint of tincture has passed; add this to the Syrup, previously heated, and mix them thoroughly.

The U. S. P. formula of 1880 is:

Aromatic Tincture of Rhubarb,	10 parts or 2 fl.ounces.
Syrup,	90 parts or 14 fl.ounces.

Mix the Aromatic Tincture of Rhubarb with the Syrup.

As the Aromatic Tincture of Rhubarb is the same as is produced by percolating the drugs with Diluted Alcohol in the 1870 formula, the resultant preparation is very nearly the same in both cases. A formula for preparing this Tincture by water-bath percolation will be found under the head of Tinctures.

3158. **Syrupus Rhœados. Br.**

Syrup of Red Poppy.

Fresh Red Poppy Petals,	13	ounces av.
Refined Sugar,	36	ounces av.
Distilled Water,	20	fl.ounces.
Rectified Spirit,	2½	fl.ounces.

Add the petals gradually to the Water heated in a water-bath, frequently stirring, and afterwards, the vessel being removed, infuse for 12 hours, then press out the liquor, strain, add the Sugar and dissolve by heat; when nearly cold add the Spirit and enough Water to make the product weigh 58 ounces av. This is used for imparting a red color to Syrups, and as a mild anodyne. Dose 1 fl.drachm or more.

3159. **Syrupus Rosæ.**

Syrup of Rose.

This Syrup in the 1870 U. S. P. was called *Syrupus Rosæ Gallicæ*, or *Syrup of Red Rose*. It was prepared by percolating 2 troyounces of Red Rose petals with Diluted Alcohol, reserving the first fl.ounce, evaporating the next 5 ounces that passed to 1½ ounces and mixing with 7 ounces of Water; 18 troyounces of Sugar was then dissolved in the liquid by gentle heat, and when cold the first one ounce reserved was added and thoroughly mixed.

The present officinal formula is as follows:

Fluid Extract of Rose, . . . 10 parts or 2 fl.ounces.

Syrup, 90 parts or 14 fl.ounces.

Mix them.

This is used for coloring and flavoring.

The Br. P. directs 2 ounces av. of dried Red Rose Petals to be infused for 2 hours in 20 fl.ounces of Water, then pressed and the liquid heated to boiling, filtered, and 30 ounces of Sugar dissolved in the filtrate.

3160. **Syrupus Rubi.**

Syrup of Rubus (Blackberry).

Fluid Extract of Rubus (Blackberry), . . . 4 fl.ounces.

Syrup, 12 fl.ounces.

Mix them.

The fluid extract designated is made from Blackberry Root. A Syrup of Blackberry for flavoring Soda Water and for other purposes is also made from the fruit.

This is used as an astringent for diarrhœa, etc. Dose a teaspoonful or more.

3161. Syrupus Rubi Idæi.*Syrup of Raspberry.*

The U. S. P. formula is as follows:

Fresh-ripe Raspberries, any convenient quantity.

Sugar, a sufficient quantity.

Reduce the Raspberries to a pulp and let it stand at rest for three days. Separate the juice by pressing and set it aside until it has completely fermented and become clear, and then filter. To each pint of the filtered juice then add 25 ounces av. of Sugar, heat to boiling, avoiding the use of tinned vessels, and strain. Keep the Syrup in well-stopped bottles in a cool, dark place. The G. P. formula is about the same.

This is evidently given as a representative formula for Fruit Syrups, and although it makes a good Syrup it does not retain the natural flavor of the fruit as does a Syrup made from the juice without being fermented. See formulas for Fruit Syrups.

3162. Syrupus Sarsaparilla Compositus.*Compound Syrup of Sarsaparilla.*

Sarsaparilla, 150 parts or 25 ounces av.

Guaiacum Wood, 20 parts or 3 1/3 ounces av.

Pale Rose, 12 parts or 2 ounces av.

Liquorice Root, 12 parts or 2 ounces av.

Senna, 12 parts or 2 ounces av.

Sassafras, 6 parts or 1 ounce av.

Anise, 6 parts or 1 ounce av.

Gaultheria, 6 parts or 1 ounce av.

Sugar, 600 parts or 100 ounces av.

Water,) each, sufficient to make

Diluted Alcohol, { 1000 parts or about 7 pints.

(The drugs should all be about No. 30 powder.)

Mix the solid ingredients except the Sugar with three pints of Diluted Alcohol and macerate the mixture for forty-eight hours; then transfer it to a cylindrical percolator, pack it firmly, and gradually pour Diluted Alcohol upon it until 6 pints of tincture have been obtained. Evaporate this portion, by means of a water-bath, to 3 pints, add a pint of Water, and filter, adding enough Water through the filter to make 4 pints.

Lastly, add the Sugar, dissolve it by agitation, without heat, and strain. U. S. 1880.

Other formulas for Syrup Sarsaparilla Compound will be found among the Standard Remedies.

MADE BY WATER-BATH PERCOLATION.

Sarsaparilla, in No. 30 powder, . . .	25	ounces av.
Guaicum Wood, in No. 30 powder, . . .	3	ounces av.
Pale Rose, in No. 30 powder, . . .	2	ounces av.
Liquorice Root, in No. 30 powder, . . .	2	ounces av.
Senna, in No. 30 powder,	2	ounces av.
Sassafras, in No. 30 powder,	1	ounce av.
Anise, in No. 30 powder,	1	ounce av.
Sarsaparilla Flavoring (see below), . . .	$\frac{1}{2}$	fl.ounce.
Sugar, in coarse powder,	$6\frac{1}{2}$	pounds av.
Water,	} each, a sufficient quantity.	
Diluted Alcohol,		

Mix the solid ingredients, except the Sugar, and moisten them with $1\frac{1}{2}$ pints of Diluted Alcohol, set in a covered vessel in a warm place for 12 hours, then transfer to the water-bath percolator, pack moderately, pour upon them 2 pints of Diluted Alcohol and set in a warm place for 24 hours; then heat moderately, and after one hour begin to percolate, adding Diluted Alcohol to the drugs and continuing the heat and percolation until 6 pints of the tincture have passed. Distill off three pints of Alcohol, by means of the water-bath and still, add a pint of Water to the residue and filter, adding enough Water through the filter to make the measure 4 pints. Mix the Sarsaparilla Flavoring with 4 ounces of the Sugar and dissolve this with the remainder of the Sugar in the liquid by percolation or agitation.

Sarsaparilla Flavoring, or *Essence of Sarsaparilla*, is the same as is used for flavoring Soda Water Syrups, and is made as follows:

Oil of Wintergreen,	4 fl.drachms.
Oil of Sassafras,	3 fl.drachms.
Oil of Anise,	1 fl.drachm.
Cologne Spirit,	12 fl.ounces.
Water,	4 fl.ounces.

Mix, and, if necessary, filter through a little Carbonate of Magnesium.

3163. **Syrupus Scillæ.**

Syrup of Squill.

The U. S. P. formula is as follows:

Vinegar of Squill, . . .	40 parts or 1 pint.
Sugar, in coarse powder, .	60 parts or 26 ounces av.
Water, sufficient to make	100 parts or 2 pints.

Heat the Vinegar of Squill to the boiling point in a glass or porcelain vessel and filter while hot, adding enough Water through the filter to make the filtrate weigh 40 parts or measure a pint; add the Sugar, dissolve it by agitation, without heat, and strain.

The Br. formula is about the same. This is used for coughs, in doses of $\frac{1}{2}$ to a teaspoonful.

3164. **Syrupus Scillæ Compositus.**

Compound Syrup of Squill (Hive Syrup).

The U. S. P. formula is:

Squill,	120 parts or 2½ ounces av.
Senega,	120 parts or 2½ ounces av.
Tartrate of Antimony and	
Potassium,	3 parts or 28 grains.
Sugar,	1200 parts or 26 ounces av.
Precipitated Phosphate	
of Calcium,	9 parts or 90 grains.
Diluted Alcohol, }	each sufficient to make
Water, }	2000 parts or 2 pints.

The drugs should be in No. 30 powder.

Mix the Squill and Senega, and, having moistened the mixture with half a pint of Diluted Alcohol, macerate for an hour, then transfer the mixture to a conical percolator and gradually pour upon it Diluted Alcohol until one and a half pints of tincture are obtained. Boil this portion for a few minutes and then evaporate it by means of a water-bath to half a pint, having added three ounces of boiling Water, triturate the mixture with the precipitated Phosphate of Calcium, and add,

through the filter, enough warm Water to make the whole measure one pint. In this dissolve the Sugar by agitation, without heat, and strain. Lastly, dissolve the Tartrate of Antimony and Potassium in a fl.ounce of hot Water, and mix the solution thoroughly with the Syrup. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Squill, in No. 20 powder,	2½ ounces av.
Senega, in No. 30 powder,	2½ ounces av.
Tartrate of Antimony and Potassium, 32	grains.
Sugar,	28 ounces av.
Diluted Alcohol, }	each, sufficient.
Water, }	

Mix the Squill and Senega, moisten with 5 fl.ounces of Diluted Alcohol, and set in a covered vessel for 12 hours; then transfer to the water-bath percolator, pack very moderately, pour upon it a pint of Diluted Alcohol, and set in a warm place for 24 hours; then heat very moderately, and after one hour, begin to percolate, adding Water to the drug and continuing the heat and percolation until a pint and a half of the percolate has passed. Distill off 12 fl.ounces of Alcohol, and boil the residue for 15 minutes; then evaporate it to half a pint and filter, adding enough Water through the filter to make 15 fl.ounces. In this dissolve the Sugar by percolation or agitation, and having dissolved the Tartrate of Antimony and Potassium in an ounce of hot Water, add to the Syrup and mix thoroughly.

This is much used as a cough Syrup and emetic, in doses of ½ to a teaspoonful or more.

3165. Syrupus Senegæ.

Syrup of Senega — 1880. *Syrup of Seneka* — 1870.

The U. S. P. 1880 formula is:

Fluid Extract of Senega, .	160 parts or 8 fl.ounces.
Water of Ammonia, . .	4 parts or 90 minims.
Sugar, in coarse powder, .	600 parts or 28 ounces av.
Water, sufficient to make	1000 parts or 2 pints.

Mix the Fluid Extract with 12 ounces of Water, add the Water of Ammonia, shake the mixture well, and let it stand

for a few hours ; then filter, adding enough Water through the filter to make 17 fl.ounces. To the filtered solution add the Sugar and dissolve by agitation or percolation, without heat, and strain. This contains 16 per cent of Senega.

The G. P. preparation contains only 5 per cent. of Senega.

MADE BY WATER-BATH PERCOLATION.

Senega, in No. 40 powder, . . .	8	ounces av.
Diluted Alcohol,	1	pint.
Water of Ammonia,	1 ½	fl.drachm.
Sugar,	28	ounces av.
Water, a sufficient quantity.		

Moisten the drug with 8 fl.ounces of Diluted Alcohol and let stand for 12 hours, then pack moderately in the water-bath percolator ; pour upon it the remainder (8 fl.ounces) of the Diluted Alcohol and set in a warm place for one day ; then heat very moderately, and after one hour begin to percolate, adding Water to the drug, and continuing the heat and percolation until a pint of the tincture has passed ; boil this for 15 minutes to coagulate the albumen and starchy matter, continue the evaporation by gentle heat until the liquid is reduced to half a pint, and filter through muslin, without pressure, adding a little Water through the filter to preserve the measure. To the filtered liquid add 8 ounces of Water and the Water of Ammonia, and, after standing 3 or 4 hours, filter through paper and dissolve the Sugar in the filtrate by agitation or percolation.

This is a tonic expectorant much esteemed in cough mixtures. Dose ½ to 1 fl.drachm.

3166. Syrupus Sennæ.

Syrup of Senna.

The U. S. P. 1880 formula is :

Senna, bruised,	33	parts or 16 ounces av.
Sugar, in coarse powder, . .	60	parts or 29 ounces av.
Alcohol,	4	parts or 2 fl.ounces.
Oil of Coriander,		8 minims.
Water, a sufficient quantity.		

Digest the Senna in five pints of Water, at a temperature not exceeding 50° C. (122° F.), for 24 hours, express and strain the liquid; digest the mass with 2 pints of Water, at the same temperature, for 24 hours, express and strain as before, mix the strained liquids and evaporate the mixture to 15 fl.ounces. When cold add the Alcohol, previously mixed with the Oil of Coriander, and filter through paper, adding, through the filter, enough Water to make the whole measure 17 fl.ounces. Then add the Sugar, dissolve it by agitation or percolation, and strain.

As this Syrup is about one-half the strength of the Fluid Extract, it seems an unnecessary officinal. It may be made extemporaneously by mixing equal measure of Fluid Extract of Senna and Syrup.

It may also be made by water-bath percolation.

The Br. P. formula is about the same. The G. P. preparation contains only 10 per cent. of Senna. The dose as a laxative is 1 to 4 fl.drachms.

3167. **Syrupus Tolutanus.**

Syrup of Tolu.

As the U. S. P. 1870 formula for Syrup of Tolu is generally preferred, both that and the 1880 formula are given.

U. S. P. 1870 FORMULA.

Tincture of Tolu (U. S. 1870),	2 fl.ounces.
Carbonate of Magnesium,	120 grains.
Sugar, in coarse powder,	28½ ounces av.
Water,	1 pint.

Rub the Tincture of Tolu first with the Carbonate of Magnesium and 2 ounces of the Sugar, and then with the Water, gradually added, and filter. To the filtered liquid add the remainder of the Sugar, and, having dissolved it with the aid of a gentle heat, strain the solution while hot.

U. S. P. 1880 FORMULA.

Balsam of Tolu,	4 parts or 13¼ ounces av.
Sugar, in coarse powder, . .	65 parts or 28 ounces av.
Distilled Water, a sufficient quantity.	

Mix the Sugar with 13 fl.ounces of Distilled Water, add the Balsam and digest the whole in a covered vessel, at a temperature not exceeding 82° C. (180° F.), for 2 hours. When cold, strain through a well-wetted muslin strainer, adding enough Water through the strainer to make the Syrup measure 2 pints, and mix thoroughly.

The formula of 1870 is much to be preferred, both on account of the manner of making and the quality and appearance of the finished Syrup.

The Br. P. formula is about the same as the U. S. 1880.

3168. **Syrupus Zingiberis.**

Syrup of Ginger.

As the Syrup of Ginger of the U. S. P. 1870 and 1880 differ considerably, both formulas are given, the 1870 formula being generally preferred.

U. S. P. 1870 FORMULA.

Fluid Extract of Ginger,	3 fl.drachms.
Carbonate of Magnesium,	60 grains.
Sugar, in coarse powder,	26 ounces av.
Water,	1 pint.

Rub the Fluid Extract of Ginger with the Carbonate of Magnesium and 2 ounces of the Sugar, and then with the Water, gradually added, and filter. To the filtrate add the remainder of the Sugar, and, having dissolved it with the aid of gentle heat, strain the solution while hot.

U. S. P. 1880.

Fluid Extract of Ginger,	2 parts or 1 fl.ounce.
Sugar, in coarse powder,	65 parts or 30 ounces av.
Water, a sufficient quantity.	

Rub the Fluid Extract of Ginger with 12 ounces of Sugar and expose the mixture to a heat not exceeding 60° C. (140° F.) until all the Alcohol has evaporated. Then mix the residue thoroughly by agitation with 15 ounces of Water and filter the liquid, adding through the filter enough Water to make the whole measure 22 fl.ounces. Finally, add the remainder of the Sugar, dissolve it by agitation, without heat, and filter.

As with Syrup of Tolu, the 1880 formula is no improvement over the 1870, in fact makes a much less desirable preparation and takes more time and trouble.

The 1870 formula may be made without the use of heat, by percolation or agitation.

The Br. P. formula is strong Tincture of Ginger 6 fl.drachms, Syrup 19 fl.ounces. This is used as a stimulant and stomachic, in doses of 1 or 2 fl.drachms.

Unofficial Syrups.

Besides the foregoing syrups official in the U. S., Br. and German Pharmacopœias, a great many which are not official are much used. These include the syrups of vegetable substances which are popular or convenient; the syrups of chemical substances, which are mostly included in the preparations of elegant pharmacy; syrups used for soda water and other beverages, and a great variety of other syrups which have been introduced into pharmacy and medicine, because of their value, utility or application. The following are those most used:

Syrups of Vegetable Substances.

These syrups are arranged in classes according to their methods of preparation, medicinal strength, etc.

3169. Syrup Adiantum or Maiden Hair.

Maiden Hair Fern,	1 ounce av.
Boiling Water,	10 fl.ounces.
Sugar,	17 ounces av.

Pour the Boiling Water on the drug and infuse for half an hour, then strain, and dissolve the Sugar in 9 fl.ounces of the liquid.

This is used for coughs, etc.; the dose being from a teaspoonful to a tablespoonful. It is also known as *Syrup Capillaire*. It may be flavored with orange flower or other aromatic water.

3170. Syrup Carrageen or Iceland Moss.—Soak first in Water, and pour off to deprive of bitterness. Then make as above.

3171. Syrup Corsican Moss, or Helminthocortus. Make as above.

3172. Syrup Liquorice Root, or Glycyrrhiza, and of other similar substances which make demulcent syrups are prepared in the same manner.

3173. Syrup Aniseed.

Aniseed in coarse powder,	2 ounces av.
Boiling Water,	12 fl.ounces.
Sugar,	17 ounces av.

Pour the boiling Water on the drug and infuse by gentle heat in a covered vessel for two hours, then strain and in 10 fl.ounces of the strained infusion dissolve the Sugar. This is a representative of a great number of aromatic syrups that may be made from seeds, fruit, and other substances. The following Syrups are made in the same manner :

- 3174. Syrup Caraway or Carum.
- 3175. Syrup Cardamom or Cardamomum.
- 3176. Syrup Cloves or Carophylles.
- 3177. Syrup Coltsfoot or Tussilagino.
- 3178. Syrup Cubeb or Cubebæ.
- 3179. Syrup Eucalyptus, Eucalyptus Globulus.
- 3180. Syrup Fennel or Fœniculum.
- 3181. Syrup Gillinia.
- 3182. Syrup Hyssop or Hyssopus.
- 3183. Syrup Juniper Berries.
- 3184. Syrup Sweet Flag or Calamus.
- 3185. Syrup Violets.— Fresh flowers 8 ounces ; dried, 2 ounces.

3186. Syrup Anthemis.*Syrup of Chamomile.*

Chamomile Flowers,	1 ounce av.
Boiling Water,	12 fl.ounces.
Sugar,	17 ounces av.

Pour the Boiling Water upon the drug and infuse for two hours in a covered vessel, then strain and in 9 fl.ounces of the strained infusion, dissolve the sugar.

This is representative of a great many syrups that may be prepared from herbs, flowers, leaves, roots, barks, etc.

The following syrups may be prepared in a similar manner :

- 3187. Syrup Bark or Chinchona.
- 3188. Syrup Bayberry Bark.
- 3189. Syrup Blackberry Root or Rubus.
- 3190. Syrup Bloodroot or Sanguinaria.
- 3191. Syrup Colchicum.
- 3192. Syrup Dulcamara or Bitter Sweet.
- 3193. Syrup Galls or Nutgalls.
- 3194. Syrup Hoarhound or Marrubium.
- 3195. Syrup Jalap.
- 3196. Syrup Lobelia.

3197. Syrup Pipsissewa or Chimaphila.
 3198. Syrup Saffron.
 3199. Syrup Valerian.
 3200. Syrup Vanilla, and many others.

3201. Syrup Asparagus.

Asparagus Juice, clarified,	9 fl.ounces.
Sugar,	17 fl.ounces.

The juice is first clarified by heating almost to boiling and straining. The Sugar is then dissolved in 9 fl.ounces of the clarified juice by gentle heat.

Other syrups are prepared from fresh juices of succulent plants in a similar manner. The following are made in this manner :

3202. Syrup Fumitory.
 3203. Syrup Hounds Tongue.
 3204. Syrup Hedge Mustard.
 3205. Syrup Symphytic.—Comfrey Juice and Plantain Juice each equal parts with Sugar, as above.

3206. Syrup Asafetida.

Asafetida, in powder,	1 ounce av.
Carbonate of Magnesium,	6 drachms.
Boiling Water,	10 fl.ounces.
Essence of Peppermint,	1 fl.ounce.
Sugar,	16 ounces av.

Rub the Asafetida with the Carbonate of Magnesium in a mortar and add the Boiling Water ; when cool add the Essence of Peppermint, filter, adding water enough through the filter to make 9 fl.ounces, and dissolve the Sugar in the filtrate by agitation.

Other syrups may be prepared from gum-resins, balsams, etc., in the same manner, omitting the Essence of Peppermint.

3207. Syrup Ammoniac.
 3208. Syrup Balsam Peru.
 3209. Syrup Benzoin.
 3210. Syrup Canada Balsam.
 3211. Syrup Copaiba.
 3212. Syrup Guaiacum.
 3213. Syrup Liquidambar or Sweet Gum.

3214. Syrup Belladonna.

Fluid Extract Belladonna,	1 fl.ounce.
Water,	8 fl.ounces.
Sugar,	17 ounces av.

Mix the fluid extract with the water, filter and dissolve the Sugar in the filtrate.

This is representative of a great many syrups that may readily be made from fluid extracts in this manner, such as :

- 3215 Syrup Digitalis or Foxglove.
- 3216. Syrup Guarana or Pauliniæ.
- 3217. Syrup Hydrastis or Golden Seal.
- 3218. Syrup Hyoscyamus or Henbane.
- 3219. Syrup Stramonium or Datura,

and many others of similar strength and character.

Syrups may be made from less active drugs by taking

Fluid Extract of Drug,	2 fl.ounces.
Water,	7 fl.ounces.
Sugar,	17 ounces av.

and making a syrup in the same manner as the foregoing.

3220. Syrup Opium.

Aqueous Extract of Opium,	128 grains.
Water, warm,	9 fl.ounces.
Sugar,	17 ounces av.

Rub the extract with the water until dissolved, filter and dissolve the Sugar in the filtrate. Dose, from half to a teaspoonful.

Many other syrups of Extracts may be made in the same manner, using such a quantity of the extract that a teaspoonful will contain the ordinary dose of the medicine.

The following are examples :

- 3221. Syrup Conium, 128 grains extract in a pint.
- 3222. Syru Coca or Erythroxylon 1 ounce extract in a pint.
- 3223. Syrup Euonymus $\frac{1}{2}$ ounce extract in a pint.
- 3224. Syrup Liquorice Extract, 1 ounce extract in a pint.
- 3225. Syrup Taraxacum or Dandelion, 2 ounces extract in a pint.

Many others may be made in a similar manner.

3226. Syrup Svapnia.

Svapnia,	128 grains.
Hot Water,	9 fl.ounces.
Sugar,	17 ounces av.

Rub the Svapnia to a fine powder and dissolve in the Hot Water, filter the solution and dissolve the Sugar in the filtrate. Dose, a half to a teaspoonful.

Svapnia is a proprietary preparation of purified opium made by evaporating a purified solution of opium and pouring upon glass. It is used for the same purposes as Opium.

Compound Vegetable Syrups.

The following are the principal unofficial Compound Vegetable Syrups :

3227. Antiscrobutic Syrup.—Scurvygrass, Watercresses, Horseradish, fresh, of each, 10 ounces; Buckbean 1 ounce, Bitter Orange 2 ounces, Cinnamon $\frac{1}{2}$ ounce, White Wine 45 fl.ounces. Macerate 2 days, then distill off 10 ounces av. and add to the distillate 25 ounces av. of Sugar. Strain the residue left after distilling, clarify with White of Egg, and add to the syrup prepared from the distillate. Dose, 2 to 4 drachms.

3228. Syrup Aralia Compound—*Alterative Syrup*.—This may be made by mixing

Fluid Extract Spikenard Compound (1615), 4 fl.ounces.

Syrup, 12 fl.ounces.

or by making an extract of the ingredients as directed (1615), distilling off the Alcohol and making 4 pints of syrup with Sugar and Water. This is the *Eclectic Syrup Aralia or Spikenard Compound*, much esteemed as an alterative. The dose is from a teaspoonful to a tablespoonful.

3229. Syrup Artemisia Compound—*Syrup of Mugwort Compound*.—Fresh tops of Mugwort, Pennyroyal, Catnip and Savine, each 2 ounces av.; fresh roots of Elecampane, Lovage, and Fennel, each 88 grains; fresh tops of Marjoram, Hyssop, Rue, Feverfew, and Basil, of each 1 ounce av.; Aniseed $\frac{1}{4}$ ounce, Cinnamon $\frac{1}{4}$ ounce, Rectified Spirit 3 ounces, Water 30 ounces, Syrup of Honey 12 $\frac{1}{2}$ ounces av. Infuse the plants with the Water and spirit, and after standing 24 hours distill over 4 fl.ounces, press the residue, clarify the liquid with White of Egg, add Sugar, 25 ounces av., make into a syrup, add the Syrup of Honey, and lastly the distilled liquid, and strain. The dose is 2 to 8 drachms as an aromatic tonic and bitter.

3230. Syrup Asarum Compound.—Macerate 1 $\frac{1}{2}$ ounce av. of Asarum (Canada Snakeroot or Wild Ginger), with 10 fl.ounces of Diluted Alcohol. Pour off the liquid and reserve. Then add 4 fl.ounces of Water, macerate and express, adding the liquid to the portion reserved. To this add 40 grains Cochineal in powder, 75 grains Carbonate of Potassium, Wine of Ipeçac 1 fl.ounce, and 28 ounces of Sugar, dissolve and strain. This is used in cough mixtures, and as a fine aromatic. Dose, a teaspoonful or more.

3231. Syrup Blackberry Aromatic.—This syrup may be made by mixing:

Fluid Extract of Blackberry Aromatic (1581), 2 fl.ounces.

Syrup, 14 fl.ounces.

Or by making an extract of the ingredients as directed (1615), distilling off the Alcohol and making 1 gallon of syrup with Sugar and Water. It may also be made by adding 2 fl.ounces of Fluid Extract of Blackberry and $\frac{1}{4}$ ounce Fluid Extract of Aromatics to 14 fl.ounces of syrup.

3232. Syrup Carrageen Compound—*Compound Syrup of Iceland Moss*.—Pour Cold Water on $\frac{1}{2}$ ounce of Iceland Moss and let stand 12 hours,

then pour off and throw away. Boil Hoarhound $\frac{1}{2}$ ounce, Liverwort $\frac{1}{2}$ ounce and the softened Carrageen with 1 pint of Water for 20 minutes or more, then strain 12 fl.ounces and dissolve in the liquid 24 ounces av. of Sugar. This is an excellent demulcent cough syrup. Dose, a teaspoonful or more.

3233. Syrup Ceanothus Compound — *Compound Syrup of Red-root.*— Tops and leaves of Red-root or Ceanothus, Wild Lettuce, each 1 ounce av.; Cimicifuga $\frac{1}{2}$ ounce, Pleurisy Root, Wild Ginger Root, each $\frac{1}{4}$ ounce; Lobelia, Bloodroot, each 1 drachm. Make an extract with Diluted Alcohol, distill off the Alcohol and make 2 pints of syrup with the residue, Sugar and Water.

This is used as a cough remedy. The dose is a teaspoonful or more.

3234. Syrup Corydalis Compound.

Compound Syrup of Turkey Corn.

Turkey-corn Tubers,	10	ounces av.
Twin Leaf (Jeffersonia Diphylla),	5	ounces av.
Blue Flag,	2½	ounces av.
Sheep Laurel Leaves,	2½	ounces av.
Sugar,	6	pounds av.
Alcohol, Water, each sufficient.		

Reduce the drugs to a coarse powder and cover them with Alcohol. Macerate for 24 hours, then put in the water-bath percolator. Draw off the Alcoholic tincture, and reserve. Continue the percolation with Water until exhausted. Evaporate the last portion of the percolate to a thin extract, add the reserved percolate and enough Water to make the measure 5 pints, after standing, filter, and dissolve the Sugar in the filtrate by percolation or very gentle heat.

This syrup is much esteemed by the Eclectics as an alterative and diuretic for scrofula, syphilis, etc. The dose is a teaspoonful or more.

3235. Syrup Liquorice Compound.

Compound Syrup of Glycyrrhiza.

Liquorice Root, in coarse powder,	2	pounds av.
Marshmellow Root, cut,	8	ounces av.
Sugar,	6	pounds av.
Alcohol, Water, each sufficient.		

Macerate the drugs with Warm Water enough to cover them well, pouring off the liquid after standing a few hours, and repeating the operation until one gallon is obtained, evaporate to 4 pints, strain, add one pint of Alcohol, and dissolve the Sugar in the liquid by percolation or gentle heat.

This is an excellent demulcent syrup for coughs, etc., and a vehicle for quinine without any objectionable qualities.

3236. Syrup Marrubium Compound.*Compound Syrup of Hoarhound — Pulmonary Syrup.*

This may be made by mixing 3 fl.ounces of Fluid Extract of Hoarhound Compound (1597), with 6 fl.ounces of Water, filtering and dissolving in the filtrate 14 ounces av. of Sugar, or by making an extract from the drugs directed for making the fluid extract (1597), and making with it, by the addition of Sugar and Water, 5 ½ pints of Syrup.

This is an excellent tonic cough syrup for pulmonary affections. The dose is a teaspoonful.

3237. Syrup Mitchella Compound.*Compound Syrup of Partridgeberry or Squaw Vine — Mother's Cordial.*

This may be made by mixing 3½ fl.ounces of Fluid Extract Mitchella Compound (1605) with 6 fl.ounces of Water, filtering and dissolving in the filtrate 14 ounces av. of Sugar, or by making an extract of the drugs as directed in the formula (1605), and by the addition of Water and Sugar, making 5 pints of syrup.

This syrup is an Eclectic preparation much esteemed as a parturient and uterine tonic. The dose is a teaspoonful to a tablespoonful.

3238. Syrup Opium and Ipecac.*Dover's Syrup.*

This may be prepared in several ways, all amounting to the same. The following are the most expedient :

Fluid Extract of Ipecac,	128 minims.
Aqueous Extract of Opium,	75 grains.
Syrup,	1 pint.

Rub the Extract of Opium with the fluid extract and a portion of the syrup until dissolved, then add the remainder of the syrup. Or by mixing

Deodorized Tincture of Opium,	2⅔ fl.ounces.
Fluid Extract Ipecac,	128 minims.
Syrup, sufficient to make	1 pint.

This syrup contains the equivalent of 10 grains of Dover's Powder in a teaspoonful or fl.drachm, the usual dose.

3239. Syrup Phytolacca Compound.*Compound Syrup of Poke.*

This may be made by mixing 3 fl.ounces Fluid Extract of Poke Compound (1607) with 6 fl.ounces of Water, filtering and dissolving 14 ounces av. of Sugar in the filtrate, or by making an extract of the drugs directed (1607), and with Water and Sugar making 5½ pints of syrup.

This is an Eclectic Syrup used as an alterative. The dose is a teaspoonful or more.

3240. Syrup Rhubarb and Potassium.*Neutralizing Cordial.*

Rhubarb in very coarse powder,	5	ounces av.
Bicarbonate of Potassium,	5	ounces av.
Golden Seal, in coarse powder,	2	ounces av.
Cinnamon, in fine powder,	2	ounces av.
Oil of Peppermint,	30	minims.
Alcohol,	1½	pint.
Sugar,	6	pounds av.
Water, a sufficient quantity.		

Pack the drugs loosely in the water-bath percolator and having mixed the Alcohol with a pint and a half of Water, pour enough of the liquid on them to saturate and cover them. Let stand for 24 hours, and having dissolved the Bicarbonate of Potassium in the remainder of the liquid pour it upon the drugs; heat very moderately, and after an hour begin to percolate, reserving all that will pass. Remove the heat and continue the percolation with water until the drugs are exhausted. Evaporate this latter portion to 2½ pints. Dissolve the Oil of Peppermint in the portion first reserved, add the evaporated portion and enough Water to make 5 pints, filter and dissolve the Sugar in the filtrate.

This is a valuable Eclectic preparation, much used for dyspepsia and acid stomach. The dose is a teaspoonful to a tablespoonful.

3241. Syrup Rumex Compound.*Compound Syrup of Yellow Dock—Scrofulous Syrup.*

This may be made by mixing 5 fl.ounces Fluid Extract Rumex Compound (1610) with 5 fl.ounces of Water, filtering and dissolving in the filtrate 14 ounces av. of Sugar.

Or by making an extract of the drugs directed (1610), and with Water and Sugar making 4 pints of syrup.

This is an Eclectic syrup much esteemed as a blood-purifier, alterative, etc. The dose is a teaspoonful to a tablespoonful. Iodide of Potassium may be added 1 or 2 drachms in a pint, if desired.

3242. Syrup Stillingia Compound.*Compound Syrup of Queen's Root.*

This may be prepared by mixing 4 fl.ounces of Fluid Extract of Stillingia Compound (1617) with 5 fl.ounces of Water, filtering and dissolving in the filtrate 14 ounces av. of Sugar, or by making an extract from the drugs directed (1617) and with Water and Sugar making 4 pints of syrup.

This is a valuable alterative syrup and blood-purifier first introduced by the "Eclectics." It is much more effective than Syrup Sarsaparilla Compound, and is given in scrofula, syphilis, etc. The dose is a teaspoonful to a tablespoonful. Iodide of Potassium may be added if desired.

3243. Syrup Yerba Santa Compound or Aromatic.

Yerba Santa, coarsely ground,	4	ounces av.
Orange Peel, in coarse powder,	$\frac{1}{2}$	ounce av.
Cinnamon, in powder,	60	grains.
Cloves, in powder,	60	grains.
Magnesia, Calcined,	$\frac{3}{4}$	ounce av.
Sugar,	28	ounces av.
Alcohol, {	of each sufficient to make,	
Water, }		
	2	pints.

Mix one part of Alcohol by measure with 7 parts of Water. Mix the drugs with the Magnesia, moisten with sufficient of the mixed Water and Alcohol and pack in the water-bath percolator, cover with the menstruum and allow to stand 24 hours. Then heat very moderately and begin to percolate, adding the menstruum and continuing the percolation until a pint is obtained, filter this, adding a little more magnesia to the filter if necessary to make clear, and dissolve the Sugar in the filtrate by gentle heat or by percolation.

This syrup is one of the best known vehicles for quinine, as it almost entirely masks its bitterness. It may also be used for bronchial affections.

Syrups of Chemical Substances.

The following are unofficial syrups prepared from chemical substances, for which there is a demand in this country, most of them being known as elegant pharmaceutical preparations. They are, therefore, given more prominence than other unofficial syrups. A great number used in French pharmacy cannot be mentioned here.

3244. Flavored Syrup.

For making syrups of chemical substances as well as for other uses, a flavored simple syrup, which may be used in the same manner as the official simple syrup, is desirable. The following will be found suitable for this purpose :

Elixir Flavoring (508),	1	fl.ounce.
Carbonate of Magnesium,	$\frac{1}{2}$	ounce av.
Water,	4	pints.
Sugar,	8	pounds av.

Rub the Elixir Flavoring with the Carbonate of Magnesium in a mortar, add about one-third of the Water gradually, and

rub them well together; add the mixture to the remainder of the Water, and after standing a day or two, filter and dissolve the Sugar in the filtrate, by percolation or agitation.

3245. Syrup Bromide of Iron (Tasteless.)

Besides the official syrup Bromide of Iron (3134) a so-called tasteless syrup is made as follows:

Bromide of Iron,	384	grains.
Citrate of Potassium,	1½	ounce av.
Soluble Flavoring (510),	1	fl.ounce.
Water,	7	fl.ounces.
Sugar,	16	ounces av.

Dissolve the Citrate of Potassium in the Water, add the Bromide of Iron and then the Soluble Flavoring, and filter. Dissolve the Sugar in the filtrate.

A fl.drachm contains 3 grains Bromide of Iron. Dose 20 to 60 minims.

3246. Syrup Bromide of Morphine.

Bromide of Morphine,	16	grains.
Flavored Syrup,	1	pint.

Dissolve the Morphine in $\frac{1}{4}$ ounce of Warm Water, and add to the syrup.

A fl.drachm contains $\frac{1}{8}$ grain Bromide of Morphine. Dose a teaspoonful.

3247. Syrup Bromide of Quinine.

Bromide of Quinine,	128	grains.
Water,	8	fl.ounces.
Soluble Flavoring (510),	1	fl.ounce.
Sugar,	16	ounces av.

Dissolve the Bromide of Quinine in the Water by the aid of heat, add the Flavoring, and dissolve the Sugar in the solution.

A fl.drachm contains 1 grain Bromide of Quinine. Dose, a teaspoonful.

3248. Syrup Bromide of Quinine and Morphine.

Bromide of Morphine, 16 grains.
 Syrup Bromide of Quinine (3247), . . 16 fl.ounces.

Dissolve the Bromide of Morphine in $\frac{1}{4}$ ounce of Hot Water and add to the syrup.

A fl.drachm contains 1 grain Bromide of Quinine, $\frac{1}{8}$ grain Bromide of Morphine. Dose, a teaspoonful.

3249. Syrup Bromide of Quinine, Morphine, and Strychnine.

Bromide of Morphine, 16 grains.
 Solution of Strychnine (1942), 2 fl.drachms.
 Syrup Bromide of Quinine (3247), . . . 1 pint.

Dissolve the Morphine Salt in $\frac{1}{4}$ ounce of Hot Water, and add the solution with the Solution of Strychnine to the syrup.

A fl.drachm contains 1 grain Bromide of Quinine, $\frac{1}{8}$ grain Bromide of Morphine, and $\frac{1}{64}$ grain Strychnine. Dose, a teaspoonful.

3250. Syrup Bromide of Strychnine.

Bromide of Strychnine, 4 grains.
 Flavored Syrup, 1 pint.

Dissolve the Strychnine in $\frac{1}{2}$ fl.ounce of Boiling Water and add to the syrup.

A fl.drachm contains $\frac{1}{32}$ grain of the Strychnine Salt. Dose, a teaspoonful.

3251. Syrup Bromide of Strychnine and Morphine.

Bromide of Strychnine, 4 grains.
 Bromide of Morphine, 16 grains.
 Flavored Syrup, 1 pint.

Dissolve the Bromides in $\frac{1}{2}$ fl.ounce of Boiling Water and add to the syrup.

A fl.drachm contains $\frac{1}{32}$ grain Strychnine and $\frac{1}{8}$ grain Morphine Bromides. Dose, a teaspoonful.

3252. Syrup Bromide Strychnine, Iron and Quinine.

Bromide of Strychnine,	2 grains.
Bromide of Quinine,	128 grains.
Bromide of Iron,	256 grains.
Citrate of Potassium,	1 ounce.
Soluble Flavoring,	1 fl.ounce.
Water,	7 fl.ounces.
Sugar,	16 ounces av.

Dissolve the Citrate of Potassium in the Water, add the Iron Salt, then the Bromides, and dissolve by gentle heat, then add the Flavoring and Sugar.

A fl.drachm represents 2 grains Bromide of Iron, 1 grain Bromide of Quinine and $\frac{1}{64}$ grain Bromide of Strychnine. Dose, a teaspoonful.

3253. Syrup Bromide of Sodium.

Bromide of Sodium,	640 grains.
Soluble Flavoring,	1 fl.ounce.
Water,	8 fl.ounces.
Sugar,	16 ounces av.

Dissolve the Salt in the Water, add the flavoring and dissolve the Sugar in the solution.

A fl.drachm contains 5 grains of the Sodium Salt. Dose, a teaspoonful to a tablespoonful.

Syrups of other Bromides, as *Syrup Bromide of Potassium*, *Syrup Bromide of Ammonium*, etc., may be made in the same proportion and manner.

3254. Syrup Citrate of Iron.

Citrate of Iron and Ammonium,	256 grains.
Hot Water,	1 fl.ounce.
Flavored Syrup,	15 fl.ounces.

Dissolve the Iron Salt in the Water, and add to the Syrup.

A fl.drachm contains 2 grains of the Iron salt. The dose is a teaspoonful or two.

3255. Syrup Citrate of Iron and Quinine.

Citrate of Iron and Quinine, 256 grains.
 Hot Water, 1 fl.ounce.
 Flavored Syrup, sufficient to make . . . 1 pint.

Dissolve the Salt in the Water, and add to the Syrup.

A fl.drachm contains 2 grains Citrate of Iron and Quinine.

The dose is a teaspoonful.

3256. Syrup Citrate of Iron, Quinine and Strychnine.

Solution of Strychnine (1942), 1 fl.drachm.
 Syrup Citrate of Iron and Quinine (3255), 1 pint.

Mix them thoroughly. A fl.drachm contains 2 grains Iron and Quinine and $\frac{1}{128}$ grain Strychnine. The dose is a teaspoonful.

3257. Syrup Citrate of Iron and Strychnine.

Citrate of Iron and Strychnine, 256 grains.
 Hot Water, 1 fl.ounce.
 Flavored Syrup, 1 pint.

Dissolve the Salt in the Hot Water and add the Syrup.

A fl.drachm contains 2 grains of the Iron and Strychnine Citrate. Dose, a teaspoonful.

3258. Syrup Hypophosphite of Calcium (Lime).

Hypophosphite of Calcium, 384 grains.
 Water, 8 fl.ounces.
 Soluble Flavoring, 1 fl.ounce.
 Sugar, 16 fl.ounces.

Rub the Salt to a powder and triturate in a mortar with the Water until dissolved, add the Soluble Flavoring, filter, and dissolve the Sugar in the filtrate without heat.

A fl.drachm contains 3 grains Hypophosphite of Calcium. The dose is a teaspoonful to a dessertspoonful.

3259. Syrup Hypophosphite of Calcium and Sodium.

Syrup Hypophosphites of Lime and Soda.

Hypophosphite of Calcium,	384 grains.
Hypophosphite of Sodium,	256 grains.
Water,	8 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	16 ounces av.

Rub the salts to a fine powder and dissolve by rubbing with the Water, add the Flavoring and filter, then dissolve the Sugar in the filtrate without heat.

A fl.drachm contains 5 grains of the Hypophosphites. The dose is a teaspoonful to a dessertspoonful.

3260. Syrup Hypophosphite of Calcium, Sodium, and Potassium.

Syrup Hypophosphites Lime, Soda, and Potassa — Compound Syrup of Hypophosphites.

Hypophosphite of Calcium,	256 grains.
Hypophosphite of Sodium,	128 grains.
Hypophosphite of Potassium,	64 grains.
Water,	8 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	16 ounces av.

Rub the salts to a fine powder and then with the Water until dissolved; add the Flavoring, filter, and dissolve the Sugar in the filtrate without heat.

3261. Syrup Hypophosphites of Calcium, Sodium, Potassium, and Iron.

Syrup Hypophosphite Lime, Soda, Potassa, and Iron.

Solution Hypophosphite of Iron (1928),	1 fl.ounce.
Syrup Hypophosphites Compound (3260),	15 fl.ounces.

Mix them. A fl.drachm contains about $4\frac{1}{2}$ grains of Hypophosphites. The dose is a teaspoonful to a dessertspoonful.

3262. Syrup Hypophosphite of Iron.

Solution Hypophosphite of Iron (1928), 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Hypophosphite of Iron. Dose, a teaspoonful or more.

3263. Syrup Hypophosphite of Iron and Calcium.

Solution Hypophosphite of Iron (1928), 1 fl.ounce.

Syrup Hypophosphite of Calcium (3258), 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain of Iron and about 3 grains of Calcium Hypophosphite. Dose, a teaspoonful or more.

3264. Syrup Hypophosphite of Iron and Manganese.

Solution Hypophosphite of Iron (1928), 1 fl.ounce.

Solution Hypophosphite of Manganese

(1929), 1 fl.ounce.

Flavored Syrup, 14 fl.ounces.

Mix them. A fl.drachm contains 1 grain each of the Hypophosphites. The dose is a teaspoonful or more.

3265. Syrup Hypophosphite of Manganese.

Solution Hypophosphite of Manganese

(1929), 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain of Hypophosphite of Manganese. The dose is a teaspoonful or a dessertspoonful.

3266. Syrup Hypophosphite of Sodium.

Syrup Hypophosphite of Soda.

Hypophosphite of Sodium, 256 grains.

Hot Water, 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Dissolve the Salt in the hot Water, strain, and mix the solution with the Syrup.

A fl.drachm contains 2 grains Hypophosphite of Sodium. The dose is a dessertspoonful or more.

3267. Syrup Hypophosphites Compound with Quinine and Strychnine.

This combination has of late become very popular as a nutritive tonic, and has, to a large extent, taken the place of other compound Syrups of Hypophosphites.

Hypophosphite of Calcium, . . .	4	ounces av.
Hypophosphite of Sodium, . . .	2	ounces av.
Hypophosphite of Potassium, . . .	$\frac{1}{4}$	ounce av.
Hypophosphite of Manganese, . . .	$\frac{1}{4}$	ounce av.
Phosphate of Iron, in scales (1880), . .	1	ounce av.
Sulphate of Strychnine,	8	grains.
Sulphate of Quinine,	$\frac{1}{2}$	ounce av.
Citric Acid,	40	grains.
Salicylic Acid,	10	grains.
Sugar,	7	pounds av.
Water, sufficient to make	1	gallon.

Dissolve the Citric Acid in 8 fl.ounces of Water, and rub the Strychnine in a mortar with the solution until dissolved, then add the Quinine and Salicylic Acid to the solution, and, having transferred to a bottle, add 3 pints more of Water. Rub the Hypophosphites to a fine powder and add to the solution in the bottle. Dissolve the Phosphate of Iron in 8 fl.ounces of hot water, and add to the solution in the bottle. When all the salts are dissolved, filter the solution and dissolve the Sugar in the filtrate, making up the measure to 1 gallon with Water. If desired this may be flavored with 4 fl.ounces of Soluble Flavoring, but as found in the market it is usually without flavor.

This is similar in composition to the proprietary *Fellows' Syrup of Hypophosphites Compound*. The dose is a teaspoonful to a dessertspoonful. A fl.drachm contains about 4 grains of the mixed Hypophosphites.

3268. Syrup Hypophosphites Compound, with Lactopeptine.

Syrup Hypophosphites Compound (3260),	12 fl.ounces.
Lactopeptine,	256 grains.
Hypophosphorous Acid,	1 fl.ounce.
Water,	3 fl.ounces.

Rub the Lactopeptine with the Water, add the Acid and heat gently by water-bath until dissolved, strain the solution and add to the Syrup, mixing them thoroughly.

3269. Syrup Hypophosphites Compound, Iron, Quinine, and Strychnine.

Quinine (Alkaloid),	60 grains.
Strychnine (Alkaloid),	1 grain.
Solution Hypophosphite of Iron (1928),	1 fl.ounce.
Hypophosphorous Acid,	2 fl.drachms.
Flavored Syrup,	15 fl.ounces.

Dissolve the Quinine and Strychnine in the Hypophosphorous Acid by very gentle heat and add to the Syrup, then add the Iron Solution.

A fl.drachm contains $\frac{1}{2}$ grain of Quinine, 1 grain Iron, and $\frac{1}{128}$ grain Strychnine. The dose is a teaspoonful to a dessert-spoonful.

3270. Syrup Iodide of Calcium.

Syrup Iodide of Lime.

Iodide of Calcium (Lime),	256 grains.
Warm Water,	1 fl.ounce.
Flavored Syrup,	15 fl.ounces.

Dissolve the Calcium Iodide by rubbing with the Water and add the solution to the flavored Syrup.

A fl.drachm contains 2 grains Iodide of Calcium. This Syrup is given as an alterative in doses of a teaspoonful or more.

3271. Syrup Iodide of Iron (Tasteless).

Tasteless Iodide of Iron, 256 grains.
 Warm Water, 1 fl.ounce.
 Flavored Syrup, 15 fl.ounces.

Rub the Iodide with the Water and add the solution to the Syrup.

A fl.drachm contains 2 grains of the Tasteless Iodide of Iron. This is given as a tonic and resolvent in doses of a teaspoonful or more. It has not the disagreeable taste of the official Syrup Iodide of Iron.

3272. Syrup Iodide of Iron and Manganese.

Iodide of Iron (tasteless), 128 grains.
 Iodide of Manganese, 128 grains.
 Warm Water, 1 fl.ounce.
 Flavored Syrup, 15 fl.ounces.

Rub the Iodides with the Water and add the solution to the Syrup.

A fl.drachm contains 1 grain each Iodide of Iron and Manganese. The dose is a teaspoonful as a tonic and alterative.

3273. Syrup Iodide of Manganese.

Iodide of Manganese, 256 grains.
 Warm Water, 1 fl.ounce.
 Flavored Syrup, 15 fl.ounces.

Dissolve the Iodide by rubbing with the Water, and add the solution to the Syrup.

A fl.drachm contains 2 grains Iodide of Manganese. The dose is a teaspoonful, as a tonic.

3274. Syrup Iodide of Starch.

Iodide of Starch, 16 grains.
 Flavored Syrup, 1 fl.ounce.

Rub them well together.

In this the Iodide of Starch is *suspended* in the Syrup, and it should be shaken when taken or dispensed. A colorless syrup

may be made by adding 128 grains Hyposulphite of Sodium, but this produces a Syrup of Iodide of Sodium instead.

The Syrup Iodide of Starch may be given in doses of 1 to 4 fl.drachms.

3275. Syrup of Iron and Sodium Albuminate.

"Nitrogenized Iron."

Chloride of Iron (the salt),	128 grains.
Glycerin,	8 fl.ounces.
Albumen (white of egg),	6 fl.ounces.
Solution of Soda (1915), q. s., about	2 fl.ounces.

Mix part of the Glycerin with the White of Egg and dissolve the Iron by gentle heat in the remainder; add the solution of Iron thus prepared to the mixture of Glycerin and Albumen, stirring them well together for an hour or two, and forming a semi-solid gelatinous mass; then add the Solution of Soda gradually, and with constant stirring, until the mass is dissolved and the solution is neutral. Allow to stand a few hours for the froth to subside, then pour off and strain.

In making this preparation it is necessary to have it neutral, which may be determined by testing with litmus paper. If not entirely liquid after standing a few hours it will be necessary to add a little more Solution of Soda. This preparation has a bland, sweet taste and a bright color. It is an excellent iron tonic and nutritive, given in doses of a teaspoonful to a tablespoonful, a fl.drachm containing 1 grain of the Iron salt.

3276. Syrup Dialysed Iron.

Solution Dialysed Iron (504),	640 minims.
Flavored Syrup, enough to make	1 pint.

Mix them. A fl.drachm contains 5 minims Solution Dialysed Iron. The dose is a teaspoonful to a dessertspoonful.

3277. Syrup Lactate of Iron.

Solution Protoxide of Iron (1940),	1 fl.ounce.
Lactic Acid,	90 minims.
Flavored Syrup,	15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Lactate of Iron.

**3278. Syrup Lactophosphate of Calcium
(Lime).**

Solution Lactophosphate of Calcium (1931), 2 fl.ounces.

Flavored Syrup, 14 fl.ounces.

Mix them. (See also 3129). A fl.drachm contains 2 grains Lactophosphate of Calcium. The dose is a teaspoonful to a dessertspoonful.

3279. Syrup Lactophosphate of Iron.

Solution Lactophosphate of Iron (1932), 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Lactophosphate of Iron. The dose is a teaspoonful as a tonic.

**3280. Syrup Lactophosphate of Iron and
Calcium (Lime).**

Solution Lactophosphate of Iron (1932), . ½ fl.ounce.

Solution Lactophosphate of Calcium (1931), 1 fl.ounce.

Flavored Syrup, 14½ fl.ounces.

Mix them. A fl.drachm contains ½ grain Iron and 1 grain Calcium Lactophosphates. The dose is a teaspoonful or more.

**3281. Syrup Lactophosphate of Calcium
and Pepsin.**

Syrup Lactophosphate of Calcium (3278), 8 fl.ounces.

Syrup Pepsin (3288), 8 fl.ounces.

Mix them. A fl.drachm contains about 1 grain Lactophosphate of Calcium and 2 grains Pepsin. The dose is a teaspoonful to a dessertspoonful.

3282. Syrup Lactophosphate of Manganese.

Solution Lactophosphate of Manganese (1933), 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Lactophosphate of Manganese. The dose is a teaspoonful to a dessertspoonful as a tonic.

3283. Syrup Lactophosphates Compound.*Syrup Lactophosphate Calcium, Iron and Manganese.*

Solution Lactophosphate of Iron (1932),	1/2 fl.ounce.
Solution Lactophosphate of Calcium (1935),	1 fl.ounce.
Solution Lactophosphate of Manganese (1933),	1/2 fl.ounce.
Flavored Syrup,	14 fl.ounces.

Mix them. A fl.drachm contains 1/2 grain each Lactophosphate of Iron and Manganese, and 1 grain Lactophosphate of Calcium. Dose, a teaspoonful to a dessertspoonful as a tonic.

3284. Syrup Lactopeptine.

Lactopeptine,	384 grains.
Hydrochloric Acid,	1 1/2 fl.drachm.
Water,	8 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	14 fl.ounces.

Macerate the Lactopeptine in the mixed liquids for 24 hours, with occasional agitation, then strain, and dissolve the Sugar in the liquid.

A fl.drachm contains 3 grains Lactopeptine. The dose is a teaspoonful or more.

3285. Syrup Lactopeptine Compound.

Solution Phosphate of Iron (1935),	1 fl.ounce.
Solution Phosphate of Calcium (1936),	1 fl.ounce.
Phosphate of Sodium,	128 grains.
Phosphate of Potassium,	128 grains.
Hydrochloric Acid,	1 1/2 fl.drachm.
Lactopeptine,	256 grains.
Water,	6 1/2 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	14 fl.ounces.

Rub the Lactopeptine and the salts together; mix the solutions, add the Acid and Water, and add the powders to the

mixture. Macerate for 24 hours, and strain, add the flavoring and dissolve the Sugar in the liquid. The dose is a teaspoonful to a dessertspoonful.

3286. Syrup Morphine.

This may be made with either the *Acetate*, *Hydrochlorate*, *Sulphate*, or other soluble salt of Morphine, as follows :

The Morphine Salt,	16 grains.
Hot Water,	2 fl.drachms.
Flavored Syrup,	1 pint.

Dissolve the Morphine Salt in the Hot Water and add to the Syrup. A fl.drachm contains $\frac{1}{8}$ grain of the salt. The usual dose is a teaspoonful, as an anodyne.

3287. Syrup Muriate of Ammonia.

Syrup Chloride of Ammonium.

Chloride of Ammonium in powder, . .	640 grains.
Water,	8 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	16 ounces av.

Dissolve the salt in the Water, filter, add the Flavoring and dissolve the Sugar in the liquid.

A fl.drachm contains 5 grains of the salt. The dose is a teaspoonful or more.

3288. Syrup Pepsin.

Saccharated Pepsin,	1 ounce av.
Hydrochloric Acid,	1 fl.drachm.
Water,	8 fl.ounces.
Soluble Flavoring,	1 fl.ounce.
Sugar,	16 ounces av.

Rub the Pepsin with the Water and add the Acid, let stand until dissolved, strain, add the Flavoring, and dissolve the Sugar in the liquid without heat.

A fl.drachm contains $3\frac{1}{2}$ grains Saccharated Pepsin. The dose is a teaspoonful to a dessertspoonful.

3289. Syrup Nascent Phenic Acid.

Pure Phenic or Carbolic Acid,	67 grains.
Glycerin,	1 fl.ounce.
Flavored Syrup,	15 fl.ounces.

Rub the Acid with the Glycerin in a mortar until dissolved, and add to the Syrup.

This is somewhat heavier and of a different flavor than the *Syrup Pure Nascent Phenic Acid* prepared by Déclat Manufacturing Co., New-York, but contains the same quantity of the acid. If desired like this, use double the quantity of Glycerin with 1 ounce of Water and plain Syrup, flavoring with Essence of Cognac, 1 fl.drachm.

The dose is a tablespoonful.

3290. Syrup Phosphate of Calcium.

Syrup Phosphate of Lime.

Solution Phosphate of Calcium (1935), .	2 fl.ounces.
Flavored Syrup,	14 fl.ounces.

Mix them. A fl.drachm contains 2 grains Phosphate of Lime. The dose is a teaspoonful to a dessertspoonful.

3291. Syrup Phosphate of Iron.

Solution Phosphate of Iron (1936), .	1½ fl.ounces.
Flavored Syrup,	14½ fl.ounces.

Mix them. This may also be prepared by dissolving 384 grains of Phosphate of Iron (the scale salt) in a fl.ounce of boiling Water and adding to 14½ fl.ounces of Flavored Syrup.

A fl.drachm contains 3 grains of Phosphate of Iron. The dose is a teaspoonful or more. See also 3137.

3292. Syrup Phosphate of Manganese.

Solution Phosphate of Manganese (1937),	1 fl.ounce.
Flavored Syrup,	15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Phosphate of Manganese. The dose is 1 or 2 teaspoonfuls, as a tonic.

3293. Syrup Phosphate of Manganese Compound.

Solution Phosphate of Iron (1936),	1/2 fl.ounce.
Solution Phosphate of Manganese (1937),	1 fl.ounce.
Phosphate of Sodium,	128 grains.
Flavored Syrup,	14 fl.ounces.

Dissolve the Sodium Salt in half an ounce of hot Water and add to the Syrup, then add the solutions and mix.

A fl.drachm contains 1 grain each Iron, Manganese, and Sodium Phosphates. Dose, a teaspoonful or two, as a tonic.

3294. Syrup Phosphates Compound.

Chemical Food.

Solution Phosphates Compound (1938),	2 fl.ounces.
Flavored Syrup,	14 fl.ounces.

Mix and color with Red Coloring (442). The dose is a teaspoonful or two, as a tonic and vitalizer.

A fl.drachm contains about $3\frac{1}{2}$ grains of the mixed Phosphates in solution, with excess of Phosphoric Acid.

This Syrup has been a very popular preparation. The formula above given is the most convenient, as the solution has only to be mixed with the Syrup, the tedious process which was formerly used being avoided. As some may wish to prepare this after the old method the formula is here given. The following solutions are first made :

Sulphate of Iron,	1 1/4 ounces.
Phosphate of Sodium,	1 3/4 ounces.

Dissolve the Iron salt in half gallon hot Water, and mix with 1 gallon Water in an earthen crock or other suitable vessel for precipitating. Dissolve the Sodium salt in half gallon hot Water, and add the Solution of Iron to it in the jar. Agitate thoroughly and allow to stand a few hours for the precipitate to subside. Pour off the Water, and pour upon the precipitate 1 gallon of fresh Water. Agitate, allow to stand as before, pour off the Water, and pour the precipitate upon a cloth strainer to drain. (The object of using the large amount of Water in the precipitating jar is to dissolve the Sulphate of Sodium as soon as formed, and save the troublesome washing of

the precipitate usually adopted.) As soon as the precipitate is drained, mix it with

Water,	2 fl.ounces.
Sugar,	1 ounce av.
Hydrochloric Acid,	6 fl.drachms.

and dissolve. This makes a Solution of Phosphate of Iron with Hydrochloric Acid. Then take of

Phosphate of Calcium (Lime),	1280 grains.
Hydrochloric Acid, q. s., or	4 ounces.
Hot Water,	4 ounces.

Mix the Phosphate of Lime with the hot Water, and add enough Hydrochloric Acid to dissolve. (The amount depends upon the strength of the Acid.) This makes a Solution of Phosphate of Lime with Hydrochloric Acid:

Then, to make the Syrup, take the

Solution Phosphate of Iron,	as above.
The Solution Phosphate of Calcium (Lime),	as above.
Diluted Phosphoric Acid,	5 ounces.
Extract Vanilla,	1 ounce.
Cochineal, powdered,	$\frac{1}{2}$ ounce.
Phosphate of Sodium,	160 grains.
Phosphate of Potassium,	80 grains.
Water, enough to make	3 pints.
Sugar,	4 $\frac{1}{2}$ pounds av.

Mix the Solutions of Iron and Calcium, and add the Phosphoric Acid. Dissolve the Phosphate of Sodium and Potassium in a little hot Water, and add to the Solutions. Add the Vanilla and Cochineal, and then Water enough to make the measure 3 pints. Allow to stand a few hours, to get the color from the Cochineal, etc., and filter. Dissolve the Sugar in the filtrate, and strain if necessary.

This makes a beautiful permanent Syrup.

Each fl.drachm contains 2 grains Phosphate of Calcium, 1 grain Phosphate Iron, with fractions of a grain of Phosphate of Sodium and Potassium, and an excess of Acid. The Hydrochloric Acid in it is not objectionable and makes the preparation permanent.

3295. Syrup Phosphate of Quinine.

Sulphate of Quinine,	128 grains.
Phosphoric Acid, diluted,	$\frac{1}{2}$ fl.ounce.
Flavored Syrup,	1 pint.

Dissolve the Quinine Salt in the Acid and add the Syrup. A fl.drachm contains 1 grain of the Quinine Salt.

3296. Syrup Phosphate of Quinine and Iron.

Sulphate of Quinine,	128 grains.
Phosphoric Acid, diluted,	$\frac{1}{2}$ fl.ounce.
Solution Phosphate of Iron (1936),	$\frac{1}{2}$ fl.ounce.
Flavored Syrup,	15 fl.ounces.

Dissolve the Quinine Salt in the Acid and add to the Syrup, mix, then add the Iron Solution.

A fl.drachm contains 1 grain each Iron and Quinine.

3297. Syrup Phosphate of Quinine, Iron and Strychnine.

Syrup Phosphate of Quinine and Iron (3296), 1 pint.

Solution of Strychnine (1942), 2 fl.drachms.

Add the Strychnine Solution to the Syrup and mix them thoroughly.

A fl.drachm contains 1 grain each Quinine and Iron and $\frac{1}{64}$ grain Strychnine. See also the official Syrup (3138).

This Syrup is known and often prescribed as *Syrup Triple Phosphates*.

3298. Syrup Protoxide of Iron.

Solution Protoxide of Iron, 1 fl.ounce.

Flavored Syrup, 15 fl.ounces.

Mix them. A fl.drachm contains 1 grain Protocitrate of Iron. The dose is a dessertspoonful or more.

3299. Syrup Pyrophosphate of Iron.

The Syrups of Pyrophosphate of Iron and combinations for which formula have been given in previous issues of FENNER'S FORMULARY are not here repeated, for the reason that much more stable preparations may be made with the new Phosphate of Iron salt in scales of the U. S., 1880, Pharmacopœia. If desired, they may be made by adding Solution of Pyrophosphate of Iron, double the quantity as is directed of the Phosphate to neutral Syrups.

Syrup Pyrophosphate of Iron may be made by adding 2 fl.ounces of the Solution to 14 fl.ounces of the Syrup.

Soda Water Syrups.

A great variety of Syrups are used by those who dispense Soda Water, for flavoring and sweetening the gaseous water. Simple Syrup is used as a base and the flavoring ingredients added. The flavoring consists of natural fruit juices, or various solutions of oils or aromatic substances, ethers, etc., which are mixed with the Syrup.

As these solutions are variously made and are of different strength as prepared by different manufacturers, definite formulas cannot be given for any except those flavorings which are mentioned in this volume. It will, therefore, be understood that in the formulas given it is expected that the flavorings designated will be such as are made after the formulas which are referred to—which may be either prepared as directed or purchased of the Fenner Medicine Co.

3300.

Syrup for Soda Water.

As a basis for the Syrups used for Soda Water a simple Syrup of good body and quality, to which the flavoring ingredients are to be added, may be made by druggists as follows:

Gelatin, Cooper's or Cox's,	$\frac{3}{4}$ ounce av.
Water,	1 gallon.
Sugar, best white,	10 pounds av.

Soak the Gelatin in a pint of Water for half an hour, then dissolve it by the heat of a water-bath, and, while hot, strain into the remainder of the Water through a coarse muslin strainer, stir thoroughly, add the Sugar, stir until dissolved, strain and set away in a cool place.

The Syrup should be made of Crushed, Granulated, or "A" Coffee Sugar, and the best water that can be conveniently obtained. It should be made in well-tinned or zinc cans, or stone crocks; a wooden vessel of any kind imparts its peculiar flavor to Syrup after standing, and rapidly develops the "acetic" change. The Syrup is best made by putting the proper amount of water in a can or crock, adding the sugar a portion at a time, and stirring with a stick until dissolved. A cover should be fitted to the can or crock, and a stopcock can be placed at the bottom, or a dipper may be hung on the inside always ready for use.

Syrup should not be made up in any large quantity (no more than enough to last a week or ten days), and should always be made by the cold process.

Many druggists buy for this purpose the *Double Refined Rock Candy Syrup* made by Dryden & Palmer, of Baltimore, Md., or other similar Syrup.

As this has no ingredients in it to make it "hold its foam" when the water is drawn into it, "Soda Foam" must be added either to the simple Syrup or when made up and flavored, the most convenient way being to add it to the simple Syrup which is then all ready for use. This may be done by dissolving $3\frac{1}{2}$ ounces av. of Gelatin in 2 quarts of Water and adding to 10 gallons of the Syrup, while hot, or by adding the proper quantity of the prepared Soda Foam. (3301.)

3301.**Soda Foam.**

If the Syrup used for Soda Water is prepared as directed (3300) no other Foam will be necessary, but if the boughten Syrup is used it is necessary to add something to make it retain its Foam. Gelatin may be used as directed, but it is sometimes convenient to have a liquid Foam which may be added to the Syrups as made up by the gallon. For this purpose the following formulas may be used:

Soap Bark (Quillaya, ground).	1 pound av.
Alcohol,	8 fl.ounces.
Water, a sufficient quantity.	

Cover the Soap Bark, in a porcelain-lined vessel, with boiling Water and infuse for 1 hour, then pour off the liquid and reserve. Pour fresh boiling Water on the Bark and again infuse, and pour off as before, repeating the operation three times; mix the decoctions obtained, and evaporate to $1\frac{1}{2}$ pint; to this, when cool, add the Alcohol, and, after standing, filter. Add 1 ounce of this to a gallon of Syrup to make it foam. Acid Syrups require a larger quantity.

A still better Foam, because it is nearly tasteless, may be prepared from *Soaproot*, a species of California lily-bulb, using the same proportions and making in the same manner as the foregoing.

3302.**Fruit Acid.**

Citric Acid,	4 ounces av.
Hot Water,	8 fl.ounces.

Dissolve the Acid in the Water. This is used for giving an acid or sour taste to Syrups, thereby making many of them more palatable. A more concentrated solution like 1927 is more desirable, but the formula here given is of the same strength as is generally prepared and used. The quantity to be used is usually stated in the formula, but may be regulated to suit the taste.

3303.**Fruit Juice Syrups.**

For making Fruit Syrups from juices as prepared (3028) it is only necessary to mix the juices 1 part by measure with 5 parts by measure of Syrup (3300). If they are desired of stronger flavor mix one part of Juice with 4 parts of Syrup.

Fruit Syrups may also be made from the freshly expressed juices by dissolving in them all the Sugar they take when made by the cold process, which is about 14 pounds to each gallon of juice.

Syrups made from Fruit Juices are infinitely superior to any which can be made from artificial extracts.

The following Fruit Syrups may be made from Fenner's Fruit Juices in the manner above described, by mixing 1 measure of the Fruit Juice with 5 measures of Syrup :

Syrup Apricot,	Syrup Mulberry,
Syrup Banana,	Syrup Orange,
Syrup Blackberry,	Syrup Peach,
Syrup Cherry, Black,	Syrup Pear,
Syrup Cherry, Red,	Syrup Pineapple,
Syrup Currant, Red,	Syrup Plum or Prune,
Syrup Grape,	Syrup Quince,
Syrup Huckleberry,	Syrup Raspberry, Black,
Syrup Lemon,	Syrup Raspberry, Red,
Syrup Lime,	Syrup Strawberry.

3304. Ambrosia Syrup.

Raspberry Juice,	1 pint.
Pineapple Juice,	1 pint.
Vanilla Extract,	1 fl.ounce.
Syrup, sufficient to make	1 gallon.

This is a rich, finely-flavored Fruit Syrup. Other Fruit Juices besides those mentioned may be used.

3305. Apple Syrup.

Apple Essence (958),	$\frac{1}{2}$ fl.ounce.
Cider, sweet,	1 pint.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup, sufficient to make	1 gallon.

If sweet or bottled Cider is not readily at hand use 1 fl.ounce of the Essence of Apple, and omit it.

3306. Apricot Syrup.

Apricot Juice,	1 pint.
Syrup,	2 pints.

An inferior Syrup may be made with

Apricot Essence (958),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

3307. Banana Syrup.

Banana Juice,	1 pint.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	5 pints.

Mix them.

An inferior Syrup may be made with

Banana Essence (959),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

3308. Birch Beer Syrup.

Birch Beer Extract (952),	3 fl.ounces.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

Mix and color with Caramel.

3309. Ottawa Beer Syrup, from Ottawa Beer Extract (953).

3310. Peruvian Beer Syrup, from Peruvian Beer Extract (954).

3311. Root Beer Syrup, from Root Beer Extract (955).

3312. Spruce Beer Syrup, from Spruce Beer Extract (956).

And others similar may be made in the same proportion and manner as Birch Beer Syrup. Unless the business in Soda Water is quite large, it is much the best way to have these in the form of Syrup as above, and draw the plain Soda Water upon them the same as any other syrups.

3313. Blackberry Syrup.

Blackberry Juice,	1 pint.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	5 pints.

Mix them.

An inferior Syrup may be made with

Blackberry Essence (960),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

This may be colored with Caramel and Red Coloring.

3314. Brandy Syrup.

Cognac Essence,	$\frac{1}{4}$ fl.ounce.
Brandy,	2 pints.
Fruit Acid,	2 fl.drachms.
Syrup,	6 pints.

Mix them.

Other Liquor Syrups may be prepared with other liquors in a similar manner, using the desired spirits and the essences of the kind required. Bourbon and Rye Whisky, Rum, and other liquors are made into syrups in this way. They are usually sold under some fancy name.

3315. Calamus Syrup.

Calamus Essence (894),	2 fl.ounces.
Syrup,	1 gallon.

Mix them.

3316. Calisaya Syrup.

Sulphate of Quinine,	10 grains.
Sulphate of Cinchonidine,	30 grains.
Fruit Acid,	2 fl.drachms.
Syrup,	1 gallon.

Dissolve the salts in the Acid and 1 ounce of Water, and mix with the Syrup. Color red with Red Coloring.

3317. Calisaya Phosphate Syrup.

Fenner's Calisaya Phosphate,	1 pint.
Syrup,	7 pints.

Mix them.

This is an excellent tonic, the valuable properties of Calisaya Bark being combined with Phosphates Compound.

3318. Caraway Syrup.

Caraway Essence (895),	2 fl.ounces.
Syrup,	1 gallon.

Mix them.

3319. Catawba Syrup.

Catawba Grape Juice,	1 pint.
Brandy,	$\frac{1}{2}$ pint.
Syrup,	5 pints.

Mix them.

An inferior Syrup may be made with

Catawba Grape Essence (965),	1 fl.ounce.
Fruit Acid,	1 fl.ounce.
Syrup,	1 gallon.

Other varieties of Grape Syrup may be made in the same manner by using other grape juices.

3320. Champagne Syrup.

Rhine Wine,	3 pints.
Pear Essence (972),	$\frac{1}{2}$ fl.ounce.
Syrup,	5 pints.

Mix them.

3321. Cherry Syrup, Red or Black.

Cherry Juice, Red or Black,	1 pint.
Syrup,	5 pints.

Mix them. Made from true Cherry Juice, these Syrups are excellent.

Inferior Syrups may be made from the artificial extracts, as follows :

Black or Red Cherry Essence (961 or 978),	1 fl.ounce.
Fruit Acid,	1 fl.ounce.
Syrup,	1 gallon.

Mix them.

3322. Cherry Phosphate Syrup.

Concentrated Solution Phosphates (1938),	1 fl.ounce.
Cherry Juice,	1 pint.
Syrup,	5 pints.

Mix them. This may be flavored stronger by adding $\frac{1}{4}$ fl.ounce Cherry Essence (961.) It is a popular drink at the fountain.

3323. Wild Cherry Syrup.

Fluid Extract Wild Cherry,	8 fl.ounces.
Syrup,	1 gallon.

Or,

Wild Cherry Essence (981),	2 fl.ounces.
Syrup,	1 gallon.

Mix them.

3324. Chocolate Syrup.

Fenner's Perfection Cream Chocolate,	1 pint.
Syrup,	3 pints.

Mix them.

The Perfection Chocolate Cream mentioned is a liquid emulsion of Chocolate, made by grinding the finest Chocolate with Gum Syrups and Flavoring Extracts through a mill specially constructed for the purpose. It mixes with

Syrup without separation, and can be drawn like any other Syrup from the fountain. To make it successfully requires expensive machinery. Ordinary Chocolate Syrup is made as follows :

Chocolate, 1 cake or	8 ounces av.
Vanilla Extract (940),	1 fl.ounce.
Syrup,	3½ pints.

Liquefy the Chocolate by a water-bath and gradually add the Syrup, stirring them well together until all is added, strain through a wire sieve, and, when nearly cold, add the Vanilla, mixing them well together. As thus made the Syrup separates from the Chocolate after standing, and the mixture must be shaken before using.

3325. Cinnamon Syrup.

Cinnamon Essence (897),	1 fl.ounce.
Syrup,	1 gallon.

Mix them.

3326. Claret Syrup.

Claret,	2 pints.
Syrup,	4 pints.

Mix them.

3327. Coffee Syrup.

Coffee Extract (932),	8 fl.ounces.
Syrup,	1 gallon.

Mix them. This Syrup depends upon the strength of the Coffee Extract used. It may be flavored to suit with any other good Extract of Coffee, or as follows :

Java and Mocha Coffee, browned, each,	4 ounces.
Boiling Water,	4 pints.

Make a decoction, strain and dissolve in the liquid 6 pounds of Sugar, and add Soda Foam 1 ounce.

3328. Cognac Syrup.

Cognac Essence (902),	1 fl.ounce.
Syrup,	1 gallon.

Mix them. This may be improved by the addition of half a pint of Brandy.

3329. Cream Syrup.

Sweet Milk, fresh,	1 quart.
Corn Starch,	½ ounce av.
Egg,	1
Sugar,	1 ½ pound av.
Vanilla Extract,	1 fl.ounce.
Salicylic Acid,	5 grains.

Mix the Corn Starch with an ounce of Water, beat up the Egg thoroughly and mix them, then heat the Milk with the mixture to make a custard. When it has thickened, take off and add the Sugar and Salicylic Acid. When cool add the Vanilla Extract.

As thus prepared this Syrup will keep for some time, but it is advisable to make it fresh every morning for use during the day. This Syrup should not be kept in the syrup cans but in a bottle on the ice.

Many do not make a Cream Syrup at all, but keep cream in a bottle handy, which is added to the other Syrups as desired.

Cream Syrup is seldom drawn alone, but is mixed with other Syrups, as Chocolate, Coffee, Vanilla, Strawberry, and, in fact, nearly all others. Some druggists have the leading Syrups prepared already with cream, but it is not advisable except for a very large business, as the cream or Cream Syrup may readily be added to any other Syrup.

3330. Curaçoa Syrup.

Curaçoa Essence (904),	1 fl.ounce.
Fruit Acid,	½ fl.ounce.
Syrup,	1 gallon.

Mix them. This is similar to but of finer flavor than Orange.

3331. Currant Syrup, Red or Black.

Currant Juice,	1 pint.
Syrup,	5 pints.

Mix them.

An inferior Syrup may be made with

Currant Essence, Black or Red (962, 979),	1 fl.ounce.
Fruit Acid,	1 fl.ounce.
Syrup,	1 gallon.

Mix them.

3332. Don't Care Syrup.

Most any Syrup may be drawn when "Don't Care" is wanted. The following is a general favorite:

Wintergreen Essence,	1 ounce.
Vanilla Extract,	2 ounces.
Syrup,	1 gallon.

Mix them.

3333. Egg Nogg Syrup, or Milk Punch Syrup.

Brandy, Jamaica Rum, each,	4 ounces.
Fresh Cream,	1 pint.
or Milk,	1 quart.
Eggs,	2
Corn Starch,	2 ounces.
Extract Vanilla (940),	1 ounce.
Syrup,	1 quart.

Beat the Eggs and the Corn Starch, and add the Milk; heat to a custard, stirring constantly; when it thickens remove from the fire, cool, and add the Brandy, Rum, and Vanilla Flavoring.

3334. Ginger Syrup.

Soluble Extract of Ginger (943),	4 fl.ounces.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

Mix them. Other Extracts of Ginger which are not "soluble" may be used, but they do not make so good preparations.

3335. Ginger Ale Syrup.

Ginger Ale Extract (944),	3 fl.ounces.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

Mix them. This is the most convenient manner of drawing Ginger Ale, and gives as good satisfaction as when drawn from a separate fountain.

3336. Grape Syrup.

Grape Juice,	1 pint.
Syrup,	5 pints.

Mix them. Any kind of Grape Juice may be made up into a Syrup; half a pint of Brandy added improves the flavor.

An inferier Syrup may be made with

Grape Essence (965),	1 fl.ounce.
Fruit Acid,	1 fl.ounce.
Syrup,	1 gallon.

3337. Grape Phosphate Syrup.

Solution Phosphates Concentrated (938),	1 $\frac{1}{2}$ fl.ounce.
Grape Juice,	1 $\frac{1}{2}$ pint.
Syrup, sufficient to make	1 gallon.

Mix them. This is a very popular Syrup.

3338. Huckleberry Syrup.

Huckleberry Juice,	1 pint.
Fruit Acid,	$\frac{1}{4}$ fl.ounce.
Syrup,	5 pints.

Mix them. Blueberry Syrup, which is much the same, is made in the same manner.

An inferior Syrup may be made with

Blueberry Essence,	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

3339. Hock Syrup.

Hock Wine,	2 pints.
Syrup,	6 pints.

Mix them.

3340. Lemon Syrup.

This is usually made with

Lemon Essence (910),	1 fl.ounce.
Fruit Acid,	$1\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

If Lemon Juice is used for making the Syrup, take

Lemon Juice,	1 pint.
Lemon Essence (910),	$\frac{3}{4}$ fl.ounce.
Syrup,	5 pints.

A clear Syrup of Lemon may be made by taking

Soluble Extract of Lemon (945),	3 fl.ounces.
Fruit Acid,	$1\frac{1}{2}$ fl.ounce.
or Lemon Juice,	1 pint.
Syrup,	1 gallon.

Lemon Syrup deteriorates rapidly, and the very best way to dispense it is to have a bottle of Lemon Essence, with a squirt top, a bottle of Lemon Juice, and plain Syrup ready at hand. The plain Syrup should be kept for this and other purposes in one of the Syrup cans. Draw the Syrup in the glass, add the Juice (some want it more acid than others), then the Essence, and draw the gaseous water upon it as usual.

These same remarks apply also to Lime and Orange Syrups.

3341. Lemon Phosphate Syrup.

Solution Phosphates Concentrated (1938),	2 fl.ounces.
Lemon Essence (910),	1 fl.ounce.
Syrup,	1 gallon.

Mix them.

3342. Lime Fruit Syrup.

Lime Juice, 1 pint.
 Syrup, 5 pints.

This Syrup is strongly acid, which is as usually wanted when Lime Syrup is ordered. It may be flavored more, if desired, by adding $\frac{1}{2}$ fl.ounce Lime Essence (911). It is most convenient to have a bottle of Lime Juice handy, and add to plain Syrup when wanted, as directed for Lemon Syrup.

3343. Lime Fruit Phosphate Syrup.

Solution Phosphates Compound (1938), 1 fl.ounce.
 Lime Fruit Juice, 1 pint.
 Lime Essence (911), 1 fl.ounce.
 Syrup, sufficient to make 1 gallon.

3344. Mace or Nutmeg Syrup.

Mace or Nutmeg Essence (911 or 914), $1\frac{1}{2}$ fl.ounce.
 Syrup, 1 gallon.

Mix them. This makes a fine addition to some of the other Syrups, but is seldom used alone.

3345. Malt Tonic Syrup.

Liquid Malt Extract, 1 pint.
 Syrup, 5 pints.
 Mix them.

3346. Malt Hop Phosphate Syrup.

Fenner's Malt Hop Phosphate, 1 pint.
 Syrup, 7 pints.

Mix them. This is an excellent tonic and restorative, and makes an attractive drink at the fountain.

3347. Maple Syrup.

Maple Syrup, with Soda Foam added, or Maple Sugar, $3\frac{1}{2}$ pounds.
 Water, 1 quart.

Dissolve by heat and add Soda Foam.

3348. Mulberry Syrup.

Mulberry Juice, 1 pint.
 Syrup, 5 pints.

Mix them.

3349. Nectar Syrup.

Vanilla Extract (939),	2 fl.ounces.
Pineapple Juice,	1 pint.
Raspberry Juice,	1 pint.
Syrup,	1 gallon.

Mix them.

This may be made, also, as follows :

Nectar Essence (968),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

3350. Nectarine Syrup.

Nectarine Essence (969),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

Mix them. This may also be made from Nectarine Fruit Juice when it can be obtained, in the same manner as other Fruit Syrups.

3351. Orange Syrup.

Orange Essence (915),	1 fl.ounce.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

If Orange Juice is used for making the Syrup, take

Orange Juice,	1 pint.
Orange Essence (915),	$\frac{3}{4}$ fl.ounce.
Syrup,	5 pints.

It may be made, also, with

Soluble Extract of Orange (948),	3 fl.ounces.
Fruit Acid,	$\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

This Syrup deteriorates by standing, and may best be dispensed as directed after Lemon Syrup.

3352. Orange Phosphate Syrup.

Concentrated Solution Phosphates (1938),	2 fl.ounces.
Orange Essence (915),	1 $\frac{1}{2}$ fl.ounce.
Syrup,	1 gallon.

Mix them. This is quite a popular beverage.

3353. Maltese Orange Syrup.*Red Orange of Malta Syrup—Blood Orange Syrup.*

Orange Essence (915),	1 ½ fl.ounce.
Fruit Acid,	½ fl.ounce.
Syrup,	1 gallon.

Mix them, and color red with Cochineal Coloring.

3354. Orange Flower Syrup.

Orange Flower Water,	1 pint.
Syrup,	4 pints.

This is sometimes added to other Syrups but is seldom dispensed alone.

3355. Orgeat Syrup.

Orgeat Essence (970),	1 fl.ounce.
Syrup,	1 gallon.

The plain Bitter Almond Syrup is frequently dispensed under this title.

Bitter Almond Essence (893),	1 fl.ounce.
Syrup,	1 gallon.

3356. Peach Syrup.

Peach Juice,	1 pint.
Syrup,	5 pints.

An inferior Syrup may be made from

Peach Essence (971),	1 fl.ounce.
Fruit Acid,	½ fl.ounce.
Syrup,	1 gallon.

Mix them.

3357. Pear Syrup.

Pear Juice,	1 pint.
Syrup,	5 pints.

A very good artificial Pear Syrup may be made with

Pear Essence (972),	1 fl.ounce.
Fruit Acid,	½ fl.ounce.
Syrup,	1 gallon.

Mix them.

3358. Pear Phosphate Syrup.

Concentrated Solution Phosphates (1938),	2 fl.ounces.
Pear Essence (972),	1 fl.ounce.
Syrup,	1 gallon.

Mix them. This may also be made with Pear Juice 1 pint, Concentrated Solution Phosphates 1 ounce, Syrup 5 pints.

3359. Phosphate Syrups.

A great variety of Phosphate Syrups may be made by combining Concentrated Solution of Phosphates Compound (1938) with various Fruit Syrups, etc. The principal ones have been mentioned under the heading of the Syrup with which the combinations are made. The Phosphate Syrups are much in demand and take well wherever introduced.

3360. Acid Phosphate Syrup.

Concentrated Solution of Phosphates (1938), 2 fl.ounces.
Syrup, 1 gallon.

This may be flavored with any flavoring extract if desired, but for general use is best kept plain as an addition to other Syrups, with which it may be mixed equally. It can also be drawn and served with a dash of Lemon, Orange, or Lime Fruit Essence, as wanted.

Another way, which is perhaps as good as any, is to mix 1 part of the Concentrated Solution with 4 parts of Water and add this from a "s squirt " bottle to any desired Syrup to make the combination desired. This does away with the necessity of keeping a variety of Phosphate Syrups already made up.

3361. Pineapple Syrup.

Pineapple Juice, 1 pint.
Fruit Acid, $\frac{1}{2}$ fl.ounce.
Syrup, 5 pints.

Mix them.

An inferior Syrup of Pineapple may also be made with

Pineapple Essence (973), 1 fl.ounce.
Fruit Acid, $\frac{3}{4}$ fl.ounce.
Syrup, 1 gallon.

3362. Pineapple Phosphate Syrup.

Concentrated Solution Phosphates (1938), 1 fl.ounce.
Pineapple Juice, 1 pint.
Syrup, 5 pints.

Mix them.

3363. Plum or Prune Syrup.

Plum or Prune Juice, 1 pint.
Syrup, 5 pints.

Mix them.

An inferior Syrup may be made from

Plum or Prune Essence (974 or 975), 1 fl.ounce.
Fruit Acid, 1 fl.ounce.
Syrup, 1 gallon.

3364. Quince Syrup.

Quince Juice,	1	pint.
Fruit Acid,	$\frac{1}{2}$	fl.ounce.
Syrup,	5	pints.

Mix them.

A very good imitation of Quince may be made with

Quince Essence,	1	fl.ounce.
Fruit Acid,	$\frac{3}{4}$	fl.ounce.
Syrup,	1	gallon.

3365. Raspberry Syrup, Red or Black.

Raspberry Juice, Red or Black,	1	pint.
Syrup,	5	pints.

Mix them. The Red Raspberry Syrup is considered the finest flavor of any of the fruit syrups. Black Raspberry Syrup has a much different flavor and a very dark color.

An inferior Syrup, imitating Raspberry, may be made with

Raspberry Essence (977),	1	fl.ounce.
Fruit Acid,	1	fl.ounce.
Syrup,	1	gallon.

3366. Raspberry Phosphate Syrup.

Concentrated Solution Phosphates (1938),	1	fl.ounce.
Raspberry Juice,	1	pint.
Syrup,	5	pints.

Mix them. This is one of the finest flavored Phosphate Syrups.

3367. Rose Syrup.

Rose Essence (920),	1	fl.ounce.
Syrup,	1	gallon.

Mix them. Color light red with Red Coloring.

3368. Sarsaparilla Syrup.

Sarsaparilla Essence (923),	$1\frac{1}{2}$	fl.ounce.
Fruit Acid,	$\frac{1}{2}$	fl.ounce.
Syrup,	1	gallon.

Mix, and color brown with Caramel.

This Syrup is improved by adding 1 drachm of Glycyrrhizin in scales, dissolved in a little water. A perfectly clear Syrup may be made with

Soluble Extract Sarsaparilla (949),	3	fl.ounces
Fruit Acid,	$\frac{1}{2}$	fl.ounce.
Syrup,	1	gallon.

Color with Caramel.

3369. Sherbet Syrup.

Vanilla Extract (940),	1 fl.ounce.
Pineapple Juice,	1 pint.
Lemon Extract, Soluble (945),	1 fl.ounce.
Syrup,	5 pints.

This may also be mixed extemporaneously from the fountain by drawing equal parts of Vanilla, Pineapple, and Lemon or Orange Syrups.

This may be made also with

Sherbet Extract (935),	1 fl.ounce.
Syrup,	1 gallon.

3370. Persian Sherbet.

This is usually served by drawing into a glass sufficient Strawberry or Vanilla Syrup, then adding from "squirt" bottles a few drops each of Lemon Extract, Orange Extract, Fruit Acid, and drawing the water upon them, or, adding ice, drawing most full of water and shaking it with a shaker. Fancy sauce bottles for this purpose are supplied by dealers. The Fruit Acid will be white, the Lemon yellow, and the Orange should be colored a bright red. The manipulation of the drink is an attraction.

3371. Strawberry Syrup.

Strawberry Juice,	1 pint.
Syrup,	5 pints.

Mix them. As the color is usually deficient in Strawberry Juice to satisfy the popular taste, it may be colored slightly with Red Coloring, or by the addition of a little Raspberry Juice, which also improves its flavor.

An inferior Syrup may be made with

Strawberry Essence (980),	1 fl.ounce.
Fruit Acid,	$\frac{3}{4}$ fl.ounce.
Syrup,	1 gallon.

With Red Coloring sufficient.

3372. Strawberry Phosphate Syrup.

Concentrated Solution Phosphates (1938),	1 fl.ounce.
Strawberry Juice,	1 pint.
Syrup,	5 pints.

Mix them. This is the least desirable of the Fruit Phosphate Syrups.

3373. Tea Syrup.

Green Tea, good quality,	2 ounces av.
Boiling Water,	1 pint.
Sugar,	1 $\frac{1}{2}$ pound av.

Infuse the Tea in the boiling Water, strain, and add enough Water to make 1 pint, then dissolve the Sugar in the liquid and add a little Soda Foam.

3374. Vanilla Syrup.

Vanilla Extract (940), 2½ fl.ounces.
 Syrup, 1 gallon.

Mix them.

Vanilla Syrup is one of the most popular soda-water syrups. It is combined with nearly all the other syrups, and drawn with cream is a great favorite. It is necessary that only a pure Vanilla Extract of fine flavor be used for making this Syrup. Inferior or mixed extracts will not draw custom.

3375. Violet Syrup.

Orris Extract (934), 1 fl.ounce.
 Syrup, 1 gallon.

Mix them. This makes a fair imitation of Violet. A true Syrup of Violets may be made by gathering the violet flowers in their season, and macerating with Syrup.

3376. Wine Syrups.

Wine of any kind, 2 pints.
 Syrup, 3 pints.

Mix them.

3377. Wintergreen Syrup.

Wintergreen Essencé (927), 1½ fl ounce.
 Syrup, 1 gallon.

Mix them.

A perfectly clear Syrup may be made with

Soluble Extract Wintergreen (951), 3 fl.ounces.
 Syrup, 1 gallon.

Mix them.

Other Soda Water Syrups, etc.

The foregoing are the regular syrups dispensed at soda fountains, many of them being also useful for other purposes. Besides these, several other drinks are served in various ways in connection with the fountain.

3378. Ice Cream Soda.

This is prepared by drawing the desired Syrup into a glass, adding a large spoonful or more of Ice Cream without flavor, and drawing the gaseous Water upon it. A long-handled spoon is generally put in the glass with

which to stir its contents and sip the beverage or eat the ice cream which rises to the surface; it is therefore frequently called "Spoon Soda."

Any Syrup may be combined in this manner with the Ice Cream, and if properly served it is very nice. The Ice Cream should be liberally used.

3379. Milk Shake.

This has become very popular, special apparatus being provided for shaking it. Ice is first shaved into a tumbler, milk is poured upon it until nearly full, it is then transferred to the shaker, agitated, and then poured back into the glass. The milk may be mixed with a small quantity of any flavored syrup if desired, but is generally preferred without sweetening or flavor. In absence of the patent shakers it may be shaken in the ordinary hand shaker usually at hand. A little soda water may be drawn into it to give it "sparkle."

3380. Milk Punch Shake.

This may be made by shaving ice in a glass, adding the usual quantity of Vanilla or other flavored Syrup, drawing part full of Soda Water, then nearly filling with milk and adding, if desired, a little liquor—Brandy, Rum, Whisky, or Wine—then shaking on the patent shaker or with the hand shaker as directed above. Without the liquor, this may be dispensed as *Temperance Punch*. An egg added is a great improvement.

3381. Fruit Juice Shakes.

Shake drinks may be made with any of the Fruit Juices, as follows. They are similar to lemonade or other *ades*, and give excellent satisfaction. Plenty of ice should be used:

Any Fruit Juice,	1 fl.ounce.
Syrup of the same kind,	2 fl.ounces.

Shave ice in the tumbler and draw "solid" with Soda Water, transfer to the shaker and shake, or shake with hand shaker.

A dash of Lemon Essence, Orange Essence, or Lime Fruit Essence, added to Lemon, Orange, or Lime Fruit Shakes adds to their flavor and makes an attraction. By squeezing the juice from fresh fruit into the glass the attractiveness of the drink is much increased.

3382. Cobbler Shakes.

These are made by mixing in a small, thin glass,

Wine, any kind,	2 ounces.
Lime or Lemon Juice,	½ ounce.
Lemon Syrup,	2 ounces.

Shaving ice in the glass, drawing solid with Soda Water, and shaking as before directed.

3383.

Cocktail Shakes.

These are made by adding to ice shaven in a glass, Brandy, Rum, Whisky, or Gin about 1½ ounce, Lime, Lemon, or Orange Juice ½ ounce, Syrup 1 ounce, a dash of Stoughton Bitters, and then enough Soda Water to fill a small glass, and shaking as directed.

3384.

Egg Phosphate Shake.

Shave ice in a glass, add Lemon or other Fruit Syrup 2 ounces, a dash of Lemon Essence, the contents of 1 Egg, a dash of Acid Phosphate enough to make sour, draw Soda Water in the glass to nearly fill, and then shake as directed.

Other similar drinks with Egg may be prepared in the same way.

3385.

Nerve Foods and Tonics.

Nerve Foods and Nerve Tonics have become very popular beverages at the soda fountain. "*Acid Phosphate*" is extensively used, the original "*Horsfords*" being used by many druggists, but most of them making or buying in bulk a concentrated solution of Phosphates Compound, which may be diluted or made into a syrup as directed.

"*Malto*" is an acid beverage, used as a Nerve Tonic like Acid Phosphate. It is put up in bottles, sweetened and charged with gas, making a sparkling acid drink. A "*Malto Syrup*" is also made, which is to be diluted with 4 parts of Syrup and drawn from the fountain as any other syrup. The "*Acid Phosphate Syrup*" will answer the same purpose as this.

"*Moxie*" Nerve Food is an entirely different preparation. The proprietary "*Moxie*" has had a large sale. A similar preparation for use at the fountain may be prepared and drawn as a syrup like any other syrup, as follows:

Fluid Extract Sarsaparilla Compound,	6 fl.ounces.
Tincture of Gentian Compound,	1 fl.ounce.
Sarsaparilla Extract, Soluble (949),	3 fl.ounces.
Concentrated Solution Phosphates,	2 fl.drachms.
Syrup, to make	1 gallon.

Mix them.

For *Mead*, *Ginger Ale*, etc., see pages 422 to 427.

Hot Soda Syrups.

It is unnecessary to state that the so-called "Hot Soda Water," unlike the cold soda water, contains no gas, but the force is obtained from force of water, and heated in an apparatus specially designed for it.

But comparatively few druggists who have fountains run hot soda water, as the demand is not sufficiently large to pay except in central locations in large towns.

The syrups and drinks which are generally supplied are as follows:

3386. Chocolate Syrup.

Fenner's Perfection Cream Chocolate.

This is kept hot in a tank or bottle from which it can be drawn. A sufficient quantity, say 2 ounces, is poured or drawn in a cup, and the Hot Water drawn upon it. Milk or Cream is usually added before drawing the Water.

Chocolate Syrup may also be made by melting on a water-bath Chocolate 1 pound, Vanilla Chocolate $\frac{1}{2}$ pound together, and adding Hot Syrup 3 quarts, mixing them well together.

3387. Coffee Syrup.

Coffee Extract (932), 1 pint.
Syrup, 3 pints.

Keep this hot in a tank or bottle. It may be served with Cream or hot Milk added, or plain, drawing about 2 ounces of the Syrup in a cup and then drawing the hot Water upon it.

3388. Beef Tea Extract.

Extract of Beef, Liebig's, 4 ounces.
Black Pepper, $\frac{1}{2}$ ounce.
Hot Water, 1 pint.

Infuse the Pepper with the Water for half an hour and strain, then mix the Beef Extract with the liquid.

To make Beef Tea pour a tablespoonful of this into a cup, add a little salt and draw hot Water upon it.

3389. Hot Lemonade.

Lemon Juice, 1 ounce.
Syrup, 1 ounce.

Mix in a cup with a dash of Lemon Essence and draw hot Water upon it. A little liquor—Whisky, Brandy, or Rum—is sometimes added. Lime Juice may be used instead of Lemon.

3390. Hot Egg Phosphate.

This is a shake drink, made by drawing Lemon Syrup, 2 ounces, in a glass, adding 1 Egg and a dash of Acid Phosphate, shake well together, and draw hot Water sufficient to make a glass of the beverage. The Water should not be too hot for this purpose.

Mineral Waters.

It is most convenient to keep Solutions made up for the various artificial Mineral Waters; they can then be mixed at once with the water in the fountain, and charged.

These Solutions are so designed that they represent one gallon of the Mineral Water in 4 ounces of the Solution. Hence, *to make any Mineral Water* for each gallon required, take of the

Solution,	4 ounces.
Water,	1 gallon.

Mix in a fountain, and charge with Carbonic Acid Gas to 60 or 80 pounds.

All of the Solutions do not make up clear, and some of them do not remain clear after they are made; but it is only necessary to shake them before using, as the Carbonic Acid, when charged, dissolves all the sediment.

Keep the Solutions in dark-colored, half-gallon bottles or demijohns, in a cool, dark place. Do not forget to shake them thoroughly just before using.

3391. Apollinaris Water Solution.

Bicarbonate of Sodium,	3 ounces.
Fine Dairy Salt,	3 ounces.
Glauber's Salt (Sulphate of Sodium),	1 ounce.
Carbonate of Magnesium,	1 ounce.
Water, enough to make	4 pints.

Mix them, rubbing the Magnesium salt first through a sieve. Use 4 ounces of the mixture for each gallon of the Water desired, and charge as directed.

3392. Carlsbad Water Solution.

Sulphate of Sodium (Soda),	160 grains.
Carbonate of Sodium (Sal Soda),	40 grains.
Sulphate of Magnesium (Epsom Salts),	20 grains.
Fine Dairy Salt,	20 grains.
Chloride of Calcium,	20 grains.
Tartrate of Iron and Potassium,	2 grains.
Water, enough to make	4 pints.

3393. Congress Water Solution.

Fine Dairy Salt,	1 pound.
Caustic Soda,	46 grains.
Bicarbonate of Potassium,	40 grains.
Calcined Magnesium,	2 ounces.
Water, enough to make	4 pints.

3394. Friedrichshall Water Solution.

Bicarbonate of Sodium,	1 $\frac{1}{4}$ ounce.
Sulphate of Soda (Glauber's Salt),	2 ounces.
Sulphate of Potassium,	$\frac{1}{2}$ ounce.
Fine Dairy Salt,	1 pound.
Sulphate of Magnesium (Epsom Salts),	2 pounds.
Chloride of Calcium,	1 $\frac{1}{2}$ ounce.
Water, sufficient to make	4 pints.

Mix them. Use 4 ounces of the mixture for each gallon of Water desired. Only a small portion of the salts are dissolved; it must be well shaken.

3395. Hunyadi Janos Water.

Epsom Salts,	28 ounces.
Glauber's Salt,	23 ounces.
Fine Dairy Salt,	2 ounces.
Sulphate of Potassium,	1 drachm.
Bicarbonate of Sodium,	$\frac{1}{2}$ ounce.
Sulphite of Lime,	1 $\frac{1}{2}$ ounce.
Water, to make	10 gallons.

This Water is so strong of the Salts that it is not expedient to make a solution, as in the other Waters.

3396. Kissengen Water Solution.

Bicarbonate of Sodium,	2 drachms.
Fine Dairy Salt,	1 pound.
Muriate of Ammonia,	8 grains.
Sulphate of Sodium,	320 grains.
Epsom Salts,	4 ounces.
Phosphate of Sodium,	26 grains.
Carbonate of Magnesium,	1 ounce.
Water, enough to make	4 pints.

Rub the Carbonate of Magnesium through a sieve before adding it to the Solution.

3397. Magnesian Aperient or Citrate of Magnesium Solution.

Citric Acid,	8 ounces.
Carbonate of Magnesium,	8 ounces.
Essence Lemon (945),	4 ounces.

Dissolve the Citric Acid in 2 pints of hot Water, and add the Carbonate of Magnesium, previously rubbed through a sieve. This does not all dissolve.

When effervescence has ceased, add the Essence Lemon, and make up the measure with Water to 4 pints. Use 1 pint of this Solution to each gallon of Water before charging.

This makes an agreeable effective Citrate of Magnesia.

3398. Pullna Water Solution.

Sulphate of Sodium,	1 $\frac{3}{4}$ ounces.
Sulphate of Magnesium (Epsom Salts),	2 $\frac{3}{4}$ ounces.
Carbonate of Sodium,	40 grains.
Chloride of Calcium,	1 drachm.
Chloride of Magnesium,	1 drachm.
Fine Dairy Salt,	1 drachm.
Water, enough to make	4 pints.

3399. Pyrmont Water Solution.

Sulphate of Sodium,	40 grains.
Epsom Salts,	40 grains.
Chloride of Magnesium,	26 grains.
Chloride of Calcium,	100 grains.
Carbonate of Sodium,	180 grains.
Sulphate of Iron,	10 grains.
Water, enough to make	4 pints.

3400. Seltzer Water Solution.

Chloride of Calcium,	1 ounce.
Chloride of Magnesium,	3 ounces.
Fine Dairy Salt,	1 ounce.
Carbonate of Sodium,	4 ounces.
Phosphate of Sodium,	140 grains.
Pyrophosphate of Iron,	30 grains.
Sulphate of Sodium,	1 $\frac{3}{4}$ ounces.
Water, enough to make	4 pints.

Dissolve the Iron in a portion of the Water, mix the other Salts with the rest of the Water, and mix the solutions.

3401. Spa Water Solution.

Carbonate of Sodium,	20 grains.
Chloride of Calcium,	10 grains.
Epsom Salts,	20 grains.
Sulphate of Iron,	6 grains.
Water, enough to make	4 pints.

3402.

Vichy Water Solution.

Sulphate of Potassium,	360	grains.
Sulphate of Sodium,	160	grains.
Phosphate of Sodium,	50	grains.
Fine Dairy Salt,	1 ½	ounces.
Bicarbonate of Sodium,	10 ½	ounces.
Carbonate of Ammonia,	20	grains.
Water, enough to make	4	pints.

3403.

Zoedone.

This is a proprietary drink, containing Iron and Mineral Phosphates in solution. An imitation may be made as follows :

Solution Phosphate of Calcium,	10	fl.ounces.
Phosphate of Iron (1880 scale salt),	1	ounce.
Phosphate of Potassium,	¼	ounce.
Phosphate of Sodium,	40	grains.
Orange Flower Water,	1	pint.
Orange Essence, Soluble (948),	3	fl.ounces.
Syrup,	1 ½	gallon.
Water, sufficient to make	10	gallons.

Mix, and charge in a fountain or bottle.

Directions for other drinks which are charged in fountains will be found under the Extracts from which they are prepared. See pages 421 to 428.

TABELLÆ — TABLETS.

This title is applied rather indefinitely to a variety of preparations, either cut, moulded, or pressed into desired shape and size. Many preparations thus made are also called *Troches* or *Lozenges*, which see. The only official Tablets are *Tabellæ Nitroglycerini* of the Br. P.

3404.

Tabellæ Nitroglycerini.*Tablets of Nitroglycerini.*

Tablets of Chocolate, each weighing 2 ½ grains and containing 1 100 grain of pure Nitroglycerine. The dose is 1 or 2 tablets.

3405. Compressed Tablets.

These are made by compressing the dry medicinal substances, either alone or mixed with powdered Sugar, into round, flattened, convex Tablets or Lozenges. This may be done by a small, hand tablet or pill compressor. Power machines are also made for this purpose, but as they are very expensive they are used only by large manufacturers.

The Tablets as thus prepared are called by various names. Those corresponding to the formulas of well-known pills are called *Compressed Pills* or *Powders*. The small Tablets of Sodium, Ammonium, and Potassium salts, and some others, which are made without addition of sugar, are called *Compressed Tablets*. Those containing a small but definite quantity of active medicine, intended to be dissolved for hypodermic use, are called *Hypodermic Tablets*.

The larger ones, in which the medicinal agent is mixed with sugar or other dilutant, are called *Compressed Lozenges* or *Troches*.

And still another class of very small Tablets, which are made by triturating active medicinal agents with some dilutant (as powdered sugar), and which are intended to insure accuracy of dose, are called *Compressed Triturates*.

As all of these are usually made by manufacturers who have machinery adapted for the business, it is unnecessary to give formulas for them. They are furnished in great variety by John Weyth & Brother, Philadelphia, who were the first to introduce compressed pills, etc., to the trade.

Ordinary *Lozenges* are made by mixing confectioners' Sugar with more or less powdered Tragacanth or other adhesive gum, adding medicinal or flavoring ingredients as desired, and making into a mass with water. The mass is then rolled out and the Lozenges cut in various shapes as desired, and dried in a current of warm air.

3406. Fruit Tablets or Lozenges.

These are supplied by the confectioners in great variety and of various shapes and sizes, being generally moulded convex, oval, or nearly round, or cut in squares. To make first-class Fruit Tablets, the Fruit Juices must be added to melted Rock Candy and the mixture boiled until it is of proper temper. It is then run into or through properly-constructed moulds, such as are used by confectioners, or run into pans and cut into square Tablets.

When made with ordinary sugar, Tablets soon become soft and discolored. It is therefore necessary to use Rock Candy as the basis of the Tablets, Fruit Juice being added sufficient to flavor and color them. Flavoring Extracts are also added just before running in the moulds. Many other Tablets besides those made with Fruit Juices are made in the same manner, Cough Tablets particularly having a large sale. These usually contain some opiate in small quantities, strongly flavored with Oil of Anise or Paregoric, and colored black, brown, or red with Elderberry Juice, Caramel, or Cochineal coloring.

For other Tablets, Troches, or Lozenges, see Troches.

3407. TANNIN OR TANNIC ACID.*Acidum Tannicum.*

This may be prepared from Nutgalls, in fine powder, by first exposing it to a moist atmosphere for 24 hours, then mixing it with sufficient washed Ether to form a soft paste. This is set aside, closely covered, for 6 hours, then enclosed in a strong canvas bag and quickly expressed with power between tinned iron plates, in order to obtain the liquid portion, which is reserved. The cake is then broken up and again treated in the same manner. The liquids are then mixed and allowed to evaporate spontaneously to a syrupy consistence, then spread upon glass plates and quickly dried. This process is too expensive to be employed commercially. Tannic Acid is an abundant constituent of plants, being found in nearly all barks, leaves, and roots, usually associated with glucosides. Tannin that is employed medicinally is obtained from Nutgalls, but for industrial purposes the Solutions of Tannin obtained from Hemlock, Oak, and other barks are extensively used for tanning, converting the gelatin of hides into insoluble tannate of gelatin. This combination is made advantageous in making many elixirs and other medicinal preparations from substances containing Tannin, as by the addition of Gelatin or Albumen it is removed, leaving them free to combine with Iron or other salts, which would otherwise be precipitated or discolored if not removed.

Chemically, Tannin is now considered an Anhydride of Gallic Acid. In medicine, Tannin is used as an astringent, both internally and externally. The dose is 3 to 10 grains.

3408. Gallic Acid — *Acidum Gallicum* — $\text{HC}_7\text{H}_5\text{O}_5 \cdot \text{H}_2\text{O}$. — This is prepared from Nutgalls by mixing the powder with Water to form a thin paste and exposing the mixture in a shallow dish for one month to a warm atmosphere, stirring occasionally, with addition of Water. The mass is then expressed and the liquid rejected, the cake being then boiled with Water and the solution filtered through animal charcoal. The liquid is then concentrated and set aside for crystals to form. Gallic Acid is used in medicine as an astringent, in doses of 5 to 15 grains.

3409. Pyrogallic Acid — *Acidum Pyrogallicum* — $\text{C}_6\text{H}_6\text{O}_3$. — This is prepared by subliming Gallic Acid. It is used in making hair dye and in some photographic operations.

TELLURIUM.

Symbol, Te; Atomic weight, 128.

This is an elementary substance, classed with the non-metals. It is found only in small quantities associated with bismuth, gold, silver, and lead, chiefly in the gold mines of Transylvania. It is a grayish-white substance resembling bismuth, and having, when decomposed, like arsenic, the odor of garlic.

With Oxygen it forms two Oxides, TeO_2 Tellurium Dioxide and TeO_3 Tellurium Trioxide, which, uniting with the elements of Water, form *Tellurous Acid*, H_2TeO_3 , and *Telluric Acid*, H_2TeO_4 . It also forms, with Hydrogen, a gaseous compound, *Telluretted Hydrogen*, H_2Te , similar in characteristics to Sulphuretted Hydrogen.

The Acids of Tellurium form salts with bases, but they have no practical use in pharmacy or medicine.

THALLIUM.

Symbol, Tl; Atomic weight, 203.7; Sp. gr., 11.8.

This is an elementary metal, discovered by Crooks, in 1861, similar in characteristics to mercury, silver, and lead. It is found in iron and copper pyrites and native sulphur. It is not employed in pharmacy or medicine.

3410.

THERIACA. Br.

Treacle.

The uncrystallized residue of the refining of Sugar, or what is known in this country as "Golden Syrup," is official in the Br. P. under the above title. In ancient pharmacy a variety of confections or electuaries were known by this name and employed as antidotes to infections or poisons. They were

composed of a great number of ingredients, the *Theriaca Andromachi* of the Ph. L., 1746, containing over 60 substances, with 1 grain of Opium in 75. The *Electuaire Thériaque* or *Theriaca* of the Paris codex contains 72 ingredients, with 1 grain of Opium in 72 grains. *Confectio Damocratus*, *Mithridate*, *Philonium Romanum*, the *Opiate of Solomon* (see, also, 464), and some others are compounds of a great number of aromatics, similar to the *Thérique* of the Paris codex, but are now unused, ordinary molasses, syrup, or honey being used when *Theriaca* or *Treacle* is directed.

TINCTORA — DYES.

Since the introduction of Aniline Dyes, put up in packages for coloring, the sale of other dyes, which was once quite a feature of the drug business, has much decreased, but there is still considerable demand for coloring substances aside from the package Dyes. The principal substances used for this purpose are therefore mentioned and a few recipes for coloring given.

3411. Alizarin — $C_{15}H_6O_3 \cdot 2H_2O$.— This preparation, which is also called *Lazaric Acid* or *Madder Red*, was formerly obtained from Madder by exhausting it with boiling Water, precipitating with Sulphuric Acid, washing the precipitate and, while moist, boiling it with a concentrated Solution of Hydrate of Aluminium in Hydrochloric Acid, then mixing the solution with Hydrochloric Acid, when red flakes of impure Alizarin are deposited. This is then purified, recrystallized, etc.

It is now artificially prepared from a coal tar product called *Anthracen*, by several complicated processes, and the cultivation of the Madder plant, *Rubia Tinctorum*, which was once a very important industry, has very much decreased.

The Madder colors, of which Alizarin is the most important, are extensively used for dyeing calicoes, which are familiarly known as Madder prints. *Turkey Red* is one of the most brilliant colors produced with this substance, but by combining it with other colors a great variety of colors are produced.

3412. Annato — *Arnatto* or *Orellana*.— This is a coloring matter obtained from outer pellicle of the seeds of *Bixa Orellana*, by macerating the crushed seeds or seed pods in Water for several weeks and collecting the pulpy mass, purifying and concentrating to a stiff extract by evaporation. This is used

for coloring orange or yellow, *nankeen* being a familiar color produced by it. It is also extensively employed for coloring butter, cheese, etc.

Annattoine is the principal coloring matter of Annatto.

3413. Archil—Orchil.—This is a violet-red, purple, or blue coloring matter obtained from several species of lichens, the finest being from *Rocella Tinctoria*. As found in the market it is a liquid paste, which is either blue or red or violet color, as it contains more or less alkali or acid. It is of the same nature and derived from a similar source as *Cudbear* and *Litmus*, all being prepared from lichens collected on rocks near the sea, which are ground into a pulp with Water, Ammoniacal liquors added, and, after standing for some time, the dissolved coloring matter expressed, filtered, precipitated with Tin Solution, purified, redissolved, etc.

Cudbear is Archil paste, made by grinding the weeds and treating with Ammonia, dried and ground, and usually much adulterated with salt or other inert substance.

Litmus is blue Archil mixed with some inert substance, as chalk, or boiled with the pith of some plants which absorb the coloring matter. The former is in the form of a cake and the latter in the form of small flattened cubes, in which shape the absorbing substance is cut before saturating with the Archil solution. Solution of Litmus is used as a test for acids, etc. (See page 231.) Archil, Cudbear, and Litmus are used for coloring purple, violet, red, and blue.

3414. Carmine.—This is an important coloring matter, obtained from Cochineal, *Coccus Cacti*, by precipitating its decoction with various acid salts, or by other treatment, which is employed by experienced workmen. It is soluble in Ammonia and alkaline solutions. It is chiefly employed as a pigment in solution as *Liquid Rouge*, *Carmine Ink*, etc., but Cochineal, from which it is derived, is extensively used for dyeing, yielding the finest scarlet red, which is durable and permanent.

3415. Carthamin— $C_{14}H_{16}O_7$ —*Pure Rouge*.—This is the red coloring matter obtained from Safflower, *Carthamus Tinctorius*, by treating it repeatedly with a weak solution of Carbonate of Sodium and then precipitating the coloring matter with excess of Citric or Acetic Acid. The Safflower Carmine precipitated is then collected, washed, and dried.

Pink Saucers, which are a well-known article in the toilet trade, are made by covering the inside of white saucers with Carthamin.

Rouge, which is sold as a toilet requisite, is Carthamin, either alone or prepared in the form of a paste or powder, with other substances.

Safflower is also used for coloring orange.

3416. Indigo.—A blue dyestuff, extracted from different species of *Indigofera*, by immersing them in Water and allowing to ferment. The *Chromogene* contained in the plants is first dissolved, then by the action of the air becomes oxidized, precipitating an insoluble coloring matter, which is collected, pressed, and dried, and is known as *Indigo*. It contains a variety of

principles, the most important of which is *Indigotin* or Indigo-blue, which is present to the extent of 50 to 60 per cent. Indigo is extensively used in dyeing blue and for blueing clothes.

3417. Indigo Sulphate or Soluble Indigo.—This is prepared by gradually adding 1 part of best powdered Indigo to 5 parts of Nordhausen Sulphuric Acid or 8 parts of Commercial Sulphuric Acid, keeping the mixture cooled by immersing in cold water until combined, then heating for 10 or 12 hours. After standing a few days it becomes a dark pasty mass, which is known by the above names; also called Chemic Blue, Indigo Compound, Extract of Indigo, Indigo Paste, etc.

This is used for dyeing, for making some kinds of liquid blueing, etc.

3418. Lac Dye.—In the preparation of Shellac from stick-lac or seed-lac, it is boiled with Water, which dissolves the red coloring matter of the insect which produces it. This is precipitated by Alum and is called *Lac Dye*. It is used for coloring red and purple.

3419. Extracts Used for Dyeing.—Many Extracts of Woods and other substances are now used for dyeing where formerly the substances themselves were employed. This arises from the greater convenience of employing concentrated preparations, decreased cost of transportation, superior facilities for extracting, etc.

Catechu, also called *Cutch* and *Terra Japonica*, is a native Extract prepared from the dark or heart-wood of *Acacia Catechu*. For small retail trade the purified Catechu, put up in boxes, is now generally sold. *Extract of Logwood* and *Extract of Fustic*, put up in a like manner, are also much sold in a retail way for domestic coloring. Extracts of other woods or like coloring substances are not generally sold by druggists, but are extensively prepared and used by dyers, the process being to percolate the ground woods, etc., with boiling water to exhaust them of their soluble coloring, then evaporate them to the proper consistence.

Many woods, flowers, barks, roots, and other natural, vegetable, and chemical substances are used for coloring, but it is unnecessary to mention them here.

Recipes for Coloring.

To give intelligent recipes for dyeing different kinds of fabrics in different ways would fill a volume, and it is impossible, in this limited sketch, to give even an outline of the recipes and processes used; but for convenience of druggists, who are often called upon for information in this line, a few only of the simple recipes used for domestic dyeing or coloring are given. The quantities directed are for 1 pound of goods. A larger quantity requires less in proportion.

3420. Black — For Woolen Goods.—Extract of Logwood 2 ounces, Blue Vitriol 1 ounce. Dissolve them separately in hot rain or soft Water about 1 gallon. Dip the goods first in the solution of Blue Vitriol and, after a few

moments, take out, drain, and add the solution of Blue Vitriol to the solution of Logwood Extract, then add the goods and keep the dye at a scalding heat for twenty minutes, working the goods occasionally, then take out, drain, and set the color by dipping in a hot bath of 3 gallons of Water in which a tea-cupful of salt is dissolved. Let the goods remain in the bath until cold.

For Silk Goods, dye in the same manner, but to set the color dip in boiling soap-suds instead of the salt solution.

For Cotton Goods, boil the goods with the dye, with constant stirring, and set the color the same as for woollen goods.

This is the ordinary Logwood-Black dye. One pound of Logwood chips may be used instead of the extract. Other blacks may be used, but this is the best for domestic dyeing.

3421. Blue — *For Woollen Goods*.— Alum $2\frac{1}{2}$ ounces, Cream Tartar $1\frac{1}{2}$ ounce. Dissolve in 1 gallon of Water and boil the goods for 1 hour in the solution, then dip them into a mixture of Indigo Sulphate (3415) and Water, using sufficient of the Indigo preparation to get the desired shade of blue. A larger quantity, say $1\frac{1}{2}$ ounce, making a dark blue; less quantity a light blue.

For Silk Goods, the same dye as for woollen may be used, but finer shades of color are produced with the Aniline dyes.

For Cotton Goods. Prussian Blue, in powder, 1 ounce, Oxalic Acid $\frac{1}{2}$ ounce. Dissolve them in just sufficient Water to cover the goods, and dip the goods in the dye, working it well in by hand until well colored, then wring out and dip in Alum Water to set the color.

This dye is also made by dissolving Prussiate of Potassium 1 ounce, Copperas (Sulphate of Iron) 1 ounce, each separately, in boiling Water, mixing the solutions, adding $\frac{1}{2}$ ounce Sulphuric Acid, dipping the goods in the dye and setting the color with Alum Water.

3422. Brown — *For Cotton, Wool, or Silk*.— Catechu 4 ounces, Bichromate of Potassium 1 ounce, each dissolved separately in sufficient Water to dip the goods. Boil the goods first in the solution of Catechu, then dip in the solution of the Potash salt. A great variety of Browns may be made with Catechu by adding Copperas, Blue Vitriol, Acetate of Lead, etc. This dye is used for dyeing carpet work and for dark browns on wool and silk. For fine browns for silk Aniline dyes are generally used.

3423. Green — *For Woollen Goods*, first color yellow with $3\frac{1}{2}$ ounces Alum and 1 pound of Fustic Wood, or 2 ounces Extract of Fustic, steeped in hot Water enough to cover the goods. When a good yellow is obtained by this dye, strain the liquid from the chips (if Fustic chips are used) and add Indigo Compound to the liquid sufficient to make the desired color, rub the goods well with the dye and rinse in Alum Water.

For Silk Goods, color in the same way and set the color with hot soap-suds.

For Cotton Goods, first color blue as directed (3421), then dip in the yellow (3430) until a fine green is obtained.

3424. Maroon.—Cudbear 2 ounces, steeped in Water sufficient to cover the goods, Alum 4 ounces, dissolved in 1 gallon hot Water. Dip the goods in the Alum Water, then in the Cudbear Solution. If a deep color is desired dip in a solution of 1 ounce Bichromate of Potash in half a gallon of hot Water. This colors nicely on woolen goods but not very well on cotton. For silk the finer Aniline dyes are generally used.

3425. Orange—*For Woolen Goods.*—Quercitron Bark 4 ounces, Lac Dye $1\frac{1}{2}$ ounce. Soak them in hot Water and add Madder Compound $1\frac{1}{2}$ ounce, boil for 10 minutes, then put in the goods and boil for half an hour. By combining yellows and reds a variety of orange shades, ranging from yellow to reddish may be made.

For Cotton Goods.—Dissolve Sugar of Lead, 2 ounces, in sufficient hot soft Water to well cover the goods; dissolve Bichromate of Potash, 1 ounce, in Water enough to cover, then dip the goods first in the Lead Water, then in the solution of Bichromate of Potash. This makes a yellow color, which is changed to orange by dipping the goods carefully in a clear, weak solution of Lime (Lime Water), then rinsing in clear Water.

3426. Salmon or Nankeen—*For Cotton or Woolen Goods.*—Annatto 1 ounce, dissolve in sufficient hot Water to cover the goods, add sufficient Soft Soap to make a suds and boil the solution for 10 minutes, then add the goods and keep at a scalding heat for half an hour, then remove and rinse in cold soft Water.

3427. Red, Madder—*For Woolen Goods.*—Madder, best quality, $\frac{1}{2}$ pound, soak over night in a copper or brass kettle, then add 1 ounce Madder Compound. After standing a little while add the goods and bring slowly to a scalding heat. Leave in the dye until the desired shade of color is produced, then rinse in clear Water. It is necessary for the goods to remain some time in the dye to obtain a fine color. This makes a deep-red color but bright.

Cochineal Scarlet, for silk or woolen. Cochineal, in fine powder, 1 ounce, Cream of Tartar 1 ounce, Madder Compound 2 ounces, Water sufficient to cover the goods. Put the Cream Tartar in the Water, boil for a few moments, add the Cochineal and then the Madder Compound, boil for 5 minutes, then add the goods and boil together for about an hour or until a bright scarlet color is obtained, then rinse thoroughly in clear Water. This is the brightest and most durable red. The Aniline reds are very fine but discharge their color when washed.

Fine reds cannot be made on cotton except by experienced dyers. Turkey Red is made from Madder but requires peculiar manipulation. A fair red for cotton may be made by steeping Camwood in Water and adding Muriate of Tin.

Pink may be made by diluting the Cochineal Dye with Water to obtain the desired shade. *Eosin*, an Aniline dye, makes a fine pink. Strong solution of Eosin is used for red ink, making the most brilliant red ink known.

3428. Purple.— A common purple may be made by first dyeing blue as directed (3419), then dipping in Cudbear or Madder Red Dye, but finer shades are made with Aniline dyes.

3429. Violet.— On silk and woolen goods, good violet colors may be made by first coloring with red and then with blue. A Logwood violet is also made by adding acid freely to Logwood Lye.

Fine violets are obtained from Aniline dyes.

3430. Yellow — *For Woolen Goods.*— Alum 2 ounces, Madder Compound 1 ounce, Fustic 8 ounces or Extract of Fustic 1 ounce. Dissolve the Alum in a small quantity of hot Water and add the Madder Compound, boil the Fustic 1 hour in a sufficient quantity of Water, strain the liquor from the chips and add the solution of Alum, etc. Boil together a few minutes and then put in the goods and boil for one hour, then rinse.

For Cotton Goods.—Sugar of Lead 2 ounces, Bichromate of Potash 1 ounce. Dissolve the Sugar of Lead in sufficient hot rain Water as will cover the goods, and the Bichromate in sufficient cold Water. Dip the goods first in the Lead Water, then in the solution of Bichromate until the color is satisfactory.

The foregoing include most of the colors which are generally used for domestic dyeing, except the Aniline package dyes, which are now extensively used for small work, and of which there is a great variety.

TINCTURÆ — TINCTURES.

Tinctures are solutions of medicinal substances in an Alcoholic or Hydro-alcoholic menstruum, differing from spirits chiefly in being prepared from non-volatile substances.

They are the most used of any class of official preparations, and it is highly important that they should be well made, of the best material, and up to the highest standard of strength.

The directions for making Tinctures in the U. S. 1880 Pharmacopœia are much more definite than in former revisions. Many Tinctures that were formerly prepared by percolation are now, very sensibly, prepared by maceration, and in most of the present formulæ, where percolation is employed, it is directed to moisten the drug and macerate it for 24 hours before packing in the percolator. This is a very important direction, for, in following the former authority, it was often the case that inexperienced druggists would pack the drugs in the percolator and begin percolating at once, having a tincture finished in a few hours, which would, of course, only partly

represent the medicinal value of the drug. By moistening the drug and allowing it to stand before packing, it has an opportunity to "swell" and gives time for the medicinal properties to be dissolved or loosened, and it is therefore in a fit condition for the process of percolation.

Of all processes, however, which have been proposed for making Tinctures, none will be found so valuable and economical as the process of water-bath percolation, which, by the influence of heat, dissolves and removes with the percolate, all the medicinal value of the drug. The formulæ that are given for making Tinctures by water-bath percolation mostly conform to the standard of strength of the 1880 Pharmacopœia.

The change in the U. S. 1880 Pharmacopœia to parts by weight, instead of definite weight and fluid measure, as formerly, causes much inconvenience to American druggists who are not accustomed to preparing them in this manner. This is especially the case with Tinctures, owing to their varying specific gravity and the varying amount of extractive matter which even the same drug will yield by different methods of exhaustion.

The Tinctures of American Pharmacy are now mostly made to represent 5, 10, 15, or 20 per cent. of the medicinal substance, there being but few variations to this general rule. Those of British Pharmacy mostly represent 5, 10, 12½, and 20 per cent., while those of German and French Pharmacy are all in decimal proportion.

The official formulas which follow, therefore, are arranged for definite weight and measure as well as in parts. The formulas of the Br., German, and many of those of the French Pharmacopœias are given as well as the U. S., for in this country they are frequently called for. The following are those official in the authorities mentioned :

343I. *Tinctura Absinthii.* G. P.

Tincture of Wormwood.

Wormwood,	1 part.
Diluted Alcohol,	5 parts.

Make a Tincture by maceration or percolation.

3432.

Tinctura Aconiti.*Tincture of Aconite.*

The U. S. P., 1880, formula is:

Aconite (Root), 400 parts or 11 ounces av.
 Tartaric Acid, 4 parts or 48 grains.
 Alcohol, sufficient to make 1000 parts or 2 pints.

Moisten the powder with 6 fl.ounces of Alcohol in which the Tartaric Acid has previously been dissolved, and macerate for 24 hours; then pack it firmly in a cylindrical glass percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. This Tincture contains 40 per cent. of Aconite.

MADE BY WATER-BATH PERCOLATION.

Aconite Root, in No. 60 powder, . . 11 ounces av.
 Tartaric Acid, 48 grains.
 Alcohol, sufficient to make 2 pints.

Moisten the Aconite with 6 ounces of Alcohol and pack it very firmly in the water-bath percolator. Pour upon it a pint of Alcohol and set in a warm place for 4 days, then heat moderately and, after 1 hour, begin to percolate slowly, adding Alcohol to the drug and continuing the heat and percolation until 2 pints have passed. Dissolve the Tartaric Acid in the Tincture and filter.

The Alcohol remaining in the drug after percolation may be recovered by distillation, and used in liniments, etc.

The Br. P. formula is Aconite Root $2\frac{1}{2}$ ounces av., Rectified Spirit 20 fl.ounces, made in the same manner, the finished Tincture representing 10 per cent. of the drug.

The German official is made 1 part of the Root with 10 parts of diluted Alcohol.

The French *Alcoolature d'Aconit* is made from the fresh Root and 90 per cent. Alcohol, equal parts, by maceration and expression.

The U. S. Tincture of Aconite is given as an arterial sedative in doses of $\frac{1}{2}$ to 5 minims. Three or four times as much of the Br. or German preparations may be given.

Tincture of Aconite Leaves is also kept in most drug stores, and frequently prescribed or called for, although not official; much care must, therefore, be used to prevent mistakes that might occur from misunderstanding as to the two preparations.

This was formerly official in the U. S. P., made with 1 part Aconite Leaves and 8 parts diluted Alcohol. The dose was 5 to 15 grains.

3433. Fleming's Tincture of Aconite.—This is a stronger Tincture of Root prepared by macerating Aconite Root, in fine powder, 16 ounces av., with 1 pint of Alcohol, for five days, then transferring to a percolator and adding Alcohol, percolating slowly until 24 fl.ounces are obtained. This is double the strength of the official Tincture.

3434. Etherial Tincture of Aconite (Paris Codex) is made by macerating or percolating 4 parts of Aconite Root with 16 parts (by weight) of Ether. It is used externally.

3435. Tinctura Aloes.

Tincture of Aloes.

Purified Aloes,	10 parts or $3\frac{1}{4}$ ounces av.
Extract of Liquorice,	10 parts or $3\frac{1}{4}$ ounces av.
Diluted Alcohol, sufficient	
to make	100 parts or 2 pints.

Mix the powders with a pint and a half of diluted Alcohol, and macerate the mixture for seven days in a closed vessel; then filter through paper, adding through the filter enough diluted Alcohol to make the Tincture measure 2 pints. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Purified Aloes, in moderately fine	
powder,	$3\frac{1}{4}$ ounces av.
Extract of Liquorice, in moderately	
fine powder,	$3\frac{1}{4}$ ounces av.
Diluted Alcohol, sufficient to make	2 pints.

Mix the drugs and agitate them with 28 fl.ounces of diluted Alcohol; cut a piece of burlap or coarse cloth and place in the bottom, on the perforated diaphragm of the water-bath percolator. Pour the mixture into the percolator and let it stand in a warm place for two days; then heat moderately, and, after one hour, begin to percolate, adding diluted Alcohol through

the percolator to make 2 pints of the Tincture. A little sediment will be found at the bottom after the Tincture has cooled, as the warm diluted Alcohol dissolves a little more of the drugs than it will retain in solution. Forty grains of Carbonate of Potassium then added to the Tincture will nearly dissolve the precipitate and will greatly improve the preparation.

The Br. P. formula is Socotrine Aloes $\frac{1}{2}$ ounce av., Extract of Liquorice $1\frac{1}{2}$ ounce av., Proof Spirit a sufficiency. Macerate for seven days in 15 fl.ounces of the Spirit, then filter and add sufficient Proof Spirit through the filter to make 20 fl.ounces.

The G. P. formula is Aloes 1 part, Alcohol 5 parts, prepared in the same manner.

The U. S. Tincture of Aloes is given as a purgative in doses of $\frac{1}{2}$ to 1 fl.drachm or more.

3436. Tinctura Aloes Composita. G. P.

Elixir ad Longam Vitam.

Aloes 6 parts, Rhubarb, Gentian, Zedoary, Saffron, each 1 part, diluted Alcohol 200 parts. Make a Tincture by maceration.

3437. Tinctura Aloes et Myrrhæ.

Tincture of Aloes and Myrrh (Elixir Proprietatis).

Purified Aloes, 10 parts or $2\frac{7}{8}$ ounces av.

Myrrh, 10 parts or $2\frac{7}{8}$ ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Mix the powders with $1\frac{1}{2}$ pint of Alcohol and macerate the mixture for seven days in a closed vessel, then filter through paper, adding through the filter enough Alcohol to make the Tincture measure 2 pints. U. S. 1880.

This may also be made by water-bath percolation in the same manner as is directed for making Tincture Aloes (3435).

It is given as a laxative and regulator and for worms, etc. The dose is 30 minims to a teaspoonful or more.

3438. Tinctura Amara. G. P.*Bitter Tincture — Bittertropfen.*

This is prepared by maceration or percolation from Gentian, Centaury, each 3 parts, Orange Peel 2 parts, Orange Berries, Zedoary, each 1 part, diluted Alcohol 50 parts. It is an aromatic bitter.

3439. Tinctura Arnicæ Florum.*Tincture of Arnica Flowers.*

Arnica Flowers, 20 parts or $6\frac{1}{4}$ ounces av.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Moisten the Arnica Flowers with 12 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Arnica Flowers, in coarse powder, . . 6 ounces av.
 Alcohol, 22 fl.ounces.
 Water, sufficient to make 2 pints.

Moisten the Arnica with 8 ounces of Alcohol and pack very firmly in the water-bath percolator, pour upon it the remaining 14 ounces of Alcohol and set in a warm place for one day, then heat moderately and, after one hour, begin to percolate, adding Water to the drug in the percolator after the Alcohol has disappeared and continuing the heat and percolation with Water until 2 pints of the Tincture are obtained. Let it stand for a few days and filter.

The Arnica Flowers can best be reduced to a coarse powder by rubbing them through a coarse sieve. It will be noticed that the proportion of Alcohol is greater than the 1880 Pharmacopœia directs, but it has been found necessary to use a larger quantity in order to retain the properties in solution, as

by water-bath percolation a much stronger Tincture is made than by the ordinary method.

The German formula directs 1 part of the Flowers to 10 parts of diluted Alcohol.

Tincture of Arnica is chiefly used externally.

3440. *Tinctura Arnicæ Radicis.*

Tincture of Arnica Root.

Arnica Root, in No. 40

powder, 10 parts or $3\frac{1}{8}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of the Tincture are obtained. U. S. 1880.

The Br. formula is essentially the same.

When this Tincture is desired by physicians it should be so stated in the prescription. If "Tincture Arnica" only is written the Tincture of Arnica Flowers should be dispensed.

MADE BY WATER-BATH PERCOLATION.

Arnica Root, in No. 40 powder, . . . 3 ounces av.

Diluted Alcohol, sufficient to make . 2 pints.

Moisten the drug with 3 ounces of diluted Alcohol and pack firmly in the water-bath percolator, pour upon it 24 ounces of diluted Alcohol and set in a warm place for 24 hours, then heat moderately and, after one hour, begin to percolate, adding diluted Alcohol to the drug and continuing the heat and percolation until 2 pints of the Tincture are obtained.

3441. *Tinctura Aromatica.* G. P.

Aromatic Tincture.

This is prepared by maceration or percolation from Cinnamon 5 parts, Ginger 2 parts, Galangal Root, Cloves, Cardamom, each 1 part, and diluted Alcohol 50 parts. It is used as an aromatic addition to other preparations.

3442. Tinctura Asafœtidæ.*Tincture of Asafetida.*

Asafetida, bruised, . . . 20 parts or 5½ ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Mix the Asafetida with a pint and a half of Alcohol and macerate for seven days in a closed vessel, then filter through paper, adding enough Alcohol through the filter to make the Tincture measure 2 pints. U. S. 1880.

This Tincture may be made by water-bath percolation in the same manner as Tincture of Aloes, but, as it is so difficult to clean a vessel in which it is made, it may not be advisable to use a water-bath percolator for this purpose. It is most convenient to keep a wide-mouth jar expressly for making Tincture of Asafetida, allowing it to macerate for an indefinite time and filtering off a pint, more or less, as is required to fill the shelf bottle.

The German preparation is the same as the U. S.

The Br. P. directs 2½ ounces av. of the Gum-Resin to make 20 fl.ounces with Rectified Spirit.

The dose is ½ to 1 fl.drachm as an anti-spasmodic.

3443. Tinctura Aurantii Amari.*Tincture of Bitter Orange Peel.*

Bitter Orange Peel, . . . 20 parts, or 6¼ ounces av.

Diluted Alcohol, sufficient

to make . . . 100 parts or 2 pints.

Moisten the powder with 6 ounces of Diluted Alcohol and macerate for 24 hours; then pack it moderately in a conical percolator and gradually pour Diluted Alcohol upon it until 2 pints of the Tincture are obtained.

MADE BY WATER-BATH PERCOLATION.

Bitter Orange Peel, in No. 30 powder, . . 6 ounces av.

Diluted Alcohol, sufficient to make . . 2 pints.

Moisten the drug with 6 ounces of Diluted Alcohol and macerate in a closed vessel for 24 hours, then pack moderately

in the water-bath percolator, pour upon it a pint and a half of Diluted Alcohol and set in a warm place for 24 hours. Then heat very moderately and after one hour begin to percolate, adding Diluted Alcohol to the drug and continuing the heat and percolation until 2 pints of the Tincture have passed. Set this aside for a few days to allow the albuminous matter to separate, and then filter. The Br. and German formulas are the same as the U. S.

This is given as an aromatic bitter in doses of a teaspoonful or more.

3444. *Tinctura Aurantii Dulcis.*

Tincture of Sweet Orange Peel.

Sweet Orange Peel recently
separated from the fresh
fruit and deprived of the

inner white layer, . . . 20 parts or 6 ounces av.

Alcohol, sufficient to make . 100 parts or 2 pints.

Mix the Orange Peel previously cut into small pieces with 80 parts or 1½ pints of Alcohol, and macerate for 24 hours, then pack it moderately in a conical percolator, and gradually pour Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

This is a new officinal tincture used chiefly for flavoring other preparations. The short time which is given for maceration seems insufficient, and certainly is unless the peel is cut very fine and bruised so as to rupture the oil cells as much as possible. It will be much better to add the Alcohol to the peel, chopped very fine, and allow it to remain upon it, instead of percolating as directed. After standing a few weeks it may be filtered off for use. The Br. P. *Tinctura Aurantii Recentis* is similar to this, but stronger.

3445. *Orange Fruit Tincture.*

Oranges, medium size, sweet, No. 12, or 4 pounds av.

Alcohol, 4 pints.

Water, sufficient.

Peel the Oranges as you would an apple, taking off a peeling thick enough to contain all the oil cells, squeeze out the juice of the Oranges with a lemon

squeezer, chop or cut the peel fine and put in a wide-mouth jar or other convenient vessel, pour upon it the Alcohol and expressed juice of the Oranges, macerate for a week or more, add 2 pints of Water and macerate again for a week, then pour off the liquid, pack the macerated peel in a funnel or percolator, and percolate it, first with the poured off liquid, then add Water enough through the drugs to make the measure a gallon. If cloudy when filtered add a very little Alcohol.

This is a finely-flavored preparation and may be used whenever Tincture of Sweet Orange is directed. It is far superior to any other Tincture of Orange. It should be made when oranges are cheap in sufficient quantity to last a year.

3446. *Tinctura Belladonnæ.*

Tincture of Belladonna.

Belladonna Leaves, . . . 15 parts or 4¾ ounces av.

Diluted Alcohol, sufficient

to make . . . 100 parts or 2 pints.

Moisten the powder with 6 fl.ounces of Diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

This may be made by water-bath percolation in the same manner as is directed for making Tincture Arnica Root.

The Br. P. formula directs only 1 ounce of the drug with 20 of Proof Spirit, the product being only about one third as strong as the U. S.

The U. S. Tincture is a narcotic poison, acting as a sedative in small doses. The dose is 3 to 10 minims.

3447. *Tinctura Benzoini.*

Tincture of Benzoin.

Benzoin, 20 parts or 6 ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Mix the powder with a pint and a half of Alcohol and macerate for seven days in a closed vessel, then filter through paper, adding through the filter enough Alcohol to make the Tincture measure 2 pints. U. S. 1880.

The German Tincture Benzoës is the same.

This may be made by water-bath percolation in the same manner as is directed for making Tincture Aloes.

This is used in making some other preparations and in making Aromatic Lotions, etc.

3448. Tinctura Benzoini Composita.

Compound Tincture of Benzoin.

Benzoin,	12 parts or	3¼ ounces av.
Purified Aloes,	2 parts or	236 grains.
Storax,	8 parts or	2¼ ounces av.
Balsam of Tolu,	4 parts or	1⅛ ounce av.
Alcohol, sufficient to		
make	100 parts or	2 pints.

Mix the gums, etc., with a pint and a half of Alcohol and macerate the mixture for seven days in a closed vessel, then filter through paper, adding enough Alcohol through the filter to make the Tincture measure 2 pints. U. S. 1880.

This may be made by water-bath percolation in the same manner as directed for making Tincture of Aloes.

The Br. P. formula is Benzoin 2 ounces av., Prepared Storax 1½ ounce av., Balsam Tolu ½ ounce av., Socotrine Aloes 160 grains, Rectified Spirit to make 20 fl.ounces.

This Tincture was once a popular panacea known as "*Friar's Balsam*."

The dose is ½ to 1 fl.drachm on sugar or in sweetened water.

3449. Tinctura Bryoniæ.

Tincture of Bryonia.

Bryonia, recently dried, in

No. 40 powder, 10 parts or 2¾ ounce av.

Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 3 fl.ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

This Tincture may also be made by water-bath percolation in the same manner as is directed for making Tincture Aconite Root.

It is used as a hydrogogue cathartic in doses of 1 to 2 fl.drachms.

3450. Tinctura Buchu. Br.

Tincture of Buchu.

Buchu Leaves, in No. 20 powder, . . . 2½ ounces av.

Proof Spirit, 20 fl.ounces.

Macerate the Buchu for 48 hours in 15 fl.ounces of the Spirit in a closed vessel, agitating occasionally, then transfer to a percolator and, when the fluid ceases to pass, continue the percolation with the remaining 5 fl.ounces of Spirit, press the drugs remaining in the percolator, filter the liquids obtained and add through the filter sufficient Proof Spirit to make a pint.

This is given in doses of 1 to 4 teaspoonfuls as a diuretic, etc.

3451. Tincture Calami. G. P.

Tincture of Calamus (Sweet Flag).

Calamus 1 part, diluted Alcohol 5 parts. Prepare a Tincture by maceration or percolation.

This is used as a stomachic and for flavoring other preparations.

3452. Tinctura Calendulæ.

Tincture of Calendula or Marigold.

Calendula, in No. 20 powder, 6 ounces av.

Diluted Alcohol, sufficient to make . . . 2 pints.

Moisten the powder with 12 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator, and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

The U. S. official Tincture of Calendula is intended to be made from the herb, but it is much more frequently made from the flowers, which are preferable for the purpose.

MADE BY WATER-BATH PERCOLATION.

Calendula (flowers), in No. 20 powder, 6 ounces av.

Alcohol, 22 fl.ounces.

Water, sufficient to make 2 pints.

Make in the same manner as is directed for making Tincture of Arnica Flowers.

The Calendula Flowers, when dry, can be reduced to a coarse powder by rubbing through a coarse sieve.

The proportion of Alcohol used in this formula is greater than the pharmacopœia directs, but is no more than is required to hold the medicinal properties in solution.

3453.

Tinctura Calumbæ.

Tincture of Calumba.

Calumba, No. 20 powder, . . . 10 parts or 3 ounces av.

Alcohol, } each sufficient to

Water, } make . . . 100 parts or 2 pints.

Mix Alcohol and Water (by weight) in proportion of 3 parts of Alcohol to 2 parts of Water, and, having moistened the powder with 3 ounces of the mixture, macerate for 24 hours, then pack it in a cylindrical percolator and gradually pour menstruum upon it until 2 parts of Tincture are obtained.

MADE BY WATER-BATH PERCOLATION.

Calumba, in No. 20 powder, 3 ounces av.

Alcohol, } each sufficient to make . . . 2 pints.

Water, }

Mix Alcohol and Water as above and make a Tincture by water-bath percolation as directed for making Tincture Arnica Root.

The Br. P. directs 2½ ounces of Calumba to be made into 20 fl.ounces of Tincture with Proof Spirit.

This is given as a bitter tonic and stomachic in doses of ½ to 1 teaspoonful.

3454. Tinctura Camphoræ Composita. Br.*Compound Tincture of Camphor — Paregoric.*

The Br. P. gives the following formula under the above title, the preparation corresponding nearly to the U. S. P. *Tinctura Opii Camphorata* and the G. P. *Tincture Opii Benzoica* (which see):

Opium, in powder,	40	grains.
Benzoic Acid,	40	grains.
Camphor,	30	grains.
Oil of Anise,	$\frac{1}{2}$	fl.drachm.
Proof Spirit,	20	fl.ounces.

Macerate for seven days in a closed vessel, with occasional agitation, then filter and add sufficient Proof Spirit to make 20 fl.ounces.

A fl.drachm contains $\frac{1}{4}$ grain Opium. The dose is 15 to 60 minims.

3455. Tinctura Cannabis Indicæ.*Tincture of Indian Cannabis — Tincture of Indian Hemp.*

Indian Cannabis,	$2\frac{3}{4}$	ounces av.
Alcohol, sufficient to make		a pint.

Moisten the powder with 3 fl.ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until a pint of Tincture is obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Indian Cannabis, in No. 40 powder,	$5\frac{1}{2}$	ounces av.
Alcohol, sufficient to make	2	pints.

Moisten the powder with 4 ounces of Alcohol, pack firmly in the water-bath percolator, pour upon it a pint and a half of Alcohol and set in a warm place for two days, then heat moderately and, after one hour, begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until 2 pints of the Tincture have passed.

The Br. P. directs 1 ounce av. of *Extract* of Indian Hemp to be dissolved in Rectified Spirit 20 fl.ounces.

The German formula directs 1 part of *Extract* of Indian Hemp to be dissolved in 19 parts (by weight) of Alcohol.

The dose of the U. S. Tincture is 20 to 40 minims, of the Br. and German preparations 5 to 20 minims.

3456. *Tinctura Cantharidis.*

Tincture of Cantharides.

Cantharides, 5 parts or 606 grains.

Alcohol, sufficient to make . 100 parts or 2 pints.

Moisten the powder with an ounce of Alcohol and pack it firmly in the cylindrical percolator, then gradually pour Alcohol upon it until 2 pints of Tincture are obtained.

MADE BY WATER-BATH PERCOLATION.

Cantharides, in No. 60 powder, . . . 600 grains.

Alcohol, sufficient to make 2 pints.

Make in the same manner as directed for Tincture Cannabis Indica. The dose is 3 to 15 drops.

The Br. P. formula is Cantharides, in coarse powder, $\frac{1}{4}$ ounce av., Proof Spirit 20 fl.ounces, made by maceration. Dose, 5 to 20 minims. It is only about one third the strength of the U. S. preparation.

The G. P. directs Cantharides 1 part, Alcohol 10 parts, being double the strength of the U. S.

3457. *Tinctura Capsici.*

Tincture of Capsicum.

Capsicum, 5 parts or 600 grains.

Alcohol, } each sufficient to

Water, } make 100 parts or 2 pints.

Mix Alcohol and Water in the proportion of 19 parts of Alcohol to 1 part of Water, and, having moistened the powder with $\frac{1}{2}$ fl.ounce of the mixture, pack it firmly in a cylindrical percolator, then gradually pour menstruum upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Capsicum, in No. 30 powder, 600 grains.
 Alcohol, } each sufficient to make 2 pints.
 Water, }

Mix Alcohol and Water in the proportion of 19 parts of Alcohol to 1 part of Water and moisten the drug with an ounce of the mixture, pack it firmly in the water-bath percolator, pour upon it a pint and a half of the menstruum and set in a warm place for two days, then heat very moderately and, after one hour, begin to percolate, adding the menstruum to the drug and continuing the heat and percolation until 2 pints of the Tincture have passed.

The Br. P. formula directs $\frac{3}{4}$ ounce of Capsicum with sufficient Rectified Spirit to make 20 fl.ounces.

The G. P. directs 1 part of Capsicum with 10 parts of Alcohol, to be made by maceration. It is double the strength of the U. S. or Br. preparation.

Tincture of Capsicum is much used externally in liniments, and is given as a warm stimulant in doses of 5 to 30 minims.

3458. Tinctura Cardamomi.*Tincture of Cardamom.*

Cardamom, 15 parts or $4\frac{5}{8}$ ounces av.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Moisten the powder with 4 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of the Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Cardamom, in No. 30 powder, $4\frac{5}{8}$ ounces av.
 Diluted Alcohol, sufficient to make . . 2 pints.

Make in the same manner as directed for Tincture Arnica Root (3440).

This is given as an aromatic stimulant in doses of $\frac{1}{2}$ to 1 teaspoonful.

3459. Tinctura Cardamomi Composita.*Compound Tincture of Cardamom.*

Cardamom,	20 parts or 280	grains.
Cinnamon,	20 parts or 280	grains.
Caraway,	10 parts or 140	grains.
Cochineal,	5 parts or 70	grains.
Glycerin,	60 parts or 1½	fl.ounce.
Diluted Alcohol, sufficient		
to make	1000 parts or 2	pints.

Mix the drugs and reduce them to a moderately coarse powder, moisten them with an ounce of diluted Alcohol, pack them firmly in a cylindrical percolator and gradually pour diluted Alcohol upon them until 30½ fl.ounces have passed; to this add the Glycerin and mix them thoroughly. Filter if necessary. U. S. 1880.

This may be made by water-bath percolation in the same manner as Tincture of Arnica Root (3440).

The Br. P. formula directs Cardamom Seeds ¼ ounce, Caraway Fruit (seeds) ¼ ounce, Raisins, freed from seeds, 2 ounces, Cinnamon Bark ½ ounce, Cochineal 55 grains, Proof Spirit 20 fl.ounces, to make a Tincture.

This is a pleasant aromatic, used chiefly for flavoring other preparations. Dose, a teaspoonful. It is quite a favorite addition to bitters or other stomachics, in which it is used chiefly as a flavoring.

3460. Tinctura Cascarillæ. Br.*Tincture Cascarilla.*

Cascarilla Bark, in No. 40 powder,	2½	ounces av.
Proof Spirit,	20	fl.ounces.

Make a Tincture by macerating 48 hours in 15 fl.ounces of the Spirit, then percolating with the addition of enough Spirit through the percolator to make 20 fl.ounces.

This is a tonic and is given in doses of ½ to 2 fl.drachms.

3461. Tinctura Castorei. G. P.*Tincture of Castor.*

Castor, 1 part.
 Alcohol, 10 parts.

Make by maceration.

The formula for this Tincture was official in the U. S. 1870 Pharmacopœia, Castor, bruised, 2 troyounces, Alcohol 2 pints. Made by maceration. It is given as an antispasmodic. Dose, 20 to 60 minims.

3462. Tinctura Catechu Composita.

Compound Tincture of Catechu — 1880. Tincture of Catechu — U. S. 1870.

Catechu, in No. 40 powder, 12 parts or $3\frac{3}{4}$ ounces av.
 Cinnamon, in No. 40 powder, 8 parts or $2\frac{1}{2}$ ounces av.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Mix the powders, and, having moistened the mixture with 5 fl.ounces of diluted Alcohol, macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

The U. S. 1870 formula was Catechu 3 tr.ounces, Cinnamon 2 tr.ounces, Diluted Alcohol sufficient to make 2 pints. It was called, simply, Tincture of Catechu.

The Br. formula is Catechu $2\frac{1}{2}$ ounces av., Cinnamon Bark 1 ounce, Proof Spirit 20 fl.ounces. Making a preparation nearly the same as the U. S.

The German *Tincture Catechu* is prepared from Catechu 1 part, diluted Alcohol 5 parts, by maceration.

This may be made by water-bath percolation as directed for Tincture Aloes (3435).

This Tincture is given as an aromatic astringent in doses of $\frac{1}{2}$ to 2 teaspoonfuls. It is a favorite addition to diarrhoea mixtures, astringent washes for spongy gums, and other similar preparations.

3463. Tinctura Chinoidini. G. P.*Tincture of Chinoidin.*

Chinoidin,	10 parts.
Diluted Alcohol,	85 parts.
Hydrochloric Acid,	5 parts.

Dissolve the Chinoidin in the liquids and filter. Dose $\frac{1}{2}$ to a teaspoonful or more:

This is a tonic and antiperiodic used particularly for chills, fever and ague, and malaria. Its extreme bitterness can be overcome in a measure by adding 30 grains of Extract of Liquorice, in powder, to each fl.ounce.

3464. Tinctura Chiratæ.*Tincture of Chirata.*

Chirata, in No. 40 powder,	3 ounces av.
Diluted Alcohol, sufficient to make	2 pints.

Moisten the powder with 3 fl.ounces of Diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

This may be made by water-bath percolation in the same manner as is directed for making Tincture Arnica Root (3440).

The Br. P. formula is Chirata $2\frac{1}{2}$ ounces, Proof Spirit to make 20 fl.ounces.

It is a bitter stomachic, similar to Tincture of Gentian. The dose is $\frac{1}{2}$ to 1 teaspoonful.

3465. Tinctura Chloroformi Composita. Br.*Tincture of Chloroform.*

Chloroform,	1 fl.ounce.
Rectified Spirit,	4 fl.ounces.
Compound Tincture of Cardamom,	5 fl.ounces.

Mix them.

Although this preparation is not official in the U. S., it is frequently prescribed and used in this country. It is nearly double the strength of the U. S. official Spirit of Chloroform.

3466. Tinctura Chloroformi et Morphinae. Br.*Tincture of Chloroform and Morphine* — “*Chlorodyne*.”

Contains in 10-minim dose.

Chloroform,	1	fl.ounce.	1 $\frac{1}{4}$ minim.
Ether,	2	fl.drachms.	$\frac{1}{3}$ minim.
Rectified Spirit, . . .	1	fl.ounce.	1 $\frac{1}{4}$ minim.
Hydrochlorate of Morphine,	8	grains.	$\frac{1}{8}$ grain.
Diluted Hydrocyanic Acid,	$\frac{1}{2}$	fl.ounce.	$\frac{5}{8}$ minim.
Oil of Peppermint, . .	4	minims.	$\frac{1}{80}$ minim.
Liquid Extract of Liquorice,	1	fl.ounce.	1 $\frac{1}{4}$ minim.
Treacle,	1	fl.ounce.	
Syrup, a sufficiency to make	8	fl.ounces.	

Dissolve the Hydrochlorate of Morphine and Oil of Peppermint in the Spirit and add the Chloroform and Ether. Mix the Liquid Extract of Liquorice and Treacle with 3 fl.ounces of Syrup and add to the previously formed solution, mix them thoroughly, add the Hydrocyanic Acid and make up the volume of the liquid with Syrup to 8 fl.ounces.

This is a new Br. P. official intended to supply a popular demand for “Chlorodyne,” which was formerly a proprietary medicine. Other formulas for Chlorodyne will be found elsewhere. It is given in 5 to 10 minims doses as an anodyne.

3467. Tinctura Cimicifugæ.*Tincture of Cimicifuga (Black Cohosh)* — *Tincture of Actæa*.

Black Cohosh, in No. 60 powder, . .	5 $\frac{1}{2}$ ounces av.
Alcohol, sufficient to make	2 pints.

Moisten the powder with 4 ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Black Cohosh, in No. 50 powder, . . . 5½ ounces av.
 Alcohol, sufficient to make 2 pints.

Moisten the powder with 3 ounces of Alcohol and pack firmly in the water-bath percolator, pour upon it a pint and a half of Alcohol and set in a warm place for two days, then heat moderately, and, after one hour, begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until 2 pints of the Tincture have passed.

The Br. P. directs *Cimicifuga* 2½ ounces to be made with Proof Spirit into 20 fl.ounces of Tincture by maceration and percolation.

This is given as a tonic and anti-rheumatic in doses of 15 to 60 minims.

3468. **Tinctura Cinchonæ.**

Tincture of Cinchona — Tinctura Chinæ. G. P.

Yellow Cinchona, in No. 60 powder, . . . 6 ounces av.
 Glycerin, 2 fl.ounces.
 Alcohol, { each sufficient to make . . . 2 pints.
 Water, {

Mix the Glycerin with 23 fl.ounces of Alcohol and 7 fl.ounces of Water, and, having moistened the powder with 6 ounces of the mixture, macerate for 24 hours, then pack it firmly in a cylindrical glass percolator and gradually pour on the remainder of the mixture. When the liquid has disappeared from the surface gradually pour on more of the mixture of Alcohol and Water, using the same proportions as before, and continue the percolation until 2 pints of the Tincture are obtained. U. S. 1880. The U. S. 1870 preparation contained no Glycerin.

MADE BY WATER-BATH PERCOLATION.

Yellow Cinchona, in No. 50 powder, . . . 6 ounces av.
 Glycerin, 2 fl.ounces.
 Alcohol, { each sufficient to make . . . 2 pints.
 Water, {

Mix the Glycerin with 20 fl.ounces of Alcohol and 8 fl.ounces of Water, moisten the powder with 6 ounces of the mixture

and macerate in a closed vessel for 24 hours; transfer it then to the water-bath percolator, pack firmly, pour upon it the remainder of the mixture and set in a warm place for 24 hours, then heat very moderately, and, after one hour, begin to percolate. When the liquid has disappeared from the surface add through the percolator enough Alcohol and Water, mixed in the proportion of 2 measures of Alcohol to 1 measure of Water, to complete the percolation and make 2 pints of Tincture. Lastly, after standing a few days, filter through paper.

The Br. P. directs *Red Cinchona* Bark 4 ounces, Proof Spirit to make 20 fl.ounces, in the same manner as the U. S.

The G. P. directs 1 part of *Cinchona* and 5 parts of diluted Alcohol, to be made by maceration.

This is given as a tonic in doses of $\frac{1}{2}$ to 2 fl.drachms.

3469. *Tinctura Cinchonæ Composita.*

*Compound Tincture of Cinchona — Huxham's Tincture —
Tinctura Chinæ Composita. G. P.*

Red Cinchona, . . .	10 parts or	3 ounces av.
Bitter Orange Peel, . .	8 parts or	2½ ounces av.
Serpentaria;	2 parts or	260 grains.
Glycerin,	10 parts or	2¼ fl.ounces.
Alcohol, }	each sufficient	
Water, }	to make . 100 parts or	
		2 pints.

Mix the Glycerin with 80 parts or 28 fl.ounces of Alcohol and 10 parts or 3 fl.ounces of Water. Having mixed the *Cinchona*, Orange Peel, and *Serpentaria*, reduce them to a fine (No. 60) powder, moisten the powder with 20 parts or 5 fl.ounces of the menstruum and macerate for 24 hours, then pack it firmly in a cylindrical glass percolator and gradually pour on the remainder of the menstruum. When the liquid has disappeared from the surface gradually pour upon it enough of a mixture of Alcohol and Water, using the same proportions as before, and continue the percolation until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

The U. S. 1870 formula was about the same, except that no Glycerin was used; this is added to prevent the precipitation

of cincho-tannic acid and other constituents, which occurs when it is not employed.

MADE BY WATER-BATH PERCOLATION.

This may be made by water-bath percolation, with the ingredients as above, in the same manner as is directed for making Tincture Cinchona, preceding.

The Br. P. formula is Red Cinchona Bark 2 ounces, Bitter Orange Peel 1 ounce, Serpentry $\frac{1}{2}$ ounce, Saffron 55 grains, Cochineal 28 grains, Proof Spirit to make 20 fl.ounces, by maceration and percolation.

The G. P. directs, under the title *Tinctura Chinæ Composita*, Cinchona 6 parts, Orange Peel 2 parts, Gentian 2 parts, Cinnamon 1 part, diluted Alcohol 50 parts. This is also called *Elixir Roborans*.

This Tincture is much used as a tonic and stomachic, the dose being $\frac{1}{2}$ to 2 fl.drachms.

3470. Tinctura Cinnamomi.

Tincture of Cinnamon.

Cinnamon, in No. 40 powder, 10 parts or $2\frac{7}{8}$ ounces av.

Alcohol, } each sufficient to

Water, { make . . . 100 parts or 2 pints.

Mix Alcohol and Water in the proportion of 3 parts by weight (22 fl.ounces) of Alcohol to 2 parts (12 fl.ounces) of Water, and, having moistened the powder with 3 fl.ounces of the mixture, pack it in a conical percolator and gradually pour menstruum upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Make a Tincture of the ingredients named above by water-bath percolation.

The Br. P. directs Cinnamon Bark $2\frac{1}{2}$ ounces av., Rectified Spirit to make 20 fl.ounces of Tincture.

The G. P. directs 1 part of Cinnamon and 5 parts of diluted Alcohol.

Tincture of Cinnamon is used as an aromatic and stimulant in doses of $\frac{1}{2}$ to 1 teaspoonful.

3471. Tinctura Cocci. Br.*Tincture of Cochineal.*

Cochineal, in powder, 2½ ounces av.

Proof Spirit, 20 fl.ounces.

Macerate for seven days in a closed vessel, with occasional agitation, strain, press, and add sufficient Proof Spirit to make 20 fl.ounces.

3472. Tinctura Colchici.*Tincture of Colchicum.*

Colchicum Seed, in No. 30

powder, 15 parts or 4⅝ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 4 ounces of diluted Alcohol and macerate for 24 hours, then pack it in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Colchicum Seed, in No. 30 powder, . . 4⅝ ounces av.

Diluted Alcohol, sufficient to make . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for Tincture Arnica Root (3440).

The Br. P., under the title *Tinctura Colchici Seminum* (*Seminis?*), directs Colchicum Seed 2½ ounces av. with Proof Spirit to make 20 fl.ounces of Tincture.

The G. P. directs 1 part of Colchicum Seed with 10 parts of diluted Alcohol.

This is used as an anti-rheumatic, the dose being 10 to 40 minims.

3473. Tinctura Colocynthis. G. P.*Tincture of Colocynth.*

Colocynth, with the Seeds, 1 part.

Alcohol, 10 parts.

Prepared by maceration. This is a bitter stomachic and cathartic, the dose being 5 to 15 minims.

3474.

Tinctura Conii.*Tincture of Conium — Tincture of Hemlock.*

The 1870 Pharmacopœia directed Conium Leaves to be used in this preparation, but in the present revision Conium Leaves have been dismissed, the fruit only being officinal.

Conium (fruit), in No. 30 powder, . . . 4¾ ounces av.
 Diluted Hydrochloric Acid, . . . 1 fl.drachm.
 Diluted Alcohol, sufficient to make . . . 2 pints.

Moisten the powder with 2 fl.ounces of diluted Alcohol, previously mixed with the diluted Hydrochloric Acid, and macerate for 24 hours, then pack it moderately in a conical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Conium (fruit), in No. 30 powder, . . . 4¾ ounces av.
 Diluted Hydrochloric Acid, . . . 1 fl.drachm.
 Diluted Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as directed for making Tincture Arnica Root (3440).

The Br. P. formula is Hemlock Fruit 2½ ounces, Proof Spirit to make 20 fl.ounces.

This is a sedative, the dose being 20 to 60 minims.

3475.

Tinctura Croci.*Tincture of Saffron.*

Saffron, 10 parts or 3 ounces av.
 Diluted Alcohol, enough to make 100 parts or 2 pints.

Moisten the Saffron with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

This is designed to be made from the foreign Saffron (*Crocus Sativus*). Many American druggists do not keep this on account of its high price, but use in its place American Saffron or Safflower (*Carthamus Tinctorius*), which much resembles it.

It may be made by water-bath percolation as directed for making Tincture Arnica Flowers.

The Br. P. directs Saffron 1 ounce with Proof Spirit to make 20 fl.ounces.

The G. P. formula directs Saffron 1 part, diluted Alcohol 10 parts.

Tincture of Saffron is an aromatic, used to add to other preparations and for its orange colors; also given in doses of $\frac{1}{2}$ to 1 teaspoonful.

3476. *Tinctura Cubebæ.*

Tincture of Cubeb.

Cubeb, in No. 30 powder, 10 parts or $3\frac{1}{8}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Cubeb, in No. 30 powder, $3\frac{1}{8}$ ounces av.

Diluted Alcohol, sufficient to make . 2 pints.

Make a Tincture by water-bath percolation in the same manner as directed for making Tincture Arnica Root (3440).

The Br. P. directs $2\frac{1}{2}$ ounces of Cubebs, in powder, with Rectified Spirit to make 20 fl.ounces of Tincture.

As the medicinal properties of Cubebs are better soluble in a stronger alcoholic menstruum, this is the better formula.

This is given as a stimulant to the mucous membrane in doses of $\frac{1}{2}$ to 2 fl.drachms.

3477. *Tinctura Digitalis.*

Tincture of Digitalis (Fox Glove).

Digitalis, recently dried,

and in No. 60 powder, . 15 parts or $4\frac{5}{8}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 5 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Digitalis, recently dried, in No. 50 powder, $4\frac{5}{8}$ ounces av.

Diluted Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for making Tincture of Belladonna (3446).

The Br. P. directs $2\frac{1}{2}$ ounces av. of Foxglove Leaves with Proof Spirit to make 20 fl.ounces of Tincture.

The G. P. directs 1 part of Digitalis and 10 parts of diluted Alcohol.

This is given as an arterial sedative, the dose of the U. S. Tincture being 5 to 30 minims.

3478. Tinctura Ergotæ. Br.

Tincture of Ergot.

Ergot, finely comminuted, 5 ounces av.

Proof Spirit, 20 fl.ounces.

Macerate the Ergot for 48 hours in 15 fl.ounces of the Spirit in a closed vessel, agitating occasionally, then transfer to a percolator, and, when the fluid ceases to pass, continue the percolation with Proof Spirit until 20 fl.ounces are obtained.

The dose is 5 to 30 minims.

3479. Tinctura Ferri Acetatis.

Tincture of Acetate of Iron (Ferric Acetate).

	By weight.	By measure.
Solution of Acetate of Iron, 50 parts.		$6\frac{7}{8}$ fl.ounces.
Alcohol, 30 parts.		$5\frac{5}{8}$ fl.ounces.
Acetic Ether, 20 parts.		$3\frac{1}{2}$ fl.ounces.

Mix the Alcohol and Acetic Ether and gradually add the Solution of Acetate of Iron, taking care that the mixture remains cool.

Keep the Tincture in glass stoppered bottles in a cool, dark place. U. S. 1880.

RADEMACHER'S TINCTURE OF ACETATE OF IRON.

This is much better known than the officinal Tincture. The formula is therefore given:

Sulphate of Iron, pure,	23 parts.
Acetate of Lead,	24 parts.
Distilled Water,	48 parts.
Good Vinegar,	96 parts.
Alcohol,	80 parts.

Triturate the Sulphate of Iron and Acetate of Lead together in a Wedgewood mortar until a thick magma results, then add gradually the Water and Vinegar, and pour the whole into a flask or bottle, which is to be kept at a temperature of 30° to 40° C. (86° to 104° F.) for three days, with occasional agitation; filter and let the filtrate stand for 30 days, occasionally shaking, in a wide-mouth bottle, only half filled, and loosely covered with a plate of glass; then add 80 parts of Alcohol and allow to stand ten days more in the same flask, and, finally, filter.

The Br. P. formula is strong Solution Acetate of Iron 5 fl.ounces, Acetic Acid 1 fl.ounce, Rectified Spirit 5 fl.ounces, distilled Water 9 fl.ounces. Mix and add sufficient distilled Water to make the measure 20 fl.ounces. The dose is 5 to 30 minims.

The G. P., under the title *Tinctura Ferri Acetici Ætherea* or *Etherial Tincture of Acetate of Iron*, is Solution Acetate of Iron 80 parts, Alcohol 12 parts, Acetic Ether 8 parts.

3480. **Tinctura Ferri Chloridi.**

Tincture of Chloride of Iron — Tincture Muriate of Iron.

By weight.

Solution of Chloride of Iron,	35 parts.
Alcohol,	65 parts.

Mix the Solution with the Alcohol and let it stand in a closely-covered vessel at least three months, then transfer it to glass-stoppered bottles. U. S. 1880.

In making this Tincture by the formula of the 1880 Pharmacopœia, if the articles used are of the standard strength,

the proportion will be about 8 fl.ounces of the Solution to 25 fl.ounces of Alcohol, but as the Solution of Chloride of Iron as bought is not always of the same specific gravity as the Pharmacopœia directs, it is best to combine the ingredients by weight.

The Br. P., under the title *Tinctura Ferri Perchloridi*, or *Tincture Perchloride of Iron*, directs strong Solution of Perchloride of Iron 5 fl.ounces, Rectified Spirit 5 fl.ounces, distilled Water 10 fl.ounces, to be mixed and enough distilled Water to be added to make 20 fl.ounces.

Tincture of Iron is one of the best known preparations of Iron, acting as a tonic and astringent. The dose is from 10 to 30 minims, which should be diluted and taken through a tube to prevent blackening the teeth.

A so-called *Tasteless Tincture of Iron* is considerably used. See page 570.

3481. *Tinctura Ferri Chlorati Ætherea*. G. P.

Ethereal Tincture Chloride of Iron — Spiritus Ferri Chlorati Æthereus — Liquor Anodynus Martiatius — Tinctura Tonico-Nervina Bestuscheffi.

Solution Chloride of Iron,	. . . . .	1 part.
Ether,	. . . . .	2 parts.
Alcohol,	. . . . .	7 parts.

Mix them and expose in clear glass bottles to sunlight until colorless, then remove to a shady place and open them occasionally until the contents have again assumed a yellow color. This Tincture contains 1 per cent. of Iron.

3482. *Tinctura Ferri Pomatia*. G. P.

Tincture of Ferrated Extract of Apples — Stahltropfen.

Ferrated Extract of Apples,	. . . . .	1 part.
Cinnamon Water,	. . . . .	9 parts.

Dissolve and filter.

This Tincture (which is more properly a solution) is much prescribed and used as a tonic in German practice.

3483. Tinctura Gallæ.*Tincture of Nutgall.*

Nutgall, No. 40 powder, . . . 20 parts or $6\frac{1}{3}$ ounces av.

Glycerin, 10 parts or $2\frac{1}{4}$ fl.ounces.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Mix the Glycerin with 30 fl.ounces of diluted Alcohol, and, having moistened the powder with 4 ounces of the mixture, pack it in a conical glass percolator, then gradually pour upon it, first, the remainder of the mixture, and, afterward, diluted Alcohol, until 2 pints of Tincture are obtained. U. S. 1880.

The Br. P. directs Galls $2\frac{1}{2}$ ounces with Proof Spirit to make 20 fl.ounces of the Tincture.

The G. P., under the title *Tinctura Gallarum*, directs 1 part of Nutgalls with 5 parts of diluted Alcohol.

This Tincture is given as an astringent in doses of $\frac{1}{2}$ to 2 fl.drachms.

3484. Tinctura Gelsemii.*Tincture of Gelsemium (Yellow Jasmin).*

Gelsemium (root), in No.

60 powder, 15 parts or $4\frac{1}{8}$ ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 10 parts or 3 fl.ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Gelsemium, in No. 60 powder, 4 ounces av.

Alcohol, sufficient to make 2 pints.

Moisten the powder with 3 ounces of Alcohol and pack firmly in the water-bath percolator, pour upon it a pint and a half of Alcohol and set in a warm place for two days, then heat very moderately, and, after one hour, begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until 2 pints of Tincture have passed.

A saturated Tincture is also prepared from the green root, which is highly esteemed.

The Br. P. directs $2\frac{1}{2}$ ounces of Gelsemium with Alcohol to make 20 fl.ounces of Tincture.

Tincture of Gelsemium is employed as an arterial sedative, the dose being 10 to 30 minims of the official Tincture, but much less of the green Tincture.

3485. Tinctura Gentianæ. G. P.

Tincture of Gentian.

Gentian, 1 part.

Diluted Alcohol, 5 parts

Prepare a Tincture by maceration.

The dose is a teaspoonful or more.

3486. Tinctura Gentianæ Composita.

Compound Tincture of Gentian.

Gentian, 8 parts or $2\frac{1}{2}$ ounces av.

Bitter Orange Peel, . . . 4 parts or $1\frac{1}{4}$ ounces av.

Cardamom, 2 parts or 280 grains.

Diluted Alcohol, suffi-

cient to make . . . 100 parts or 2 pints.

Mix the Gentian, Orange Peel, and Cardamom, and reduce them to a moderately coarse powder, moisten the powder with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

This may be made with the same ingredients by water-bath percolation as directed for making Tincture Arnica Root.

The Br. P. formula is Gentian $1\frac{1}{2}$ ounce av., Bitter Orange Peel $\frac{3}{4}$ ounce av., Cardamom Seed $\frac{1}{4}$ ounce av., with Proof Spirit to make 20 fl.ounces of Tincture.

Tincture of Gentian Compound is a bitter tonic, a popular remedy for dyspepsia and similar disorders. The dose is $\frac{1}{2}$ to 2 teaspoonfuls.

3487. Compound Tincture of Gentian, Improved.

Gentian, in coarse powder,	2½ ounces av.
Cardamom, a fine powder,	½ ounce av.
Oranges, medium size, sweet,	No. 3.
Alcohol,	1 pint.
Water, sufficient to make	2 pints.

Peel the Oranges, squeeze out the juice and mix it with 12 fl.ounces each of Alcohol and Water, chop the Orange Peel fine, mix it with the Gentian and Cardamom, and, having moistened the drugs with 3 ounces of the mixture, macerate for 24 hours in a closed vessel. Transfer it then to a percolator, pack moderately, pour upon it the remainder of the mixture and set in a warm place for two days, then begin to percolate, adding to the drugs, after the liquid has disappeared from the surface, the remaining 4 ounces of Alcohol mixed with 4 ounces of Water, and continuing the percolation with Water, if necessary, until 2 pints of Tincture are obtained. Lastly, after standing a few days for the albuminous matter to separate, filter.

This makes an excellent Compound Tincture of Gentian, of much better flavor than the official preparation.

3488. Tinctura Guaiaci.

Tincture of Guaiac.

Guaiac (resin), in coarse powder,	20 parts or 5½ ounces av.
Alcohol, sufficient to make 100 parts or 2	pints.

Mix the powder with a pint and a half of Alcohol and macerate for seven days in a closed vessel; then filter through paper, adding through the filter enough Alcohol to make 2 pints of Tincture. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Guaiac, in coarse powder,	5½ ounces av.
Alcohol, sufficient to make	2 pints.

Mix the Guaiac with an equal bulk of coarse sand and agitate the mixture with a pint and a half of Alcohol in a wide-

mouth bottle, cover the perforated diaphragm of the water-bath percolator with burlap or coarse cloth and pour the mixture upon it; keep in a warm place for three days, then heat moderately, and, after one hour, begin to percolate, adding Alcohol to the drug when the liquid has disappeared from the surface, and continuing the heat and percolation until 2 pints of the Tincture are obtained.

This Tincture is given as an anti-rheumatic and laxative in doses of $\frac{1}{2}$ to 1 teaspoonful diluted.

3489. **Tinctura Guaiaci Ammoniata.**

Ammoniated Tincture of Guaiac.

Guaiac (resin), in coarse
powder, 20 parts or 5½ ounces av.
Aromatic Spirit of Am-
monia, sufficient to make 100 parts or sufficient.

The 1870 Pharmacopœia directs the Guaiac to be macerated with the Aromatic Spirit of Ammonia for seven days and filtered.

The 1880 Pharmacopœia directs to mix the powder with a pint and a half of Aromatic Spirit of Ammonia and macerate for seven days in a closed vessel, then filter through paper, adding through the filter Aromatic Spirit of Ammonia until 2 pints of Tincture are obtained.

The filter should be well covered during filtration to prevent evaporation of Ammonia.

The Br. P. directs Guaiacum Resin, in powder, 4 ounces av., to be macerated with 15 fl.ounces of Aromatic Spirit of Ammonia for seven days with occasional agitation, then filtered and enough Alcohol added through the filter to make 20 fl.ounces.

The dose is $\frac{1}{2}$ to 1 fl.drachm diluted.

Tincture of Guaiac, Alkaline.—An Alkaline Tincture of Guaiac, not official, but known as *Devees' Tincture of Guaiac*, is made with Guaiac Resin, in powder, 2 tr.ounces, Carbonate of Potassium 45 grains, Pimenta, in powder, 240 grains, Diluted Alcohol sufficient to make 16 fl.ounces. Digest two weeks. The dose is 1 to 2 teaspoonfuls.

3490. Tincturæ Herbarum Recentium.*Tinctures of Fresh Herbs.*

Under this heading the 1880 revision gives a general formula for making Tinctures from Fresh Herbs.

The Fresh Herb, bruised

or crushed, 50 parts or 16 ounces av.

Alcohol (by weight), . . 100 parts or $37\frac{2}{3}$ fl.ounces.

Macerate the Herb with the Alcohol for 14 days, then express the liquid and filter.

MADE BY WATER-BATH PERCOLATION.

Tinctures of fresh herbs, flowers, barks, leaves, roots, etc., may be made by water-bath percolation by the following

General Formula for Tinctures from Fresh Herbs, etc.

The Fresh Herb, Bark, Flower, Leaf,

or Root, 16 ounces av.

Alcohol, sufficient to make 2 pints.

Bruise, crush, cut, grate, or otherwise reduce the substance to the proper condition for exhaustion and pack it in the water-bath percolator, pour upon it a pint of Alcohol and set in a warm place for two days, then heat moderately, and, after one hour, begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until a pint and a half has passed; remove the drug from the percolator, express, and, if the expressed liquid measures more than half a pint, evaporate it to that measure and add to the percolate; but if it measures less than half a pint, make up to that measure with Alcohol and add to the percolate. Lastly, after standing for a few days, filter through paper.

The so-called "Green Tinctures," "Saturated Tinctures," "Specific Tinctures," etc., may be made in this manner. A great variety of Tinctures are prepared from green plants in this manner.

3491. Tinctura Humuli.*Tincture of Hops — Tincture Lupuli. Br.*Hops, No. 20 powder, . . . 20 parts or $6\frac{1}{4}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 12 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Hops, in No. 20 powder, $6\frac{1}{4}$ ounces av.

Diluted Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as directed for Tincture Belladonna.

The Br. P., under the title *Tinctura Lupuli*, directs Hops $2\frac{1}{2}$ ounces av. with Proof Spirit to make 20 fl.ounces of Tincture.

The dose of Tincture of Hops is $\frac{1}{2}$ to 2 fl.drachms as a tonic and nervine.

3492. Tinctura Hydrastis.*Tincture of Hydrastis (Golden Seal).*

Hydrastis, in No. 60

powder, 20 parts, or $6\frac{1}{4}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 5 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

This may be made by water-bath percolation as directed for Tincture Arnica Root (3440).

The dose is a teaspoonful or more.

3493. Tinctura Hyoscyami.*Tincture Hyoscyamus (Henbane).*

Hyoscyamus Leaves, recently dried, in No. 60 powder, 15 parts or $4\frac{3}{4}$ ounces av.
 Diluted Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 4 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Hyoscyamus Leaves, in No. 50 powder, $4\frac{3}{4}$ ounces av.
 Diluted Alcohol, sufficient to make . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for Tincture Belladonna (3446).

The Br. P. directs Hyoscyamus $2\frac{1}{2}$ ounces av. with Proof Spirit to make 20 fl.ounces of Tincture.

This is given as an anodyne and sedative. Dose, $\frac{1}{2}$ to 1 fl.drachm.

3494. Tinctura Ignatiæ.*Tincture of Ignatia.*

Ignatia, in No. 60 powder, 10 parts.
 Alcohol, } each sufficient.
 Water, }

This new official formula directs the powder to be exhausted with Alcohol and Water, mixed in the proportion of 8 parts of the former to 1 of the latter. A portion of the Tincture thus obtained is then assayed to ascertain the quantity of dry Extract of Ignatia which it contains, and from this the quantity of extract which the whole percolate represents is to be estimated. Menstruum is then to be added, if required, so that 1 part of the dried extract may be contained in 100 parts of the Tincture. For the detailed formula see Tincture of Nux Vomica, which is made in the same manner.

A more simple method of making it is as follows :

Extract Ignatia, Alcoholic, dry, . . .	60 grains.
Alcohol,	14 fl.ounces.
Water,	1½ fl.ounces.

Mix the Alcohol and Water and dissolve the Extract in the mixture.

This is the same strength as the officinal formula.

3495. **Tinctura Iodi.**

Tincture of Iodine.

Iodine,	8 parts or 495 grains.
Alcohol,	92 parts or 1 pint.

Dissolve the Iodine in the Alcohol. U. S. 1880.

This is quite different from the Br. P. formula, which is Iodine ½ ounce av., Iodide of Potassium ½ ounce av., dissolved in Rectified Spirit 20 fl.ounces. The dose is 5 to 20 minims. It corresponds nearly with the U. S. 1870 Tincture of Iodine Compound.

The G. P. formula, under the title *Tinctura Jodi*, is Iodine 1 part, Alcohol 10 parts.

The U. S. and G. P. Tinctures are seldom given internally but are used for outward application as an absorbent, alone or combined with other substances. When given, the dose is 1 to 3 minims.

3496. **Tinctura Iodinii Composita.**

Compound Tincture of Iodine.

This was official in the U. S. 1870 Pharmacopœia, and is still called for.

Iodine,	240 grains.
Iodide of Potassium,	480 grains.
Alcohol,	a pint.

Dissolve the Iodine and Iodide of Potassium in the Alcohol.

This Tincture is omitted in the present Pharmacopœia. Its only advantage was that it could be combined with Water without precipitation.

3497. Tincture Ipecacuanhæ. G. P.*Tincture of Ipecac.*

Ipecac, 1 part.

Diluted Alcohol, 10 parts.

Make a Tincture by maceration or percolation. The dose is 15 to 30 minims.

3498. Tinctura Ipecacuanhæ et Opii.*Tincture Ipecac and Opium—Tinctura Doveri.*

Deodorized Tincture of Opium, . . 15 fl.ounces.

Fluid Extract of Ipecac, 1½ fl.ounces.

Diluted Alcohol, sufficient.

Evaporate the deodorized Tincture of Opium to 12¾ fl.ounces. When it has become cold, add to it the Fluid Extract of Ipecac, filter the mixture and pass through the filter enough diluted Alcohol to make 15 fl.ounces. U. S. 1880.

This Tincture represents Dover's powder in a liquid form, 10 minims containing the strength of 1 grain each of Opium and Ipecac. The dose is 10 to 15 minims.

3499. Tinctura Jaborandi. Br.*Tincture of Jaborandi—Tincture of Pilocarpus.*

Jaborandi, in No. 40 powder, 5 ounces av.

Proof Spirit, 20 fl.ounces.

Macerate the Jaborandi for 48 hours in 15 fl.ounces of the Spirit in a closed vessel, agitating occasionally, then transfer to a percolator and, when the fluid ceases to pass, continue the percolation with the remaining 5 ounces of Spirit. Afterwards subject the contents of the percolator to pressure, filter the product, mix the liquids, and add sufficient Proof Spirit to make 20 fl.ounces.

This may also be made by water-bath percolation as directed for Tincture of Belladonna. Dose, ½ to 1 fl.drachm.

3500. Tinctura Jalapæ. Br.*Tincture of Jalap.*

Jalap, in powder, 2½ ounces av.
 Proof Spirit, 20 fl.ounces.

Make a Tincture by maceration, percolation, etc., as directed for the preceding.

This Tincture was official in the 1870 U. S. P., the formula being Jalap 6 tr.ounces, Alcohol 2 parts to Water 1 part, a sufficient quantity to make 2 pints.

The dose, as a purgative, is ½ to 2 fl.drachms.

3501. Tinctura Kino.*Tincture of Kino.*

Kino, 10 parts or 360 grains.
 Glycerin, 15 parts or 1 fl.ounce.
 Alcohol, } each sufficient
 Water, } to make . . 100 parts or ½ pint.

Mix the Glycerin with 60 parts or 6 fl.ounces of Alcohol, and 15 parts or 1¼ fl.ounces of Water, rub the Kino in a mortar, adding gradually 30 parts or 3 fl.ounces of menstruum until a smooth paste is made; transfer this to a bottle, add the remainder of the menstruum and macerate for 24 hours, occasionally shaking the bottle, then filter through paper, adding through the filter enough of a mixture of Alcohol and Water, made in the proportion of 5 measures of Alcohol to 1 measure of Water, to make half a pint of the Tincture. U. S. 1880.

Keep the Tincture in well-stopped bottles.

The great trouble with Tincture of Kino is its tendency to gelatinize. This formula, if properly followed, is supposed to overcome this difficulty.

The Br. P. formula is Kino 2 ounces, Glycerin 3 fl.ounces, Distilled Water 5 fl.ounces, Rectified Spirit 12 fl.ounces. Macerate for 7 days in a closed vessel, with occasional agitation, filter, and add sufficient Rectified Spirit to make 20 fl.ounces.

Tincture of Kino is an astringent, given in doses of ½ to 2 fl.drachms.

3502. Tinctura Krameriaë.*Tincture of Krameria (Rhatany).*

Rhatany (Root), in No. 40
 powder, 20 parts or $6\frac{1}{4}$ ounces av.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Moisten the powder with 6 ounces of diluted Alcohol and macerate for 24 hours, then pack it in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Rhatany, in No. 40 powder, . . . $6\frac{1}{4}$ ounces av.
 Diluted Alcohol, sufficient to make . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for Tincture Arnica Root (3440).

The Br. P. directs Rhatany Root $2\frac{1}{2}$ ounces av. with Proof Spirit to make 20 fl.ounces.

The G. P., under the title *Tinctura Ratanhiæ*, directs Krameria 1 part, diluted Alcohol 5 parts, to be made by maceration.

Tincture of Rhatany is an astringent, given in doses of $\frac{1}{2}$ to 2 fl.ounces.

3503. Tinctura Laricis. Br.*Tincture of Larch.*

Larch Bark, in No. 40 powder, . . . $2\frac{1}{2}$ ounces av.
 Rectified Spirit, 20 fl.ounces.

Macerate the Larch Bark for 48 hours in 15 fl.ounces of the Spirit, then percolate, adding Rectified Spirit through the percolator to make 20 fl.ounces of the Tincture.

This is the Tincture of the European Larch, *Abies Larix*. The dose is 20 to 30 minims.

3504. Tinctura Lavandulæ Composita.

Compound Tincture of Lavender, U. S. 1880 — Spiritus Lavendulæ Composita, U. S. 1870 — Spirit of Lavender.

This preparation, which was formerly classed with Spirits, has been very properly transferred to the Tinctures in the

present Pharmacopœia. As the difference is so slight between the 1870 and 1880 preparation, the latter formula only is given.

Oil of Lavender, . . .	8 parts or	2 fl.drachms.
Oil of Rosemary, . . .	2 parts or	30 minims.
Cinnamon, in coarse powder,	18 parts or	230 grains.
Cloves,	4 parts or	52 grains.
Nutmeg,	10 parts or	128 grains.
Red Saunders, coarse powder,	8 parts or	103 grains.
Alcohol (by weight), . .	680 parts or	23 fl.ounces.
Water,	270 parts or	7 $\frac{5}{8}$ fl.ounces.
Diluted Alcohol, suffi- cient to make . . .	1000 parts or	2 pints.

Dissolve the Oils in the Alcohol and add the Water, crush the Nutmeg in a mortar, mix with it the Cinnamon, Cloves, and Red Saunders, and reduce the mixture by grinding to a coarse powder; moisten the mixture with a sufficient quantity of the Alcoholic solution of the Oils, pack it firmly in a cylindrical percolator, gradually pour upon it the remainder of the Alcoholic solution and, afterward, diluted Alcohol until 1000 parts or 2 pints of the Tincture are obtained. U. S. 1880.

The Br. P. formula is so similar that it need not be repeated.

Tincture of Lavender Compound is an agreeable stomachic and aromatic. The dose is $\frac{1}{2}$ to 2 fl.drachms.

3505. Tinctura Limonis. Br.

Tincture of Lemon Peel.

Fresh Lemon Peel, cut small, . . .	2 $\frac{1}{2}$ ounces av.
Proof Spirit,	20 fl.ounces.

Macerate for seven days in a closed vessel, with occasional agitation, strain, press, and filter; then add sufficient Proof Spirit to make 20 fl.ounces. It might with advantage be made much stronger.

This is used for flavoring and given as an aromatic stimulant in doses of $\frac{1}{2}$ to 2 fl.drachms.

3506.

Tinctura Lobeliæ.*Tincture of Lobelia.*

Lobelia (herb), in No. 40
 powder, 20 parts or $6\frac{1}{4}$ ounces av.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Moisten the powder with 6 fl.ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Lobelia (herb), in No. 40 powder, . . $6\frac{1}{4}$ ounces av.
 Diluted Alcohol, sufficient to make . . 2 pints.

Make a Tincture by water-bath percolation as directed for making Tincture Arnica Root (3440).

The Br. P. directs Lobelia $2\frac{1}{2}$ ounces av. with Proof Spirit to make 20 fl.ounces of Tincture.

The G. P. directs 1 part of Lobelia with 10 parts of diluted Alcohol. The dose is 5 to 15 minims.

The dose of the U. S. and Br. preparations is from 10 to 30 minims.

3507. **Tinctura Lobeliæ Ætherea. Br.***Ethereal Tincture of Lobelia.*

Lobelia, in coarse powder, $2\frac{1}{2}$ ounces av.
 Spirit of Ether (2971), 20 fl.ounces.

Macerate for seven days in a closed vessel, with occasional agitation, then strain, press, filter, and add sufficient Spirit of Ether to make 20 fl.ounces.

Dose, 10 to 30 minims.

3508.

Tinctura Lupulinæ.*Tincture of Lupulin.*

This was official in the 1870 U. S. P., as follows:

Lupulin, $4\frac{3}{8}$ ounces av.
 Alcohol, sufficient to make 2 pints.

Pack the Lupulin in a narrow cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained.

Although this Tincture was omitted from the 1880 Pharmacopœia, it will be frequently called for. It may be made by water-bath percolation in the same manner as other Tinctures.

This must not be mistaken for the Br. official *Tinctura Lupuli* or Tincture of Hop. See *Tinctura Humuli*.

3509. *Tinctura Matico.*

Tincture of Matico.

Matico, in No. 40 powder, . . . 10 parts or 3 ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the Matico with 3 ounces of Diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Matico, in No. 40 powder, 3 ounces av.

Diluted Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as directed for making *Tincture Belladonna* (3446).

3510. *Tinctura Moschi.*

Tincture of Musk.

Musk, 10 parts or 337 grains.

Alcohol, 45 parts or 4 $\frac{3}{8}$ fl.ounces.

Water, 45 parts or 3 $\frac{3}{4}$ fl.ounces.

Diluted Alcohol, sufficient

to make, 100 parts or 8 fl.ounces.

Rub the Musk in a mortar, first with a little of the Water, until a smooth mixture is made, and then with the remainder of the Water; transfer the whole to a bottle, add the Alcohol, and macerate the mixture for seven days, occasionally shaking the bottle, then filter through paper, adding through the filter

enough diluted Alcohol to make the Tincture measure half a pint. U. S. 1880.

As good grain Musk (which is to be used in this preparation) is worth from \$25.00 to \$35.00 per ounce, it will be advisable to touch this official very lightly.

The G. P. directs Musk 1 part, diluted Alcohol, Water, each 25 parts, made as above.

3511. Tinctura Myrrhæ.

Tincture of Myrrh.

Myrrh, in No. 30 powder, 20 parts or $5\frac{1}{2}$ ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Mix the powder with a pint and a half of Alcohol and macerate for seven days in a closed vessel, then filter through paper, adding through the filter enough Alcohol to make 2 pints of Tincture. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Myrrh, in No. 30 powder, $5\frac{1}{2}$ ounces av.

Alcohol, sufficient to make 2 pints.

Make a Tincture in the same manner as directed for making Tincture Guaiac by water-bath percolation.

The Br. P. directs Myrrh, in coarse powder, $2\frac{1}{2}$ ounces av. with Rectified Spirit to make 20 fl.ounces of Tincture.

The G. P. formula is Myrrh 1 part, Alcohol 5 parts, made by maceration.

3512. Tinctura Nucis Vomicae.

Tincture of Nux Vomica.

Nux Vomica, in No. 60

powder, 20 parts or $5\frac{3}{4}$ ounces av.

Alcohol, } each sufficient.

Water, }

Mix Alcohol and Water in the proportion of 8 parts by weight (19 fl.ounces) of Alcohol to 1 part (2 fl.ounces) of Water; moisten the powder with 20 parts or 6 fl.ounces of the mixture and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour menstruum upon it

until the *Nux Vomica* is exhausted. Reserve the first 90 parts of the percolate, evaporate the remainder to 10 parts, and mix with the reserved portion. Of this Tincture (which should measure about 2 pints), take any convenient number of parts, and, by means of a water-bath, evaporate to dryness; weigh the resulting extract, and, from its weight, calculate the quantity of dry extract contained in the 100 parts of Tincture; then dissolve the dried extract in the remainder of the Tincture, and add enough of the above menstruum to make the product weigh so many parts that each 100 parts of Tincture shall contain 2 parts of dry extract. Lastly, mix thoroughly, and filter through paper. U. S. 1880.

The Tincture thus prepared should represent about 20 parts of *Nux Vomica* in 100 parts, and would, therefore, measure about 2 pints.

Although the U. S. 1880 formula has the advantage of making a preparation of definite strength, it will be seldom used by the majority of druggists, because of the trouble and nicety of calculation required to obtain the percentage of dry extract.

The 1880 preparation is only about $\frac{2}{3}$ the strength of the 1870, which was 8 tr.ounces of the drug to make 2 pints of Tincture, and the process of macerating with gentle heat, which was formerly employed, was of great advantage.

A simple method of making this Tincture of the required strength is as follows:

Extract of <i>Nux Vomica</i> , dry, . . .	60	grains.
Alcohol,	14	fl.ounces.
Water,	1½	fl.ounces.

Mix the Alcohol and Water and dissolve the extract in the mixture.

The following formula will be found most expedient for exhausting the *Nux Vomica*, and is sufficiently accurate for all practical purposes:

MADE BY WATER-BATH PERCOLATION.

<i>Nux Vomica</i> , in No. 60 powder, . .	5½	ounces av.
Alcohol, }	each sufficient to make . 2 pints.	
Water, }		

Mix Alcohol and Water in the proportion of 19 fl.ounces of Alcohol to 2 fl.ounces of Water, and, having moistened the Nux Vomica with 8 ounces of the mixture, macerate it for 24 hours in a closed vessel in a warm place, then pack firmly in the water-bath percolator, pour upon it a pint and a half of menstruum and set in a warm place for two days; then heat moderately, and, after one hour, begin to percolate, adding menstruum to the drug, and continuing the heat and percolation until 2 pints of Tincture are obtained.

The dose of this Tincture is 5 to 20 minims.

The Br. P. formula is Extract of Nux Vomica 133 grains, distilled Water 4 fl.ounces, Rectified Spirit sufficient to make 20 fl.ounces. One fl.ounce contains 1 grain of the alkaloids of Nux Vomica. The dose is 10 to 20 minims.

The G. P., under the title *Tinctura Strychni*, directs Nux Vomica 1 part, diluted Alcohol 10 parts, to be made into a Tincture by maceration. The dose is 5 to 15 minims.

3513.

Tinctura Opii.

Tincture of Opium (Laudanum).

As the U. S. 1870 and 1880 preparations are both used, the formulas are given :

	1870.	1880.
Powd. Opium,	2 $\frac{3}{4}$ ounces av.	10 parts or 3 $\frac{1}{8}$ ounces av.
Water, . . .	16 fl.ounces.	40 parts or 12 $\frac{3}{4}$ fl.ounces.
Alcohol, . . .	16 fl.ounces.	40 parts or 15 $\frac{3}{8}$ fl.ounces.
Diluted Alcohol, sufficient		
to make . . .	2 pints.	100 parts or 2 pints.

(For 1870 direction see U. S. P. 1870.)

Rub the Opium in a mortar with the Water, previously heated to the temperature of 90° C. (194° F.), until a smooth mixture is made, and macerate for 12 hours, then add the Alcohol, mix thoroughly, and transfer the whole to a conical percolator; return to the percolator the first portion of percolate until it becomes clear, and, when the liquid ceases to drop, gradually pour on diluted Alcohol, continuing the percolation until 2 pints of Tincture are obtained. U. S. 1880.

Although powdered Opium is directed to be used in this as well as all other preparations of Opium, it has not heretofore been used by one druggist in a hundred. Two causes have tended to bring about this result; first, the higher price of powdered Opium, and, second, its liability to sophistication, as it has been formerly furnished; but now that powdered Opium, bearing the assay label of reliable houses, may be obtained, this excuse is no longer tenable.

No process for making Tincture of Opium will be found so efficient and economical as the process of water-bath percolation.

MADE BY WATER-BATH PERCOLATION.

(1870 U. S. P. Standard.)

Powdered Opium,	2 $\frac{3}{4}$ ounces av.
Water,	1 pint.
Alcohol,	1 pint.
Diluted Alcohol, sufficient to make	2 pints.

Mix the Opium with the Water previously heated to boiling, and macerate for 12 hours, then, having covered the perforated diaphragm of the water-bath percolator with coarse cloth, pour the mixture upon it; heat to about 80° C. (176° F.) for two hours, then add the Alcohol and, after half an hour, begin to percolate, adding diluted Alcohol to the drug when the liquid has all disappeared from the surface, and continuing the heat and percolation until 2 pints of Tincture are obtained. Lastly, after standing a day or two, filter through paper.

If moist Opium is used instead of powdered, 3 $\frac{3}{8}$ ounces av. may be used instead. It should be cut in small pieces and rubbed with hot water in a mortar to a uniform pasty mass, then macerated for 10 or 12 hours in a warm place, the Alcohol added, and percolated either by the ordinary process or by water-bath percolation.

If it is desired to make Tincture of Opium of the 1880 strength by water-bath percolation, simply substitute the quantities mentioned in the 1880 formula and proceed as directed.

Tincture of Opium is given as an anodyne in doses of 10 to 30 minims. It is also used extensively for external application in liniments, etc.

The Br. P. directs Opium, in powder, $1\frac{1}{2}$ ounce with Proof Spirit sufficient to make 20 fl.ounces. Made by maceration. Dose, 5 to 40 minims.

The G. P., under the title *Tinctura Opii Simplex*, directs Opium, in powder, 1 part, diluted Alcohol 5 parts, Water 5 parts. To be made by maceration.

3514. *Tinctura Opii Acetata.*

Acetated Tincture of Opium.

This preparation was official in the U. S. P. 1870, and is now occasionally called for.

Powdered Opium,	2 tr.ounces.
Distilled Vinegar,	12 fl.ounces.
Alcohol,	8 fl.ounces.

Rub the Opium with the distilled Vinegar, then add the Alcohol and, having macerated for seven days, express and filter through paper. U. S. 1870.

This Tincture is no longer official, and would not be here noticed except that it is sometimes called for, and the formula is convenient for reference. It has no advantages not possessed by Vinegar of Opium, and two preparations so similar are unnecessary.

3515. *Tinctura Opii Ammoniata.* Br.

Ammoniated Tincture of Opium.

Opium, in powder,	100 grains.
Saffron, cut small,	180 grains.
Benzoic Acid,	180 grains.
Oil of Anise,	1 fl.drachm.
Strong Solution of Ammonia,	4 fl.ounces.
Rectified Spirit,	16 fl.ounces.

Macerate for seven days in a well-closed vessel, with occasional agitation, then strain, press, filter, and add sufficient Rectified Spirit to make 20 fl.ounces.

The dose is 30 to 60 minims.

3516. Tinctura Opii Benzoica. G. P.*Benzoated Tincture of Opium — Paregoric Elixir.*

Opium, in powder,	1 part.
Oil of Anise,	1 part.
Camphor,	2 parts.
Benzoic Acid,	4 parts.
Diluted Alcohol,	192 parts.

Prepare a Tincture by maceration.

This is similar to the U. S. Camphorated Tincture of Opium, known as Paregoric, but contains a larger proportion of Camphor and Benzoic Acid.

3517. Tinctura Opii Camphorata.*Camphorated Tincture of Opium — Paregoric.*

Powdered Opium,	4 parts or 56 grains.
Benzoic Acid,	4 parts or 56 grains.
Camphor,	4 parts or 56 grains.
Oil of Anise,	4 parts or 1 fl.drachm.
Glycerin,	40 parts or 1 fl.ounce.
Diluted Alcohol, sufficient to make	1000 parts or 2 pints.

Add 28 fl.ounces of diluted Alcohol to the other ingredients contained in a suitable vessel and macerate for seven days, frequently stirring, then filter through paper in a well-covered funnel and pass enough diluted Alcohol through the filter to make 2 pints. U. S. 1880.

Sixty grains of powdered Extract of Liquorice added makes a darker and more desirable color.

The following formula will be found very convenient for making Paregoric quickly or extemporaneously:

RAPID PROCESS FOR MAKING PAREGORIC.

Tincture of Opium (1870),	1 5/8 fl.ounces.
Benzoic Acid,	60 grains.
Extract of Liquorice, powdered,	60 grains.
Camphor,	40 grains.

Oil of Anise,	1	fl.drachm.
Glycerin,	1	fl.ounce.
Alcohol,	15	fl.ounces.
Water,	15	fl.ounces.

Dissolve the Benzoic Acid, Camphor, and Oil of Anise in the Alcohol, mix the Glycerin, Tincture of Opium, and Water, and dissolve the Extract of Liquorice in the mixture; then mix the two solutions and, after standing a few hours, filter through paper.

The dose is 20 to 60 minims or more.

Tinctura Camphoræ Composita, Br., and *Tinctura Opii Benzoinica, G. P.*, are corresponding but dissimilar preparations.

3518. *Tinctura Opii Crocata. G. P.*

Tincture of Opium and Saffron — Sydenham's Laudanum.

Opium, in powder,	30 parts.
Saffron,	10 parts.
Cloves,	2 parts.
Cinnamon,	2 parts.
Diluted Alcohol,	150 parts.
Water,	150 parts.

Prepare a Tincture by maceration. The dose is 5 to 20 minims.

This is the same strength of Opium as the official Tincture Opium.

3519. *Tinctura Opii Deodorata.*

Deodorized Tincture of Opium.

	1870.	1880.
Powd. Opium,	2¾ ounces av.	10 parts or 3¼ ounces av.
Ether,	8 fl.ounces.	20 parts or 8½ fl.ounces.
Alcohol,	8 fl.ounces.	20 parts or 8 fl.ounces.
Water, sufficient		
to make	2 pints.	100 parts or 2 pints.

Rub the Opium in a mortar with 12 ounces of Water, gradually added, until thoroughly softened, and macerate for 12 hours; then express, and repeat the operation twice, using the

same amount of Water each time; mix the expressed liquids, evaporate the mixture to $3\frac{1}{2}$ ounces and, when it has cooled, shake it repeatedly with the Ether in a bottle. When the ethereal solution has separated, by standing, pour it off and evaporate the remaining liquids until all traces of Ether have disappeared; mix the residue with a pint of Water and filter the mixture through paper. When the liquid has ceased to pass, add enough Water through the filter to make the filtered liquid measure a pint and a half. Lastly, add the Alcohol and mix them. U. S. 1880.

The directions for making are essentially the same in both revisions. The proportion of Opium is the same as in the ordinary Tincture of Opium.

A method of making Deodorized Tincture of Opium, in which Petrolatum is used instead of Ether for separating the objectionable properties, has recently been proposed by E. Rother (A. J. P., February, 1883). If this process is rightly and carefully conducted it will be attended with good results, but it requires more care and attention than druggists usually bestow upon it.

The following formula will be found the most expedient and economical of any that has been proposed. The Opium may be exhausted either by water-bath percolation, or as the Pharmacopœia directs, but the water-bath process is to be preferred.

3520. Deodorized Tincture of Opium.

Fenner's Improved Process.

(1870 U. S. P. Standard.)

Powdered Opium,	2¾ ounces av.
Alcohol,	8 fl.ounces.
Gasoline (Petroleum Ether),	8 fl.ounces.
Water, sufficient to make	2 pints.

Mix the Opium with 12 ounces of hot Water and macerate for 12 hours; having covered the perforated diaphragm of the water-bath percolator with burlap or coarse cloth, pour the mixture upon it and heat it for four hours to about 85° C. (185° F.), then begin to percolate slowly, adding Water to the drug, and continuing the heat and percolation until a pint and a half has passed, or until the drug is exhausted; evaporate this percolate to 6 fl.ounces and, when cool, mix it in a quart bottle with the Gasoline and shake it violently and frequently during 12 hours; then, having inserted a small plug of cotton

in the neck, and stopped the lower orifice of a glass funnel with a cork, pour the mixture in it and allow it to stand an hour to separate; then loosen the cork so that the lower stratum of liquid may be drawn off, and allow the tarry matter and the supernatant Gasoline to remain in the funnel; evaporate from the drawn-off liquid thus obtained (which is the depurated solution of Opium) all traces of Gasoline, mix it with a pint of Water and filter, passing through the filter sufficient Water to make a pint and a half of the filtered liquid; to this add the Alcohol and, after standing a few days, filter through paper.

As thus prepared the Tincture contains the full strength of the Opium, deprived of its noxious and objectionable properties. The Gasoline is more efficient than the Ether for the purpose required and is entirely inexpensive.

If it is desired to make this Tincture of the 1880 strength, substitute the proportions of the 1880 formula.

3521. Tinctura Pimpinellæ. G. P.

Tincture of Pimpinell.

Pimpinell Root, 1 part.
Diluted Alcohol, 5 parts.

Make a Tincture by maceration.

3522. Tinctura Physostigmatis.

Tincture of Calabar Bean.

Physostigma, in No. 40
powder, 10 parts or $2\frac{3}{4}$ ounces av.
Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 3 ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Calabar Bean, in No. 40 powder, . . . $2\frac{3}{4}$ ounces av.
Alcohol, sufficient to make 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for making Tinctura Gelsemii (3484).

This is a narcotic sedative, used for neuralgia, etc. The dose is 10 to 30 minims.

3523. Tinctura Podophylli. Br.*Tincture of Podophyllum (Resin).*

Resin of Podophyllum, 160 grains or 1 part.

Rectified Spirit, . . . 20 fl.ounces or 54.68 fl.parts.

Dissolve and filter. It contains 1 grain of the Resin in 1 fl.drachm. The dose is 15 to 60 minims.

Care should be taken not to be misled by the title of this formula as an unofficial Tincture of Podophyllum (Mandrake Root) is sometimes used.

3524. Tinctura Pyrethri.*Tincture of Pyrethrum (Pellitory).*

Pyrethrum, in No. 40 powder, 20 parts or 5½ ounces av.

Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 5 ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Pellitory, in No. 40 powder, . . . 5½ ounces av.

Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for making Tinctura Cimicifugæ (3467).

The Br. P. directs Pellitory Root 4 ounces with Rectified Spirit to make 20 fl.ounces of the Tincture.

3525. Tinctura Quassiaë.*Tincture of Quassia.*

Quassia, in No. 40 powder, 10 parts or 3 ounces av.

Diluted Alcohol, sufficient

to make . . . 100 parts or 2 pints.

Moisten the powder with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Quassia, in No. 40 powder, 3 ounces av.

Diluted Alcohol, sufficient to make . . . 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for making Tincture Arnica Root.

The Br. P. directs Quassia Wood, in chips, $\frac{3}{4}$ ounce av. to be macerated for seven days with Proof Spirit sufficient to make 20 fl.ounces. It is only about one third the strength of the U. S. preparation.

Tincture of Quassia is a bitter stomachic, the dose of the U. S. being 15 to 60 minims.

3526. Tinctura Quininæ. Br.*Tincture of Quinine.*

Hydrochlorate of Quinine, 160 grains.

Tincture of Orange Peel, 20 fl.ounces.

Dissolve the Hydrochlorate of Quinine in the Tincture with the aid of a little heat, then allow the solution to remain in a closed vessel for three days, shaking it occasionally, and afterwards filter.

The dose is $\frac{1}{2}$ to 2 fl.drachms, a fl.drachm containing 1 grain of the Quinine salt.

A Tincture may be made from any other salt of Quinine by using the same quantity of the salt with 20 fl.ounces of Tincture of Orange Peel, or by dissolving 40 minims of Oil of Orange in 10 fl.ounces of Alcohol, and adding the Quinine salt, dissolving, then adding 10 fl.ounces of Water.

3527. Tinctura Quininæ Ammoniata. Br.*Ammoniated Tincture of Quinine.*

Sulphate of Quinine, 160 grains.

Solution of Ammonia, $2\frac{1}{2}$ fl.ounces.

Proof Spirit, $17\frac{1}{2}$ fl.ounces.

Dissolve the Quinine salt in the Proof Spirit by the aid of a little heat and add the Solution of Ammonia.

A fl.drachm contains 1 grain of the Quinine salt. The dose is $\frac{1}{2}$ to 2 fl.drachms.

3528.

Tinctura Rhei.*Tincture of Rhubarb.*

Rhubarb, 12 parts or 3¾ ounces av.
 Cardamom, in fine powder, . 2 parts or 270 grains.
 Diluted Alcohol, sufficient
 to make 100 parts or 2 pints.

Mix the Rhubarb and Cardamom and reduce the mixture to a moderately coarse (No. 40) powder, moisten the powder with 4 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

This may also be made from the same ingredients, by water-bath percolation, as directed for making Tincture Arnica Root.

The Br. P. directs Rhubarb Root, in No. 20 powder, 2 ounces av., Cardamom, Coriander, Saffron, each, bruised, ¼ ounce av., with Proof Spirit to make 20 fl.ounces.

Tincture of Rhubarb is given as a stomachic in doses of 1 to 2 fl.drachms, and as a purgative in doses of ½ to 1 fl.ounce.

3529. Tinctura Rhei Aquosa. G. P.*Aqueous Tincture of Rhubarb.*

Rhubarb, 100 parts.
 Borate of Sodium (Borax), 10 parts.
 Pure Carbonate of Sodium, 10 parts.
 Water, 900 parts.
 Cinnamon Water, 150 parts.
 Alcohol, 90 parts.

Heat the Water to boiling, pour it upon the coarsely-cut Rhubarb (freed from powder), the Borate of Sodium and Carbonate of Potassium, and allow them to digest in a closed vessel for a quarter of an hour, then add the Alcohol and set the mixture aside for one hour. Now strain the mixture through a woollen cloth and express gently the undissolved portion. Finally, add the Cinnamon Water in the proportion of 150 parts to 850 parts of the strained liquid.

The dose of this Tincture is 1 to 4 fl.drachms as a laxative.

3530. Tinctura Rhei Aromatica.*Aromatic Tincture of Rhubarb—Spiced Tincture of Rhubarb.*

Rhubarb,	20 parts or	6¾ ounces av.
Cinnamon,	4 parts or	1¼ ounces av.
Cloves,	4 parts or	1¼ ounces av.
Nutmeg,	2 parts or	275 grains.
Diluted Alcohol, suffi-		
cient to make	100 parts or	2 pints.

Mix the Rhubarb, Cinnamon, Cloves, and Nutmeg and reduce the mixture to a moderately coarse powder, moisten the powder with 15 parts or 5 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

From the same ingredients as directed make a Tincture by water-bath percolation in the same manner as directed for making *Tinctura Aurantii Amari* (3443).

This is given for diarrhoea of children especially, acting first as a purgative, then as an astringent. The dose is a teaspoonful to a tablespoonful.

3531. Tinctura Rhei Dulcis.*Sweet Tincture of Rhubarb.*

Rhubarb,	8 parts or	2½ ounces av.
Liquorice (Root), . . .	4 parts or	1¼ ounces av.
Anise,	4 parts or	1¼ ounces av.
Cardamom,	1 part or	136 grains.
Diluted Alcohol, suffi-		
cient to make	100 parts or	2 pints.

Mix the Rhubarb, Liquorice, Anise, and Cardamom and reduce them to a moderately coarse (No. 40) powder, moisten the powder with 15 parts or 5 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

From the same ingredients as directed make a Tincture by water-bath percolation in the same manner as directed for making Tincture of Arnica Root (3440).

This is a weak, pleasant Tincture of Rhubarb, generally given to children in doses of a teaspoonful to a tablespoonful.

3532. Tinctura Rhei et Sennæ.

Tincture of Rhubarb and Senna.

Although this Tincture has been dismissed from the present revision of the U. S. Pharmacopœia it is still considerably used. It was formerly known as *Warner's Gout Cordial*, and has been an officinal preparation for many generations. Why it should be dismissed and other much less frequently used preparations retained is not apparent. The following is the formula:

Rhubarb, in moderately coarse powder,	480	grains.
Senna, in moderately coarse powder, .	120	grains.
Coriander, in moderately coarse powder,	60	grains.
Fennel, in moderately coarse powder,	60	grains.
Liquorice Extract, in moderately coarse powder,	30	grains.
Raisins, deprived of their seeds, . .	6½	ounces av.
Diluted Alcohol,	3	pints.

Macerate for seven days, express, and filter through paper.

The dose is a teaspoonful as a laxative.

3533. Tinctura Rhei Vinosa. G. P.

Vinous Tincture of Rhubarb.

This preparation should properly be included with the Wines instead of the Tinctures, but is classed as above in the G. P.

Rhubarb,	8	parts.
Orange Peel,	2	parts.
Cardamom,	1	part.
Sherry Wine,	100	parts.
Sugar, a sufficient quantity.		

Make a Tincture by maceration and expression and in the filtered liquid obtained dissolve one seventh of its weight of Sugar. The dose is 2 to 4 fl.drachms or more.

3534. *Tinctura Sabinæ.* Br.

Tincture of Savine.

Savine Tops, coarsely powdered, . . . 2½ ounces av.

Proof Spirit, 20 fl.ounces.

Make 20 fl.ounces of Tincture by maceration and percolation.

This is given as a tonic emmagogue. The dose is 20 to 60 minims.

3535. *Tinctura Sanguinariæ.*

Tincture of Sanguinaria (Bloodroot).

Sanguinaria, in No. 60 powder, 15 parts or 4¾ ounces av.

Alcohol, 1 each sufficient.

Water, 1

Mix Alcohol and Water in the proportion of 2 parts (by weight), or 24 fl.ounces of Alcohol with 1 part (by weight), or 10 fl.ounces of Water, moisten the powder with 3 ounces of the mixture and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour the menstruum upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Bloodroot, in No. 60 powder, . . . 4¾ ounces av.

Alcohol, 24 fl.ounces.

Water, 10 fl.ounces.

Diluted Alcohol, sufficient to make 2 pints.

Mix the Alcohol and Water, moisten the powder with 4 ounces of the mixture and macerate for 24 hours in a closed vessel, transfer it to the water-bath percolator, pack firmly, pour upon it the remainder of the menstruum and set in a warm place for two days, then heat moderately and, after one hour, begin to percolate; when the liquid has all disappeared from the surface of the drug add sufficient diluted Alcohol,

through the percolator, to make the Tincture measure 2 pints. Lastly, after standing a few days, filter through paper.

This is given as a stimulating expectorant and tonic in doses of 10 to 30 minims.

3536. *Tinctura Saponis Viridis.*

Tincture of Green Soap.

Green Soap, 65 parts or 10 ounces av.

Oil of Lavender, 2 parts or 3 fl.drachms.

Alcohol, sufficient to make 100 parts or 1 pint.

Mix the Soap and the Oil of Lavender with 33 parts or 6 fl.ounces of Alcohol and let the mixture macerate until the Soap is dissolved, then filter through paper, adding Alcohol through the filter until 100 parts or 1 pint of Tincture is obtained. U. S. 1880.

This preparation may be quickly made by heating the ingredients together in the water-bath percolator until the Soap is dissolved and then drawing off the liquid.

3537. *Tinctura Scillæ.*

Tincture of Squill.

Squill, in No. 30 powder, . . 15 parts or $4\frac{3}{4}$ ounces av.

Diluted Alcohol, sufficient

to make 100 parts or 2 pints.

Moisten the powder with 6 ounces of diluted Alcohol and macerate for 24 hours, then pack it moderately in a conical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

This may be made by water-bath percolation in the same manner as Tincture of Belladonna.

The Br. P. directs Squill $2\frac{1}{2}$ ounces av., Proof Spirit to make 20 fl.ounces. Made as the U. S. preparation.

The G. P. directs Squill 1 part, diluted Alcohol 5 parts, made by maceration.

Tincture of Squill is diuretic and expectorant. The dose is 10 to 30 minims.

3538. Tinctura Senegæ. Br.*Tincture of Senega.*

Senega Root, in No. 40 powder, . . . 2½ ounces av.

Proof Spirit, to make 20 fl.ounces.

Macerate the Senega for 48 hours in 15 fl.ounces of the Spirit, percolate and add Spirit through the percolator to make 20 fl.ounces of Tincture.

It may also be made by water-bath percolation.

This is a tonic expectorant. The dose is ½ to 2 fl.drachms.

3539. Tinctura Sennæ. Br.*Tincture of Senna — Compound Tincture of Senna.*

Senna, broken small, 2½ ounces av.

Raisins, freed from seeds, 2 ounces av.

Caraway Fruit (Seeds), bruised, . . . ½ ounce av.

Coriander Fruit (Seeds), bruised, . . . ½ ounce av.

Proof Spirit, to make 20 fl.ounces.

Macerate the ingredients for 48 hours in 15 fl.ounces of the Spirit, then percolate, adding sufficient Spirit through the percolator to produce 20 fl.ounces of Tincture.

This may also be made by water-bath percolation in the same manner as is directed for Tincture Belladonna.

This preparation was formerly known as *Elixir Salutis*. It is an excellent laxative in doses of a tablespoonful or more.

3540. Tinctura Serpentariæ.*Tincture of Serpentaria — Tincture of Serpentry.*

Serpentaria, in No. 40 powder, 10 parts or 3 ounces av.

Diluted Alcohol, sufficient to

make 100 parts or 2 pints.

Moisten the powder with 3 ounces of diluted Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour diluted Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

With the same ingredients make a Tincture by water-bath percolation as directed for making Tincture of Arnica Root (3440).

The Br. P. directs Serpentry 2½ ounces, Proof Spirit to make 20 fl.ounces. Made by maceration and percolation as directed in the preceding.

The dose is ½ to 2 fl.drachms as a stimulant and diaphoretic.

3541. Tinctura Sumbul.*Tincture of Sumbul.*

Sumbul, in No. 30 powder, 10 parts or 2¾ ounces av.
Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 10 parts or 3 fl.ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Sumbul, in No. 30 powder, 2¾ ounces av.
Alcohol, sufficient to make 2 pints.

Make a Tincture in the same manner as directed for making Tincture of Gelsemium.

The Br. P. directs Sumbul 2½ ounces av. with Rectified Spirit to make 20 fl.ounces of Tincture.

This is used as a nervine in doses of 10 to 30 minims.

3542. Tinctura Tolutana.*Tincture of Tolu.*

U. S. 1870.

Balsam of Tolu, 3¼ ounces av.
Alcohol, 2 pints.

Macerate the Balsam with the Alcohol until it is dissolved, then filter through paper.

This Tincture contains a larger proportion of Tolu than the U. S. 1880 preparation, and should be used when it is desired to make Syrup of Tolu by the U. S. 1870 formula.

U. S. 1880.

Balsam of Tolu, $2\frac{3}{4}$ ounces av.

Alcohol, sufficient to make 2 pints.

Add the Balsam of Tolu to 30 fl.ounces of Alcohol and macerate until dissolved, then filter through paper, adding through the filter enough Alcohol to make 2 pints.

Both the 1870 and 1880 formulas are given, as the former is still used for making the former official Syrup of Tolu.

This Tincture may be quickly made by the aid of heat. The Balsam and the Alcohol may be put together in a bottle and macerated in a water-bath until the Balsam is dissolved.

The Br. P. directs Balsam of Tolu $2\frac{1}{2}$ ounces av. with sufficient Rectified Spirit to make 20 fl.ounces of Tincture.

The dose is from 20 to 40 minims.

3543. Tinctura Valerianæ.

Tincture of Valerian.

Valerian, in No. 60 powder, 20 parts or 6 ounces av.

Alcohol, } each sufficient to

Water, } make 100 parts or 2 pints.

Mix Alcohol and Water in the proportion of 2 parts (by weight) or 24 fl.ounces of Alcohol to 1 part or 10 fl.ounces of Water; moisten the powder with 15 parts or 5 ounces of the mixture and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour menstruum upon it until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Valerian, in No. 50 powder, 6 ounces av.

Alcohol, } each sufficient to make 2 pints.

Water, }

Mix Alcohol and Water as above and make a Tincture by water-bath percolation in the same manner as directed for making Tincture Calumba.

The Br. P. directs Valerian Root $2\frac{1}{2}$ ounces av. with Proof Spirit to make 20 fl.ounces of the Tincture by maceration and percolation.

The G. P. directs Valerian 1 part with diluted Alcohol 5 parts, to be made by maceration.

Tincture of Valerian is given as a nervine, the dose being 1 to 2 fl.drachms.

3544. *Tinctura Valerianæ Ammoniata.*

Ammoniated Tincture of Valerian.

Valerian, 20 parts or 6 ounces av.
Aromatic Spirit of Ammonia,
sufficient to make . . . 100 parts or 2 pints.

Moisten the powder with 5 ounces of Aromatic Spirit of Ammonia and macerate for 24 hours in a closed vessel, then pack it firmly in a cylindrical glass percolator and gradually pour Aromatic Spirit of Ammonia upon it until 2 pints of Tincture are obtained. U. S. 1880.

The Br. P. directs Valerian Root $2\frac{1}{2}$ ounces av. with Aromatic Spirit of Ammonia to make 20 fl.ounces of Tincture by maceration.

This is used as a stimulant and nervine, the dose being 30 to 60 minims.

3545. *Tinctura Valerianæ Ætherea.* G. P.

Etherial Tincture of Valerian.

Valerian, 1 part.
Spirit of Ether, 5 parts.

Prepare a Tincture by maceration. The dose is 20 to 60 minims.

3546. *Tinctura Vanillæ.*

Tincture of Vanilla.

Vanilla, cut small and bruised, . . 10 parts or 3 ounces av.
Sugar, in coarse powder, . . . 20 parts or 6 ounces av.
Alcohol, } each sufficient to
Water, } make 100 parts or 2 pints.

Mix Alcohol and Water in the proportion of 2 parts (by weight) or 24 fl.ounces of Alcohol to 1 part or 10 fl.ounces of Water, macerate the Vanilla in 50 parts or 1 pint of this mix-

ture for 12 hours, then drain off the liquid and set it aside. Transfer the Vanilla to a mortar, beat it with the Sugar into a uniform powder, then pack it in a percolator and pour upon it the reserved liquid; when this has disappeared from the surface gradually pour on menstruum and continue the percolation until 100 parts or 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

Vanilla, cut small and bruised, . . . 3 ounces av.
 Sugar, granulated, . . . 6 ounces av.
 Alcohol, $\frac{1}{2}$ each sufficient to make . . 2 pints.
 Water, $\frac{1}{2}$

Mix Alcohol and Water in the proportion of 24 fl.ounces of Alcohol to 10 fl.ounces of Water, moisten the Vanilla with 3 ounces of the mixture and macerate in a closed vessel for 24 hours, transfer it to a mortar and beat it thoroughly with the Sugar until it is reduced to a coarse powder, pack this very firmly in the water-bath percolator, pour upon it about a pint and a half of the menstruum and set in a warm place for two days, then heat very moderately and, after one hour, begin to percolate, adding the menstruum to the drug and continuing the heat and percolation until 2 pints of Tincture are obtained. Lastly, after standing a few days, filter through paper.

This Tincture may be used as a flavoring extract but is stronger than is usually sold for that purpose. Formulæ for flavoring extracts of Vanilla will be found on pages 419 and 420.

3547. Tinctura Veratri Viridis.

Tincture of Veratrum Viride (American Hellebore.)

Veratrum Viride, in No.

60 powder, . . . 50 parts or 14½ ounces av.
 Alcohol, sufficient to make 100 parts or 2 pints.

Moisten the powder with 5 ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

The dose is 3 to 10 minims.

MADE BY WATER-BATH PERCOLATION.

Veratrum Viride, in No. 50 powder, 14½ ounces av.

Alcohol, sufficient to make 2 pints.

Make a Tincture by water-bath percolation in the same manner as is directed for making Tincture of Aconite Root (3432).

This Tincture is made to take the place of Norwood's Tincture of Veratrum Viride, which has become popular on account of its reliability. The original Norwood's Tincture is made from the green root of the American Hellebore and is probably superior to any preparation made from the dried root. This Tincture may be prepared from the green root in the same way as is directed for making *Tincturæ Herbarum Recentium*, which see.

The Br. P. formula directs green Hellebore, Rhizome, in No. 40 powder, 4 ounces av. with Rectified Spirit sufficient to make 20 fl.ounces of Tincture, by maceration and percolation. (Although this is called *Tincture of Green Hellebore*, the adjective relates to the color, and not the green or recent root, as is directed for making Norwood's Tincture. See above.)

This is only about one third the strength of the U. S. preparation. The dose is 5 to 20 minims.

The G. P. formula is White Hellebore 1 part, diluted Alcohol 10 parts, being only about one sixth as strong as the U. S. and one half as strong as the Br.

Tincture of Veratrum is used as an arterial sedative in fevers, delirium, etc.

3548. Tinctura Zingiberis.

Tincture of Ginger.

As there is considerable difference in the U. S. 1870 and 1880 preparations, both are given.

	1870.	1880.
Ginger, in No. 40		
powder, . .	8¾ ounces av.	20 parts or 5¾ ounces av.
Alcohol, suffi-		
ent to make . 2	pints.	100 parts or 2 pints.

Moisten the Ginger with 2 ounces of Alcohol and macerate for 24 hours, then pack it firmly in a cylindrical percolator and

gradually pour Alcohol upon it until 2 pints of Tincture are obtained. U. S. 1880.

MADE BY WATER-BATH PERCOLATION.

(1880 U. S. P. Standard.)

Ginger, in No. 40 powder. 5 $\frac{3}{4}$ ounces av.

Alcohol, sufficient to make 2 pints.

Moisten the Ginger with 4 ounces of Alcohol and pack firmly in the water-bath percolator, pour upon it a pint and a half of Alcohol and set in a warm place for two days, then heat very moderately and, after one hour, begin to percolate slowly, adding Alcohol to the drug and continuing the heat and percolation until 2 pints of Tincture are obtained.

The Alcohol remaining in the drug after percolation may be recovered by distillation.

The Br. P. gives two formulas, one of the same title as the U. S., which is made with Ginger, Rhizome, 2 $\frac{1}{2}$ ounces av., with Rectified Spirit sufficient to make 20 fl.ounces, made by maceration and percolation. The other is called *Tinctura Zingiberis Fortier* or *Strong Tincture of Ginger*, and is made with Ginger 10 ounces av., percolated with sufficient Rectified Spirit to make 20 fl.ounces of Tincture.

The G. P. directs Ginger 1 part, diluted Alcohol 5 parts.

Tincture of Ginger is a warm stimulant, the dose being from 10 to 60 minims of the U. S. 1880 preparation.

Unofficial Tinctures.

The foregoing Tinctures are those official in the leading pharmacopœias; besides these are many other Tinctures which are or have been popular, and which are more or less called for, the principal ones being made by the formulæ which follow, which are arranged in classes as much as possible to avoid repetition:

SIMPLE TINCTURES.

3550. Tinctures Containing 10 per cent. of the Drug.

These may be made by the following general formula:

Take of the drug, in powder of the proper fineness, 1 part or 1 ounce.

The menstruum, a sufficient quantity to make . . . 10 parts or 10 fl.ounces.

Moisten the drug with a portion of the menstruum sufficient to cover it and macerate for 24 hours in a warm place, then transfer to a water-bath percolator, add sufficient menstruum to well cover it and heat moderately; after one hour begin to percolate, adding more of the menstruum and continuing the percolation slowly until 10 parts or 10 fl.ounces are obtained. The ordinary process of cold percolation may be employed but does not produce so satisfactory preparations: Some Tinctures are best prepared by maceration altogether. They are designated with a *.

The following Tinctures are prepared after this formula and represent about 10 per cent. of the drug:

UNOFFICIAL TINCTURES—TEN PER CENT.

No.	Tincture Prepared From.	Part Used.	Menstruum.	Dose.
3551	Ailanthus.....	Bark.....	Diluted Alcohol..	½ to 2 fl.drs.
3552	*Ambergris.....	.....	Alcohol.....	For perfume.
3553	Balm Gilead or Poplar Buds..	Buds.....	Alcohol.....	½ to 1 fl.dr.
3554	*Balsam Copaiba.....	Balsam.....	Alcohol.....	1 to 2 fl.drs.
3555	*Balsam Fir.....	Balsam.....	Alcohol.....	1 to 2 fl.drs.
3556	Canella.....	Bark.....	Alcohol.....	1 to 4 fl.drs.
3557	Chamomile (Anthemis).....	Flowers.....	Diluted Alcohol..	½ to 2 fl.drs.
3558	Cocculus Indicus (Fish Berries)	Fruit.....	Alcohol.....	2 to 20 m.
3559	Conium.....	Leaves.....	Diluted Alcohol..	½ to 1 fl.dr.
3560	Delphinium (Staphisagria)....	Seed.....	Alcohol.....	External.
3561	*Euphorbium.....	Gum.....	Alcohol.....	External.
3562	*Galbanum.....	Gum.....	Diluted Alcohol..	1 to 3 fl.drs.
3563	Geranium (Cranesbill).....	Root.....	Diluted Alcohol..	½ to 2 fl.drs.
3564	Gold Thread (Coptis Trif.)..	Root.....	Diluted Alcohol..	½ to 1 fl.dr.
3565	Horse Chestnut.....	Bark.....	Diluted Alcohol..	½ to 1 fl.dr.
3566	*Lactucarium.....	Insp. Juice..	Diluted Alcohol..	20 to 60 m.
3567	*Oxgall.....	Inspissated..	Diluted Alcohol..	1 to 2 fl.drs.
3568	Pareira Brava.....	Rhizome....	Diluted Alcohol..	1 to 2 fl.drs.
3569	Rhododendron (Laurel)....	Leaves.....	Diluted Alcohol..	½ to 1 fl.dr.

3570. Tinctures Containing 15 per cent. of the Drug.

These may be made by the following general formula:

Take of the drug, in proper fineness for
percolation, 2 parts or 2 ounces av.
The menstruum, sufficient to make . . . 14 parts or 14 fl.ounces.

Moisten the drug with a portion of the menstruum sufficient to cover it and macerate for 24 hours in a warm place, then transfer it to the water-bath percolator, add menstruum to cover it, heat moderately and, after one hour, begin to percolate, adding menstruum to the drug and continuing the percolation until 14 parts or 14 fl.ounces of the percolate is obtained.

These may be made by ordinary percolation, but the product is not so satisfactory. Some preparations are better made by maceration than percolation; such are designated with a *.

UNOFFICIAL TINCTURES—FIFTEEN PER CENT.

No.	Tincture Prepared From.	Part Used.	Menstruum.	Dose.
3571	*Amber	Resin	Alcohol	½ to 1 fl.dr.
3572	Blessed Thistle (<i>Carduus</i>)....	.....	Alcohol	1 to 2 fl.dr.
3573	Blue Cohosh (<i>Caulophyllum</i>)..	Root.....	Alcohol	1 to 2 fl.dr.
3574	Cloves, <i>Carophylles</i>	Flow. heads	Alcohol	1 to 2 fl.dr.
3575	Cochineal (<i>Coccus</i>).....	Whole....	Diluted Alcohol.	Coloring.
3576	Dracontium (<i>Skunk Cabbage</i>)..	Root.....	Diluted Alcohol.	1 to 4 fl.dr.
3577	Galangal (<i>Catarrh Root</i>)....	Rhizome..	Diluted Alcohol.	½ to 1 fl.dr.
3578	*Guarana.....	Extract....	Diluted Alcohol.	1 to 2 fl.dr.
3579	Hedge Hyssop (<i>Gratiola</i>)....	Plant.....	Diluted Alcohol.	1 to 2 fl.dr.
3580	Hellebore	Root.....	Diluted Alcohol.	½ to 1 fl.dr.
3581	*Monesia (<i>Chrysophyllum</i>)....	Extract....	Diluted Alcohol.	½ to 2 fl.dr.
3582	Musk Seed (<i>Ambrette</i>).....	Seed	Diluted Alcohol.	½ to 1 fl.dr.
3583	Pulsatilla (<i>Anemone</i>).....	Plant.....	Diluted Alcohol.	10 to 40 m.
3584	Rhus Toxicodend. (<i>Pois. Oak</i>)	Plant.....	Diluted Alcohol.	5 to 40 m.
3585	Vittie-Vayr.....	Root.....	Diluted Alcohol.	15 to 30 m.
3586	Zedoaria	Root.....	Diluted Alcohol.	½ to 1 fl.dr.

3588. Tinctures Containing 20 per cent. of the Drug.

These may be made by the following general formula :

Take of the drug, in proper fineness for

percolation. 3 parts or 3 ounces av.

The menstruum, sufficient to make . . . 15 parts or 15 fl.ounces.

Moisten the drug with a portion of the menstruum sufficient to cover it and macerate for 24 hours in a warm place, then transfer to the water-bath percolator, add menstruum sufficient to well cover the drug, heat moderately and, after one hour, begin to percolate, adding menstruum to the drug and continuing the percolation until 15 parts or 15 fl.ounces of the percolate is obtained.

These may be made by ordinary cold percolation but the product is not so satisfactory. Some preparations are better made by maceration than percolation ; such are designated with a *.

UNOFFICIAL TINCTURES—TWENTY PER CENT.

No.	Tincture Prepared From.	Part Used.	Menstruum.	Dose.
3589	Alkanet or <i>Achusa</i>	Root	Alcohol	Coloring.
3590	Augustura	Bark.....	Diluted Alcohol.	1 to 3 fl.dr.
3591	<i>Aralia Spinosa</i> (Prickly Elder)	Bark.....	Diluted Alcohol.	10 to 60 m.
3592	Arbor Vita (<i>Thuja</i>)	Fresh twigs..	Alcohol	1 to 4 fl.dr.
3593	<i>Aspidosperma</i> (<i>Quebracho</i>)..	Bark.....	Alcohol	1 to 2 fl.dr.
3594	*Balsam Peru.....	Balsam.....	Alcohol	5 to 30 m.
3595	Baptisia (<i>Wild Indigo</i>).....	Root	Alcohol	15 to 60 m.
3596	Blue Flag (<i>Iris Versicolor</i>)...	Root	Alcohol	5 to 15 m.
3597	Boldo	Leaves.....	Alcohol.....	5 to 40 m.

UNOFFICIAL TINCTURES — TWENTY PER CENT. — Continued.

No.	Tincture Prepared From.	Part Used.	Menstruum.	Dose.
3598	Castor Oil Beans (<i>Ricinus</i>)...	Fruit.....	Alcohol	1 to 2 fl.dr.
3599	Contrayerva.....	Root.....	Alcohol	$\frac{1}{2}$ to 1 fl.dr.
3600	Corydalis (Turkey Corn)....	Tubers.....	Diluted Alcohol.	$\frac{1}{4}$ to 2 fl.dr.
3601	Coto.....	Bark.....	Alcohol	15 to 75 m.
3602	Croton Seed.....	Fruit.....	Alcohol	5 to 15 m.
3603	Culver's Root (<i>Leptandra</i>)...	Root.....	Diluted Alcohol.	$\frac{1}{2}$ to 2 fl.dr.
3604	Elecampane.....	Root.....	Diluted Alcohol.	$\frac{1}{2}$ to 2 fl.dr.
3605	Erigeron (Fleabane).....	Plant.....	Diluted Alcohol.	1 to 2 fl.dr.
3606	Eucalyptus.....	Leaves.....	Alcohol	1 to 2 fl.dr.
3607	Guaiacum Wood.....	Wood.....	Diluted Alcohol.	1 to 2 fl.dr.
3608	Kamala, Rottlera.....	Glands.....	Diluted Alcohol.	1 to 2 fl.dr.
3609	*Mastic.....	Resin.....	Alcohol	For cement.
3610	Matico.....	Leaves.....	Diluted Alcohol.	1 to 2 fl.dr.
3611	Orris (<i>Iris Florentina</i>).....	Rhizome....	Diluted Alcohol.	Perfume.
3612	Phytolacca or Poke.....	Berries or root	Diluted Alcohol.	20 to 60 m.
3613	*Red Gum.....	Gum.....	Alcohol	20 to 40 m.
3614	Rose (Red Rose).....	Petals.....	Diluted Alcohol.	Flavoring.
3615	Rosemary.....	Tops.....	Sp. of Rosemary	Flavoring.
3616	Saponaria or Quillaya.....	Bark.....	Diluted Alcohol.	Emulsions.
3617	*Scammony.....	Resin.....	Alcohol	$\frac{1}{2}$ to 1 fl.dr.
3618	Stillingia.....	Root.....	Diluted Alcohol.	10 to 40 m.

COMPOUND AND UNCLASSIFIED TINCTURES.

3619. **Tincture Absinthium Compound** — *Swedish*. — Blessed Thistle, Orange Berries, Galangal Root, each $\frac{1}{2}$ ounce av., Wormwood 1 ounce, diluted Alcohol sufficient to make 16 fl.ounces. Dose, 1 to 3 fl.drachms.

3620. **Tincture Acetate of Copper, Rademacher's.** — Acetate of Copper in crystals, 154 grains. Dissolve in warm Water 4 fl.ounces and add 2 $\frac{1}{2}$ fl.ounces of Alcohol. Dose, 2 to 5 minims.

3621. **Tincture of Aloes, Alkaline** — *Swedish*. — Aloes $\frac{1}{2}$ ounce, Liquorice Extract 1 $\frac{1}{2}$ drachms, Cinnamon Water 8 ounces, diluted Alcohol 8 fl.ounces, Carbonate of Sodium 1 ounce. Digest and strain. Dose, 1 to 4 fl.drachms.

3622. **Tincture Amber Alkaline.** — Rub 2 ounces of Amber with Carbonate of Potassium sufficient to make a soft, pasty mass, dry this and digest it in 16 ounces of Alcohol for 7 days, then filter. Dose, 20 to 30 drops.

3623. **Tincture Ammonia Compound.** — Mastic 120 grains, Alcohol 9 fl.ounces, digest until dissolved, add Oil of Lavender 14 drops, filter and mix well with 20 fl.ounces stronger Water of Ammonia. This is used as an antacid, antispasmodic, and stimulant. *Aqua Lucie* or *Eau de Luce* is made by adding to this 4 drops Oil of Amber. This is given and applied for snake bites, stings of insects, etc. The dose is 10 to 20 drops in water.

3624. Tincture Ammonio-Chloride of Iron.—Chloride of Iron and Ammonium 1 ounce, distilled Water and diluted Alcohol, each 5 fl.ounces. Dissolve. Dose 20 to 60 minims.

3625. Tincture Antiscorbutic — (Paris Codex). — Fresh Horseradish Root 8 ounces, Black Mustard Seed 4 ounces, Muriate of Ammonia 2 ounces, diluted Alcohol 17 fl.ounces, Compound Syrup of Scurvygrass 18 fl.ounces. Macerate 10 days. Dose, 1 to 2 teaspoonfuls.

3626. Tincture Ants — *Tinctura Formicarum*. — This was formerly official in the Ph. G. and was prepared from ants recently collected, cleaned, and bruised, 2 parts or ounces, Alcohol 3 parts or ounces, by weight. Macerated 8 days.

3627. Tincture Astringent — *Dr. Copeland's*. — Catechu $\frac{1}{2}$ ounce, Myrrh $\frac{1}{2}$ ounce, Peruvian Bark $\frac{1}{4}$ ounce, Balsam Peru $1\frac{1}{2}$ drachm, Spirit of Horseradish $1\frac{1}{2}$ ounce, Alcohol 12 fl.ounces. Mix, digest, and, after standing, filter. This is used for spongy gums, etc.

3628. Tincture Bloodroot Acetous — *Tinctura Sanguinariae Acetata Composita*. — This is an Eclectic preparation, called also *Acetous Emetic*. Bloodroot, Lobelia, Skunk Cabbage Root, each 2 ounces, distilled Vinegar 2 pints, Alcohol 2 fl.ounces. Macerate and percolate the drugs with the Vinegar and add the Alcohol. In small doses it is an excellent expectorant; in doses of a teaspoonful it is an emetic. Repeat if necessary.

3629. Tincture Bloodroot Compound — *Tinctura Sanguinariae Composita*. — This is made the same as the above except that diluted Alcohol is used instead of Vinegar. The uses and dose are the same.

3630. Tincture Cactus — *Tincture of Night Blooming Cereus*. — The fresh flowers and stems of Cactus Grandiflora cut in small pieces and bruised, 5 ounces, Alcohol 1 pint. Macerate for two weeks with occasional agitation, then filter. A *Saturated* Tincture may be made by preparing the fresh flowers as directed and adding sufficient Alcohol to just cover them. This is usually sold as Fluid Extract of Cactus. The dose of the weaker Tincture is 5 to 10 drops for heart disease, etc.

3631. Tincture Caulophyllum Compound — *Blue Cohosh Compound* — Amer. Disp. — Blue Cohosh 2 ounces, Ergot 1 ounce, Water Pepper (Smartweed) 1 ounce, Oil of Savin 30 minims, Alcohol sufficient to make 24 fl.ounces of Tincture. Macerate or percolate. This is an Emmenagogue, given in doses of 15 drops to 1 fl.drachm.

3632. Tincture Cimicifuga Compound — *Black Cohosh Compound* — Amer. Disp. — This is prepared by mixing Tincture of Black Cohosh 4 parts, Tincture of Bloodroot 2 parts, and Tincture of Poke Root 1 part. It is used for Rheumatism, etc, the dose being 10 to 30 minims.

3633. Tincture Cinchona Ammoniated. — This is made by percolating or macerating Cinchona 2 ounces with Aromatic Spirit of Ammonia sufficient to make 16 fl.ounces. The dose is $\frac{1}{2}$ to 1 teaspoonful.

3634. Tincture Cochineal Ammoniated.—Cochineal $\frac{1}{2}$ ounce, Water of Ammonia $\frac{1}{2}$ ounce, Alcohol 8 fl.ounces. Macerate and filter. Used for whooping cough, etc. Dose, 5 to 10 drops.

3635. Tincture Cockroaches—*Tinctura Blatte*.—This is prepared from dried Cockroach, in No. 60 powder, 2 ounces av., Alcohol 10 fl.ounces, by maceration and percolation. The dose is 20 to 30 minims.

3636. Tincture Colchicum Seed Compound.—Colchicum Seed, in fine powder, 2 ounces, Black Cohosh, in fine powder, 3 ounces, Diluted Alcohol sufficient to make 2 pints, by maceration and percolation. The dose is 15 to 30 minims for rheumatism, etc.

3637. Tincture Corydalis Compound—Amer. Disp.—Turkey Corn, Yellow Dock, Tag Alder, Figwort, Mandrake, each 1 ounce, diluted Alcohol sufficient to make 22 fl.ounces. Make a Tincture by maceration and percolation and dissolve 4 ounces of Sugar in the liquid. The dose is from 1 to 4 fl.drachms as an alterative. It is also called *Scudder's Alterative*.

3638. Tincture Curcuma or Turmeric.—Turmeric, in fine powder, 4 ounces, Alcohol sufficient to make a pint. Macerate and percolate. This is used for coloring alcoholic solutions yellow.

3639. Tincture Elaterium.—Elaterium 8 grains, Alcohol 8 fl.ounces. Triturate the Elaterium first with a small portion of the Alcohol, then add the remainder. The dose is $\frac{1}{2}$ to 2 fl.drachms as a hydrogogue cathartic.

3640. Tincture Gentian Ammoniated—*Elixir Antiscrofuleux*. Fr.—(Paris Codex).—Gentian 1 ounce, Carbonate of Ammonium $\frac{1}{4}$ ounce, diluted Alcohol 32 fl.ounces. Make a Tincture. For acid stomach and low spirits. Dose, 1 to 2 fl.drachms.

3641. Tincture Hydrastis Compound—Amer. Disp.—Hydrastis, Lobelia Seed, each 2 ounces, diluted Alcohol sufficient to make 1 pint. This is used externally.

3642. Tincture Iodine Decolorized.—This may be made by adding stronger Water of Ammonia 1 part to Tincture of Iodine 5 parts, and then adding a few drops of Carbolic Acid. See, also, 1766, which is generally preferred.

3643. Tincture Ipecac Compound—*Tincture Opium and Ipecac*—*Liquid Dover's*.—Fluid Extract of Ipecac 1 $\frac{1}{2}$ fl.ounce, Tincture of Opium sufficient to make 1 pint. Mix and filter. It may also be made with Deodorized Tincture of Opium, instead, using the same quantity. A fl.drachm is intended to represent 1 grain Dover's Powder.

3644. Tincture Lobelia Compound—*Antispasmodic Tincture*.—Lobelia, Sanguinaria, Skunk Cabbage, Wild Ginger, Pleurisy Root, each $\frac{3}{4}$ ounce. Alcohol 10 fl.ounces, Water 5 fl.ounces. Make a Tincture by maceration and percolation. Dose, 15 to 150 minims.

3645. Tincture Lobelia and Capsicum Compound—*Antispasmodic Tincture*—Amer. Disp.—Lobelia, Capsicum, Skunk Cabbage, each 1 ounce

av., diluted Alcohol sufficient to make 1 pint. Make a Tincture by maceration and percolation. Dose, 30 to 60 minims.

3646. Tincture Myrrh and Capsicum—Hot Drops—No. 6—Pain Killer.—Capsicum $\frac{1}{2}$ ounce, Myrrh 1 ounce, Alcohol 1 pint. Mix, macerate in a warm place for a week or longer, and filter. Other additions are sometimes made to this and it is quite generally sold as Pain Killer. The dose is $\frac{1}{4}$ to 1 fl.drachm in sweetened water. This is also made with $\frac{1}{4}$ ounce of Capsicum in a pint, instead of $\frac{1}{2}$ ounce, as above.

3647. Tincture Opium Compound, or Diarrhœa Mixture.—Tincture of Opium, Tincture of Capsicum, Spirit of Camphor, each 3 fl.ounces, purified Chloroform 540 minims, Alcohol sufficient to make 14 fl.ounces. Mix the Chloroform with the Alcohol and add the Tinctures. This is given for diarrhœa in doses of 20 to 60 minims.

3648. Tincture Opium Deodorized with Nitre.—This is prepared in the same manner as Deodorized Tincture of Opium, but instead of Alcohol Spirit of Nitrous Ether is used. It may also be made by evaporating Deodorized Tincture of Opium to half its volume and making up to the original volume with Spirit of Nitrous Ether. The strength and dose is the same as ordinary Tincture of Opium Deodorized.

3649. Tincture of Phosphorus Compound.—Phosphorus 4 grains, Absolute Alcohol $2\frac{1}{2}$ fl.ounces, Alcohol 1 ounce, Glycerin 2 fl.ounces, Peppermint Essence $\frac{1}{2}$ fl.ounce. Shave the Phosphorus and dissolve it in the Absolute Alcohol contained in well-stopped small bottle by the aid of heat of a water-bath. When dissolved add the Alcohol, then the Glycerin and the Essence of Peppermint. Ten minims of this Tincture contain $\frac{1}{4}$ grain of Phosphorus.

3650. Tincture Rhubarb Compound—Amer. Disp.—Rhubarb 1 ounce, Bitter Root, Hydrastis, Gentian, Prickly Ash Berries, each $\frac{1}{2}$ ounce, Sassafras, Cardamom, each $\frac{1}{4}$ ounce, diluted Alcohol sufficient to make 20 fl.ounces. Make a Tincture by maceration and percolation. Dose, 2 to 4 fl.drachms.

3651. Tincture of Strychnine, Magendie's.—Strychnine 3 grains, Alcohol 1 fl.ounce. Dissolve. Care must be used not to dispense this when other preparations of Strychnine are intended.

3652. Warburg's Tincture—(Americanized).—Take of Socotrine Aloes 120 grains, Confection Rose, E. I. Rhubarb, Angelica Seed, each 30 grains, Elecampane Root, Saffron, Fennel Seed, Prepared Chalk, each 15 grains, Gentian Root, Zedoary Root, Cubebs, Myrrh, Camphor, each 8 grains, Sulphate of Quinine 75 grains, diluted Alcohol enough to make 1 pint. Powder the drugs and percolate all except the Confection Rose, Prepared Chalk and Quinine, with the diluted Alcohol until 1 pint is obtained. Rub the Quinine to a fine powder and then with the Confection Rose, triturate this in a mortar with the percolate obtained, and dissolve the Quinine in the mixture by gentle heat; cool, add the prepared chalk, allow to stand 24 hours, and

filter. This has enjoyed a great reputation as a *Fever Tincture*, being given in doses of about 4 fl.drachms.

3653. Tincture White Pine.—White Pine Turpentine (gum) 2 ounces, Alcohol 14 fl.ounces. Cut the Turpentine into small pieces and dissolve it in the Alcohol by gentle heat of water-bath. This is used for making Syrup of White Pine and Syrup of White Pine Compound, used as cough remedies.

3654. Tincture Zedoary Compound.—Zedoary 4 ounces, Calamus, Galangal, each 2 ounces, Chamomile, Aniseed, Caraway, each 1 ounce, Bay Berries, Cloves, each $\frac{3}{4}$ ounce, Orange Peel, Mace, each $\frac{1}{2}$ ounce, Peppermint Water, Alcohol, each 24 fl.ounces. Macerate for two days, then percolate, adding diluted Alcohol sufficient to make 14 fl.ounces, and then add 4 ounces of Chloric Ether. This is employed as a warm carminative Tincture. Dose, 30 to 60 minims.

ETHERIAL TINCTURES.

3655. Tincture Asafetida Etherial.—Asafetida, in powder, 1 part, Alcohol, Ether, each equal quantities, by weight, sufficient to make 5 parts of Tincture. Macerate the gum-resin in the mixed Alcohol and Ether for seven days and then decant.

3656. Tincture Cantharides Etherial.—Cantharides, in powder, 1 part or ounce, Acetic Ether 10 parts or ounces by weight. Macerate for seven days and decant the clear portion. (See also 58.)

3657. Tincture Castor Etherial.—Castor, in powder, 1 part or ounce, Alcohol, Ether, each equal quantities, by weight, sufficient to make 10 parts or ounces of Tincture. Macerate and decant.

3658. Tincture Ergot Etherial.—Ergot, in coarse powder, 1 part or ounce, Ether 3 parts or ounces. Macerate for seven days, pour off, express, and filter.

3659. Tincture Iodine Etherial.—Iodine 80 grains, Ether 3 fl.ounces. Dissolve.

3660. Tincture Iodoform Etherial.—Iodoform 1 part, Ether 4 parts by weight.

3661. Tincture Lobelia Etherial.—Lobelia, in powder, 1 part, Spirit of Ether (2971) 8 parts by weight. Macerate seven days, decant, press, and filter. Dose, 5 to 30 minims.

3662. Tincture Nux Vomica Etherial.—Nux Vomica, in powder, 1 part, Spirit of Ether 10 parts by weight. Macerate seven days, decant, express and filter.

Other Etherial Tinctures will be found among the Official Tinctures and under other headings.

HOMŒOPATHIC TINCTURES.

The Tinctures of Homœopathic Pharmacy are mostly supplied by Homœopathic manufacturing pharmacists, but there is no reason why they should not be made by pharmacists the same as other Tinctures. As a great number are prepared from a great variety of substances it will be impracticable to give detailed formulas for each, but the general method and formulas for making the different classes and potencies are given. The original Tinctures are called *Mother Tinctures*; their dilutions or attenuations are called *Potencies*, and are known as first, second, third, etc., in the centesimal scale, or 1x, 2x, 3x, etc., in the decimal scale, as explained below.

3663.

Class I. Tinctures.

Tinctures prepared with equal parts, by weight, of the juice of the plant and Alcohol. The freshly-gathered plant or part which is used is chopped and pounded to a pulp, which is enclosed in a piece of new linen and subjected to pressure. The expressed juice is then mixed, with brisk agitation, with an equal weight of Alcohol, the mixture allowed to stand eight days in a well-stopped bottle in a dark, cool place and then filtered. The drug power of Tinctures thus prepared is $\frac{1}{2}$.

Potentiation — Centesimal Scale.—The 1st potency is prepared by mixing 2 minims of the Tincture with 98 minims of diluted Alcohol. The 2d potency is prepared by adding 1 minim of the 1st potency to 99 minims of Alcohol. Each succeeding higher potency is prepared in the same manner as the 2d by adding 1 minim of the next lower to 99 minims of Alcohol.

Decimal Scale.—The first or 1x potency is prepared by adding 2 minims of the Tincture to 8 minims of diluted Alcohol. The second or 2x potency is prepared by mixing 1 minim of the 1x potency with 9 minims of diluted Alcohol.

The 3d or 3x potency is prepared by adding 1 minim of the 2x potency to 9 minims of diluted Alcohol. The higher potencies are prepared in a like manner from the next lower.

3664.

Class II. Tinctures.

Tinctures expressed by the aid of 2 parts of Alcohol added to 3 parts of plant or the part of plant used.

The finely-chopped fresh plant or part which is used is weighed, and to every 3 parts 2 parts by weight, of Alcohol are taken. The chopped plant is moistened with sufficient Alcohol to make it into a thick mass or pulp when well stirred together. The remainder of the Alcohol is then added and the whole mixed together and strained through a piece of new linen. The Tinc-

ture thus obtained is allowed to stand eight days, then filtered. The drug power of Tinctures thus prepared is $\frac{1}{2}$.

Potentiation.—As the drug power of Tinctures thus prepared is the same as Class I., their potencies are prepared in exactly the same manner as directed for preparing them.

3665.

Class III. Tinctures.

Tinctures prepared with 2 parts, by weight, of Alcohol to 1 part of plant or part of plant used.

The fresh plant or part used is pounded to a fine pulp and weighed, then 2 parts, by weight, of Alcohol are taken; one sixth of it being first mixed with the pulp and then the remainder added, well stirred together and set aside in a cool, dark place for eight days. The Tincture is then decanted, strained and filtered.

The drug power of Tinctures thus prepared is $\frac{1}{6}$.

Potentiation — *Centesimal Scale.*—The 1st potency is prepared by mixing 6 minims of the Tincture with 94 minims of diluted Alcohol. The 2d potency is prepared by adding 1 minim of the 1st potency to 99 minims of Alcohol. Each successive higher potency is prepared in the same manner as the 2d, by adding 1 minim of the next lower to 99 minims of Alcohol.

Decimal Scale.—The first or 1x potency is prepared by adding 6 minims of the Tincture to 4 minims of diluted Alcohol. The second or 2x potency is prepared by adding 1 minim of the 1x potency to 9 minims of diluted Alcohol. The 3d or 3x potency is prepared by adding 1 minim of the 2x potency to 9 minims of diluted Alcohol. The higher potencies are prepared in a like manner from the next lower.

3666.

Class IV. Tinctures.

Tinctures prepared with 5 parts, by weight, of Alcohol to 1 part of the dried and finely powdered substance, or fresh animal substances.

Weigh the substance and pour over it 5 parts, by weight, of Alcohol and let the mixture remain eight days or longer, at ordinary temperature, in a dark place, shaking it twice a day, then pour off, strain, and filter. (Fresh animal substances are pounded.)

The drug power of Tinctures thus prepared is $\frac{1}{10}$.

Potentiation — *Centesimal Scale.*—The 1st potency is prepared by adding 10 minims of the Tincture to 90 minims of Alcohol. The 2d potency is prepared by adding 1 minim of the 1st potency to 99 minims of Alcohol. Each successive higher potency is prepared in the same manner as the 2d, by adding 1 minim of the next lower to 99 minims of Alcohol.

Decimal Scale.—As the Tincture contains $\frac{1}{10}$ drug power, it corresponds to the first or 1x potency. The 2d or 2x potency is prepared by adding 1 minim of the 1x potency to 9 minims of Alcohol. The higher potencies are prepared in the same manner from the next lower.

HOMŒOPATHIC SOLUTIONS.

Although these are not properly classified under Tinctures, they most conveniently come in this connection and are therefore given here.

3667. Class V.—*a*. Aqueous Solutions.

One part, by weight, of the medicinal substance dissolved in 9 parts, by weight, of distilled Water.

Amount of drug power of Solution, $\frac{1}{10}$.

Potentiation—*Centesimal Scale*.—The 1st potency is made by adding 10 minims of the Solution to 90 minims of distilled Water. The 2d potency is prepared by adding 1 minim of the 1st potency to 99 minims of Alcohol. The higher potencies are prepared in a like manner from the next lower.

Decimal Scale.—The original Solution contains $\frac{1}{10}$ drug power and is, therefore, the first or 1x potency. The second or 2x potency is prepared by adding 1 minim of the Solution to 9 minims of distilled Water. The third or 3x potency is prepared by adding 1 minim of the 2x potency to 9 minims of diluted Alcohol. Higher potencies are prepared from the next lower in the same manner by adding 1 minim to 9 minims of Alcohol.

3668. Class V.—*β*. Aqueous Solutions.

One part, by weight, of the medicinal substance is dissolved in 99 parts, by weight, of distilled Water.

The amount of drug power of the Solution is $\frac{1}{100}$.

Potentiation—*Centesimal Scale*.—As the drug power of the Solution is $\frac{1}{100}$ it corresponds to the 1st potency. The 2d potency is prepared by adding 1 minim of the original Solution to 99 minims diluted Alcohol. The higher potencies are prepared from the next lower by adding 1 minim to 99 minims of Alcohol.

Decimal Scale.—As the Solution contains $\frac{1}{100}$ drug power it corresponds to the second or 2x potency. The third or 3x potency is prepared by adding 1 minim of the Solution to 9 minims of dilute Alcohol. The fourth or 4x potency is prepared by adding 1 minim of the 3x potency to 9 minims of Alcohol. Higher potencies are prepared in a like manner from the next lower.

3669. Class VI.—*a*. Alcoholic Solutions.

One part, by weight, of the medicinal substance is dissolved in 9 parts, by weight, of Alcohol.

The amount of drug power of the Solution is $\frac{1}{10}$.

Potentiation.—The potencies are prepared in the same manner as those of the Aqueous Solutions, *a*, using Alcohol as the diluent.

3670. Class VI.— β . Alcoholic Solutions.

One part, by weight, of the medicinal substance is dissolved in 99 parts, by weight, of Alcohol.

Potentiation.—The potencies are prepared in the same manner as those of the Aqueous Solutions, β , using Alcohol as the diluent.

For the remaining classes of Homœopathic preparations, see Triturations.

TISANES.

In French Pharmacy, Tisanes are slightly medicated infusions of some aromatic substance combined with barley, rice, or tamarind water, or other mucilaginous vehicle, the dose being a wineglassful or more every half hour until the medicinal effect is obtained. They are not used to any extent in this country.

TRITURATIONES—TRITURATIONS.

Triturations are a class of preparations newly introduced into the Pharmacopœia, which consist of some active medicinal agent, reduced by rubbing intimately in a mortar with nine times its weight of Sugar of Milk or some other inert diluent. But one formula, besides the general formula, for making them is given; any substance, however, may be made up in the form of a trituration if desired, and, indeed, this is a very good way to exhibit medicines of which a very small dose only is required, as the medicinal agent is finely divided and the dose can be properly regulated. The following is the U. S. P. 1880:

3671. General Formula for Triturations.

The Substance, 10 parts.

Sugar of Milk, in moderately fine powder, 90 parts.

To make 100 parts.

Weigh the Substance and Sugar of Milk separately, then place the Substance, previously reduced, if necessary, to a moderately fine powder, in a mortar, add about an equal bulk

of Sugar of Milk, mix well by means of a spatula and triturate them thoroughly together. Add fresh portions of the Sugar of Milk, from time to time, until the whole is added, and continue the trituration until the substance is intimately mixed with the Sugar of Milk and finely comminuted.

3672. Trituratio Elaterini.

Trituration of Elaterin.

Elaterin, 10 parts or grains.

Sugar of Milk, in moderately fine

powder, 90 parts or grains.

To make 100 parts or grains.

Mix them thoroughly by trituration.

This serves as a sample formula, the only one that is given as official in the U. S. P. Others may be made in the same manner.

HOMŒOPATHIC TRITURATIONS.

In Homœopathic Pharmacy Triturations are extensively used, but their strength does not at all correspond with those of Regular Pharmacy. Aside from the particular directions for manipulating, which amount only to insure that the substances shall be thoroughly triturated together, the directions for making are as follows:

Triturations on the Centesimal Scale.

This scale was introduced by Hahnemann and is still employed for making the higher potencies, the lower being generally made by the Decimal Scale.

3673. Class VII.—Trituration of Dry Medicinal Substances.

First Trituration.—Take 1 grain of the medicinal substance and 99 grains or parts of Sugar of Milk, add the medicinal substance to about one third of the Sugar of Milk in an unglazed porcelain mortar and triturate them thoroughly together for six minutes, then scrape the Trituration from the sides to the centre of the mortar with a porcelain spatula and stir it thoroughly with the same for four minutes, and again triturate for six minutes as before. To this powder again scraped up for four minutes, now add the second third of the quantity of Sugar of Milk, triturate and scrape up as before twice successively, then add the remainder of the Sugar of Milk and combine

it with the powder in the mortar by trituration and scraping up as previously directed.

This is the first or standard Trituration, containing 1 per cent. of the medicinal substance. It is also known as the *First Centesimal Trituration*.

Second Trituration.—Take 1 grain or part of the first Trituration and 99 grains or parts of Sugar of Milk and prepare by triturating portions of the Sugar of Milk successively, added with the first Trituration in the same manner as directed for making the first Trituration. This contains 1 part of the medicinal substance in 10,000, and is called the *Second Centesimal Trituration*.

Third Trituration.—Take 1 grain or part of the *second* Trituration and 99 grains or parts of Sugar of Milk and prepare a Trituration in the same manner as previously directed. This contains 1 part of the medicinal substance in 1,000,000 parts of the Trituration and is called the *Third Centesimal Trituration*.

Liquid Potencies.—The third Trituration may be converted into Liquid Potencies by dissolving in Alcohol and Water, in the following manner: One grain or part of the Third Centesimal Trituration is added to 50 minims or parts of distilled Water and agitated, then, when dissolved, 50 minims or parts of Alcohol are added, and the stoppered vial, only two thirds full, is shaken ten times. This is the *Fourth Potency*.

One minim of this liquid (the Fourth Potency) is added to 99 minims of Alcohol and the vial shaken ten times to make the *Fifth Potency*, and so on, the theory being that the higher the potency used the more effective the medicine. Attenuations above the thirteenth are termed *High Potencies*.

Triturations on the Decimal Scale.

This scale was introduced by Dr. Hering, and is used for the lower potencies.

First Decimal Trituration.—Take 10 parts or grains of the medicinal substance and 90 parts or grains of Sugar of Milk, and prepare a Trituration in the same manner as is directed for making the Centesimal Trituration.

The Second Decimal Trituration is prepared by taking 10 parts of the *first* with 90 parts of Sugar of Milk.

The Third, by taking 10 parts of the *second* with 90 parts of Sugar of milk, etc., each higher Trituration representing 10 parts of the next below it.

Liquid Potencies.—The Sixth Decimal (6x) Trituration is converted into Liquid Potencies by adding 1 grain or part to 50 minims or parts of distilled Water, then, when dissolved, adding 50 minims or parts of Alcohol. This is called the Eighth Potency (8x). One drop of this with 9 of diluted Alcohol gives the Ninth Potency (9x). Higher potencies in this scale are made in the same manner by adding 1 drop of the next lower to 9 of diluted Alcohol. Do not forget that the mixture must be shaken ten times by ten powerful downward strokes of the arm.

3674. Class VIII.—Trituration of Liquid Substances.

These are prepared according to the *Centesimal Scale* by triturating 1 minim or part of the liquid with 99 grains or parts of Sugar of Milk for the *first*, 1 part of the first with 99 of Sugar of Milk for the *second*, and so on.

By the *Decimal Scale* 1 part of the liquid is triturated with 9 parts of Sugar of Milk for the *first*, 1 part of the first with 9 parts of Sugar of Milk for the *second*, and so on.

These are converted into Liquid Potencies in the same manner as has already been described.

3675. Class IX.—Trituration of Fresh Vegetable and Animal Substances.

Fresh vegetable or animal substances are first pounded or grated to a fine pulp, then triturated and potentized as directed in the foregoing classes.

To make the 1st Trituration of the *Centesimal Scale* 2 parts, by weight, of the substance are triturated with 99 parts, by weight of Sugar of Milk. (Two parts are taken because of loss of weight of the fresh substance by exposure during the trituration.)

The 2d Trituration is made with 1 part of the first and 99 parts of Sugar of Milk, as heretofore described.

These are converted into *Liquid Potencies* as before described.

Medicated Globules or Pellets.

These are prepared by saturating the pellets, globules, or discs with alcoholic solution of whatever potency may be desired, then draining off the superfluous fluid and allowing to dry. These globules or pellets are of different sizes, and are known as No. 8, 10, 15, 20, 25, 30, 40, 50, 60, 70, and 80, according to their size — No. 8 being the smallest, and No. 80 being the largest; the most commonly used being from No. 20 to No. 40.

TROCHISCI—TROCHES.

Troches or Lozenges are flat or slightly convex bodies, made up in various shapes, usually containing some medicinal agent mixed with sugar and gum or other adhesive substance and intended to dissolve slowly in the mouth and by their solution apply the medicinal agent to the internal surface of the throat and surrounding organs.

Like sugar-coated pills, they are now seldom prepared by druggists, manufacturers having mostly monopolized the busi-

ness and driven the officinal Troches out of use, by introducing more elegant or convenient preparation.

Many of the medicinal agents that are introduced in the form of Troches in the Pharmacopœia formulæ seem inappropriate to be exhibited in this form. It would seem natural that only such remedies should be used in Troches as, by their slow solution, would act locally upon the mucous membrane of the parts with which they come in contact — the throat, larynx, etc.

To make Troches, a board about 5×10 inches, with a rim projecting above its surface about $\frac{1}{8}$ of an inch, and a cylindrical rolling-pin, should be provided. The ingredients are then to be mixed into a stiff mass or dough, the board dusted with a mixture of powdered sugar and starch, and the mass rolled out between the projecting lateral edges of the board, filling it entirely from the end out, as far as it will. It is then to be divided with a knife or spatula into the required number of Troches, and dried by gentle heat. Lozenge cutters that make about 12-grains Troches may be obtained of jobbers or dealers in pharmaceutical apparatus, but they cut only a definite size, not adapting themselves to the specific quantity of the medicinal agent directed in the formula.

The following formula for Troches represent those now official in the leading pharmacopœias. Others can be made as desired in the same general manner. The solid ingredients to be incorporated are all to be in fine powder. Many of them are called Tablets by manufacturers:

3676.

Trochisci Acidi Benzoici.*Benzoic Acid Lozenges.*

Benzoic Acid,	360 grains.
Refined Sugar, in powder,	25 ounces av.
Gum Acacia, in powder,	1 ounce av.
Mucilage of Gum Acacia,	2 fl.ounces.
Distilled Water, a sufficiency.	

Mix the Benzoic Acid, Sugar and Gum, add the Mucilage and Water to form a proper mass. Divide into 720 Lozenges and dry in a hot-air chamber at a moderate temperature.

Each Lozenge contains half a grain of Benzoic Acid. Br.

3677. Trochisci Acidi Tannici.*Troches of Tannic Acid.*

Tannic Acid, 100 grains or 6.50 grammes.
 Sugar, in fine powder, 1000 grains or 65.00 grammes.
 Tragacanth, in fine powder, 25 grains or 1.60 grammes.
 Orange Flower Water, sufficient to make 100 troches.

Rub the powders together until they are thoroughly mixed, then, with Orange Flower Water, form a mass, to be divided into 100 Troches. U. S.
 The Br. P. makes these only $\frac{1}{2}$ grain Tannin in each.

3678. Trochisci Ammonii Chloridi.*Troches of Chloride of Ammonium.*

Chloride of Ammonium, in fine powder, 200 grains or 13.00 grammes.
 Sugar, in fine powder, 1000 grains or 65.00 grammes.
 Tragacanth, in fine powder, 25 grains or 1.60 grammes.
 Syrup of Tolu, sufficient to make 100 troches.

Rub the powders together until they are thoroughly mixed, then, with Syrup of Tolu, form a mass, to be divided into 100 Troches. U. S.

3679. Trochisci Bismuthi.*Bismuth Lozenges.*

Subnitrate of Bismuth, 1440 grains.
 Carbonate of Magnesium, 4 ounces av.
 Precipitated Carbonate of Calcium, 6 ounces av.
 Refined Sugar, 29 ounces av.
 Gum Acacia, in powder, 1 ounce av.
 Mucilage of Gum Acacia, 2 fl.ounces.
 Rose Water, a sufficiency.

Mix the dry ingredients, then add the Mucilage and form the whole into a proper mass with Rose Water. Divide the mass into 720 Lozenges and dry these in a hot-air chamber at a moderate temperature.

Each Lozenge contains 2 grains Subnitrate of Bismuth. Br.

3680. Trochisci Catechu.*Troches of Catechu.*

Catechu, in fine powder, 100 grains or 6.50 grammes.
 Sugar, in fine powder, 1000 grains or 65.00 grammes.
 Tragacanth, in fine powder, 25 grains or 1.60 grammes.
 Orange Flower Water, sufficient to make 100 troches.

Rub the powders together until they are thoroughly mixed, then, with Orange Flower Water, form a mass, to be divided into 100 Troches.

The Br. P. directs the same quantity of Catechu.

3681.

Trochisci Cretæ.*Troches of Chalk.*

Prepared Chalk,	400 grains or 26.00 grammes.
Acacia, in fine powder,	100 grains or 6.50 grammes.
Nutmeg, in fine powder,	15 grains or 1.00 gramme.
Sugar, in fine powder,	600 grains or 39.00 grammes.

Rub them together until they are thoroughly mixed, then with Water, form a mass, to be divided into 100 Troches. U. S.

3682.

Trochisci Cubebæ.*Troches of Cubeb.*

Oleoresin of Cubeb,	50 grains or 3.25 grammes.
Oil of Sassafras,	15 grains or 1.00 gramme.
Extract of Liquorice, in fine powder,	400 grains or 26.00 grammes.
Acacia, in fine powder,	200 grains or 13.00 grammes.
Syrup of Tolu, sufficient to make 100 Troches.	

Rub the powders together until they are thoroughly mixed, then add the Oleoresin and Oil and incorporate them with the mixture. Lastly, with Syrup of Tolu, form a mass, to be divided into 100 Troches. U. S.

3683.

Trochisci Ferri.*Troches of Iron.*

Hydrated Oxide of Iron, dried at a temperature not exceeding 80° C. (176° F.),		500 grains or 32.50 grammes.
Vanilla, cut in slices,	10 grains or 0.65 gramme.	
Sugar, in fine powder,	1500 grains or 97.50 grammes.	
Mucilage of Tragacanth, sufficient to make 100 troches.		

Rub the Vanilla first with a portion of the Sugar to a uniform powder, and afterward with the Oxide of Iron and the remainder of the Sugar until they are thoroughly mixed; then, with Mucilage of Tragacanth, form a mass, to be divided into 100 Troches. U. S.

This differs from the U. S. 1870 formula for Troches of Subcarbonate of Iron by the substitution of the Hydrated Oxide of Iron in place of the Subcarbonate.

3684.

Trochisci Ferri Redacti.*Reduced Iron Lozenges.*

Reduced Iron,	720 grains.
Refined Sugar, in powder,	25 ounces av.

Gum Acacia, in powder,	1 ounce av.
Mucilage of Gum Acacia,	2 fl.ounces.
Distilled Water, 1 ounce or a sufficiency.	

Mix the Iron, Sugar, and Gum and add the Mucilage and Water to form a proper mass. Divide into 720 Lozenges and dry them in a hot-air chamber at a moderate temperature.

Each Lozenge contains 1 grain of Reduced Iron. Br.

3685. Trochisci Glycyrrhizæ et Opii.

Troches of Liquorice and Opium.

Extract of Liquorice, in fine powder,	200 grains or 13.00 grammes.
Extract of Opium,	5 grains or 0.32 gramme.
Acacia, in fine powder,	200 grains or 13.00 grammes.
Sugar, in fine powder,	300 grains or 19.50 grammes.
Oil of Anise,	3 grains or 0.20 gramme.

Rub the powders together until they are thoroughly mixed, then add the Oil of Anise and incorporate it with the mixture. Lastly, with Water, form a mass, to be divided into 100 Troches. U. S.

3686. Trochisci Ipecacuanhæ.

Troches of Ipecac.

Ipecac, in fine powder,	25 grains or 1.60 grammes.
Tragacanth, in fine powder,	25 grains or 1.60 grammes.
Sugar, in fine powder,	1000 grains or 65.00 grammes.
Syrup of Orange, sufficient to make 100 troches.	

Rub the powders together until they are thoroughly mixed, then, with Syrup of Orange, form a mass, to be divided into 100 Troches. U. S.

The 1870 formula directed about 25 per cent. of Arrow Root; its place is supplied in the present formula with Sugar.

The Br. P. directs the same quantity of Ipecac in each.

3687. Trochisci Kramerizæ.

Troches of Krameria (Rhatany).

Extract of Krameria,	100 grains or 6.50 grammes.
Sugar, in fine powder,	1000 grains or 65.00 grammes.
Tragacanth, in fine powder,	25 grains or 1.60 grammes.
Orange Flower Water, sufficient to make 100 troches.	

Rub the powders together until they are thoroughly mixed, then, with Orange Flower Water, form a mass, to be divided into 100 Troches. U. S.

3688.

Trochisci Magnesiae.*Troches of Magnesia.*

Magnesia,	300 grains or 19.50 grammes.
Nutmeg, in fine powder,	15 grains or 1.00 gramme.
Sugar, in fine powder,	900 grains or 15.50 grammes.
Mucilage of Tragacanth, sufficient to make 100 troches.	

Rub the Magnesia and the powders together until they are thoroughly mixed, then, with Mucilage of Tragacanth, form a mass, to be divided into 100 Troches. U. S.

3689.

Trochisci Menthae Piperitæ.*Troches of Peppermint.*

Oil of Peppermint,	15 grains or 1.00 gramme.
Sugar, in fine powder,	1200 grains or 78.00 grammes.
Mucilage of Tragacanth, sufficient to make 100 troches.	

Rub the Oil of Peppermint and Sugar together until they are thoroughly mixed, then, with Mucilage of Tragacanth, form a mass, to be divided into 100 Troches. U. S.

3690.

Trochisci Morphinae.*Morphine Lozenges.*

Hydrochlorate of Morphine,	20 grains.
Tincture of Tolu,	$\frac{1}{2}$ fl.ounce.
Refined Sugar, in powder,	24 ounces av.
Gum Acacia, in powder,	1 $\frac{1}{2}$ ounce av.
Mucilage of Gum Acacia, a sufficiency.	
Distilled Water,	$\frac{1}{2}$ fl.ounce.

Dissolve the Morphine in the Water, add this solution to the Tincture of Tolu, previously mixed with 2 fl.ounces of the Mucilage, then add the Gum and Sugar, previously mixed, and more Mucilage, if necessary, to form a proper mass. Divide into 720 Lozenges and dry these in a hot-air chamber at a moderate temperature.

Each Lozenge contains $\frac{1}{32}$ grain of the Morphine salt. Br.

3691.

Trochisci Morphinae et Ipecacuanhae.*Troches of Morphine and Ipecac.*

Sulphate of Morphine,	2 $\frac{1}{2}$ grains or 0.16 gramme.
Ipecac, in fine powder,	8 grains or 0.15 gramme.
Sugar, in fine powder,	1000 grains or 65.00 grammes.
Oil of Gaultheria,	1 grain or 0.07 gramme.
Mucilage of Tragacanth, sufficient to make 100 troches.	

Rub the powders together until they are thoroughly mixed, then add the Oil of Gaultheria and incorporate it with the mixture. Lastly, with Mucilage of Tragacanth, form a mass, to be divided into 100 Troches. U. S.

The Br. formula is about the same.

3692.

Trochisci Opii.*Opium Lozenges.*

Extract of Opium,	72	grains.
Tincture of Tolu,	$\frac{1}{2}$	fl.ounce.
Refined Sugar, in powder,	16	ounces av.
Gum Acacia, in powder,	2	ounces av.
Extract of Liquorice,	6	ounces av.
Distilled Water, a sufficiency.		

Make a mass, to be divided into 720 Lozenges. Each Lozenge contains $\frac{1}{10}$ grain Extract of Opium, equal to $\frac{1}{30}$ grain of Morphine.

3693.

Trochisci Potassii Chloratis.*Troches of Chlorate of Potassium.*

Chlorate of Potassium, in fine powder,	500 grains or	32.50 grammes.
Sugar in fine powder,	1900 grains or	124.00 grammes.
Tragacanth, in fine powder,	120 grains or	6.50 grammes.
Spirit of Lemon,	10 grains or	0.65 gramme.
To make 100 troches.		

Mix the Sugar with the Tragacanth and the Spirit of Lemon by trituration in a mortar, then transfer the mixture to a sheet of paper and, by means of a bone spatula, mix with it the Chlorate of Potassium, being careful to avoid trituration and pressure to prevent the mixture from igniting or exploding. Lastly, with Water, form a mass, to be divided into 100 Troches. U. S.

The Br. P. directs the same quantity of Chlorate of Potassium.

3694.

Trochisci Santonini.*Santonin Lozenges.*

Santonin, in powder,	720	grains.
Refined Sugar, in powder,	25	ounces av.
Gum Acacia, in powder,	1	ounce av.
Mucilage of Gum Acacia,	2	fl.ounces.
Distilled Water, a sufficiency.		

Mix the Santonin, Sugar, and Gum, add the Mucilage and Water to form a proper mass. Divide into 720 Lozenges and dry these in a hot air chamber at a moderate temperature.

Each Lozenge contains 1 grain of Santonin. Br.

The G. P. directs only 0.025 gramme of Santonin in each.

3695. Trochisci Sodii Bicarbonatis.*Troches of Bicarbonate of Sodium.*

Bicarbonate of Sodium, 300 grains or 19.50 grammes.
 Sugar, in fine powder, 900 grains or 58.50 grammes.
 Nutmeg, in fine powder, 15 grains or 1.00 gramme.
 Mucilage of Tragacanth, sufficient to make 100 troches.

Rub the Bicarbonate of Sodium with the powders until they are thoroughly mixed, then, with Mucilage of Tragacanth, form a mass, to be divided into 100 Troches. U. S.

The Br. P. directs 5 grains of Carbonate of Sodium in each.

3696. Trochisci Sodii Santoninatis.*Troches of Santoninate of Sodium.*

Santoninate of Sodium, in fine
 powder, 100 grains or 6.50 grammes.
 Sugar, in fine powder, 2000 grains or 130.00 grammes.
 Tragacanth, in fine powder, 50 grains or 3.25 grammes.
 Orange Flower Water, sufficient to make 100 troches.

Rub the powders together until they are thoroughly mixed, then, with Orange Flower Water, form a mass, to be divided into 100 Troches. U. S.

These Troches are evidently designed to take the place of the Troches of Santonine that were official in the 1870 revision, but it is much to be questioned if Santoniate of Sodium is so effective or safe as the Alkaloid for a vermifuge.

3697. Trochisci Zingiberis.*Troches of Ginger.*

Tincture of Ginger, 200 grains or 13.00 grammes.
 Tragacanth, in fine powder, 50 grains or 3.25 grammes.
 Sugar, in fine powder, 2000 grains or 130.00 grammes.
 Syrup of Ginger, sufficient to make 100 troches.

Mix the Tincture of Ginger with the Sugar and, having exposed the mixture to the air until dry, reduce it to a fine powder; to this add the Tragacanth and mix thoroughly. Lastly, with Syrup of Ginger, form a mass, to be divided into 100 Troches. U. S.

A great variety of other Troches or Lozenges may be made in the same general manner as the foregoing. Manufacturers quote long lists of Troches, Lozenges, or Tablets, which are usually compressed, as previously described. Formulas for any desired combination may readily be made by taking the required amount of the medicinal agents to make 100 Troches, and adding Sugar, Gum, Mucilage, etc., sufficient to make 100 Troches of the required size.

TUNGSTEN OR WOLFRAMIUM.

Symbol, Ti or W.; Atomic weight, 48.

This is an elementary metal discovered by Delhuyart in a heavy metal, found chiefly in Sweden, and called *Wolfram*. It is a heavy, gray, brittle metal, and may be obtained by reducing Tungstic Acid with charcoal at a white heat.

With Oxygen it forms two Oxides, TiO_2 (Dioxide), and TiO_3 (Trioxide), which unite with the elements of water, forming corresponding acids. It also unites with Chlorine and some elements. *Tungstic Acid*, H_2TiO_4 , combines with Sodium and other alkali bases, forming salts known as Tungstates.

3698. Tungstate of Sodium — Na_2TiO_4 .— This is used for rendering linen and other fabrics unflammable by dipping them in a 20 per cent. solution of the salt or painting them with the solution. It is useful for theatrical scenery, etc. It may be prepared by adding 9 parts of finely-powdered Tungsten to 8 parts of fused Carbonate of Sodium and heating them together for some time, then cooling, powdering, and boiling the powder with Water, filtering, and evaporating to dryness.

3699. Tungstic Glue.— This is a compound similar to hard rubber, and used as a substitute for it for many purposes. It is prepared by mixing together a thick solution of Glue with Tungstate of Sodium and adding Hydrochloric Acid. A compound of Tungstic Acid and Glue is precipitated, which, at a temperature of 100 to 104, becomes sufficiently elastic to be moulded or drawn into thin sheets, but is quite solid at ordinary temperature.

UNGUENTA—OINTMENTS.

Ointments are fatty preparations of a solid or semi-solid consistence, intended for external application, and usually containing some medicinal substance which is designed to be absorbed or exert its action on the parts to which it is applied.

The difference between Ointments and Cerates consists chiefly in their consistence—the Ointments as a class being softer than the Cerates—and being intended, generally, for rubbing in, while the Cerates are usually spread and applied like a plaster.

The British Pharmacopœia has done away with this classification, and now includes all Cerates among the Ointments.

As has been previously remarked of Cerates, it seems strange that no attempt was made by the revisers of the 1880 Pharmacopœia to introduce Petrolatum as a base for Ointments in the place of Lard; for experience has shown its great superiority over it as an Ointment base, and it is now being generally used by pharmacists. It is quite generally directed in the 1885 Br. P. for making Ointments, under the name of Soft Paraffin.

White and amber or yellow Petrolatum are now furnished by manufacturers, and it is advisable that druggists should use, in making their Ointments, the color that will best correspond with the color of the Ointments as they have been formerly made—for instance, simple Ointment that has been made with lard and yellow wax, and dark colored Ointments generally, may be made with yellow Petrolatum, while those that have been made with Lard or Benzoinated Lard, if they are white or light colored when finished, should be made with white Petrolatum.

Lanoleum or Wool-fat is also recommended and used as an Ointment base, it being more readily absorbed than any other known solid fatty matter.

The following are the Ointments official in the leading pharmacopœias, and also the same made, when practicable, with Petrolatum as a base:

3700.

Unguentum.

Ointment — Simple Ointment.

Lard, 8 parts or 8 ounces.

Yellow Wax, 2 parts or 2 ounces.

Melt the Wax and add the Lard gradually, then stir the mixture constantly until cool. U. S. 1880.

The Br. P., under the title *Unguentum Simplex*, directs White Wax 2 ounces or 2 parts, Benzoinated Lard 3 ounces or 3 parts, Almond Oil 3 fl.ounces or 3 fl.parts. Melt the Wax and Lard in the Oil on a water-bath, then remove the mixture and stir constantly while it cools. This has the advantage of keeping much better than the U. S. Ointment.

3701. Unguentum or Petrolatum Ointment.

MADE WITH PETROLATUM.

Petrolatum, 8 ounces.
Yellow Wax or Paraffin Wax, 2 ounces.

Melt the Wax and Petrolatum together with gentle heat and stir while cooling. This is now being quite generally used as an Ointment base instead of the official preparation; it may be used with advantage whenever Ointment is directed or prescribed. It will not become rancid, and is readily incorporated with any substance with which the officinal Ointment is usually used.

Ointment or Simple Ointment is the basis of most of the other Ointments. It is very similar to Cerate or Simple Cerate, but contains a less proportion of Wax and is softer, being intended to be absorbed. It is seldom used except in combination.

3702. Unguentum Acidi Borici. Br.

Ointment of Boric Acid.

Boric Acid, in fine powder, . . 2½ ounces or 1 part.
Soft Paraffin (Petrolatum), . . 10 ounces or 4 parts.
Hard Paraffin (Paraffin Wax), . 5 ounces or 2 parts.

Mix the Hard and Soft Paraffin together and add the Boric Acid, distributed over the surface of the liquid by passing it through a sieve, then stir them together constantly until cold.

3703. Unguentum Acidi Carbolici.

Ointment of Carbolic Acid—Carbolic Ointment.

Carbolic Acid, 1 part or 1 ounce.
Ointment, 9 parts or 9 ounces.

Mix them thoroughly. This contains 10 per cent. of the Acid.

This Ointment is much stronger than manufacturers have been in the habit of furnishing as Carbolyzed Vaseline, Carbolyzed Cosmoline, etc. They are usually made to contain 3 instead of 10 per cent. of Carbolic Acid.

The Br. formula is Carbolic Acid 1 part, Soft Paraffin (Petrolatum) 12 parts, Hard Paraffin (Paraffin Wax) 6 parts. Melt them and stir constantly until cold. This is more like a Cerate as considered in U. S. Pharmacy than an Ointment. It contains about 5 per cent. of the Acid.

Carbolic Salve is a popular proprietary preparation. The Carbolic Salves usually contain a larger proportion of Wax than is directed in the foregoing formula.

3704. Unguentum Acidi Gallici.

Ointment of Gallic Acid.

Gallic Acid, 10 parts or 1 ounce.

Benzoinated Lard, 90 parts or 9 ounces.

Rub the Gallic Acid with the Benzoinated Lard gradually added until they are thoroughly mixed, avoiding the use of an iron spatula.

MADE WITH PETROLATUM.

Gallic Acid, 1 ounce.

Benzoinated Petrolatum, 9 ounces.

Rub them together until they are intimately mixed.

3705. Unguentum Acidi Salicylici. Br.

Ointment of Salicylic Acid.

Salicylic Acid, 1 part.

Soft Paraffin (Petrolatum), 18 parts.

Hard Paraffin (Paraffin Wax), 9 parts.

Melt the Hard and Soft Paraffins together, add the Salicylic Acid and stir until cold.

3706. Unguentum Acidi Tannici.

Ointment of Tannic Acid.

Tannic Acid, 10 parts or 51 grains.

Benzoinated Lard, 90 parts or 459 grains.

Rub the Tannic Acid with the Benzoinated Lard, gradually added, until they are thoroughly mixed, avoiding the use of an iron spatula.

MADE WITH PETROLATUM.

Tannic Acid, 1 ounce.
Benzoinated Petrolatum, 9 ounces.

Rub them together until they are thoroughly mixed.

3707. Unguentum Aconitinæ. Br.

Ointment of Aconitine.

This preparation is officinal in the British, but not in the U. S. Pharmacopœia. The following formula corresponds to the British except that Benzoinated Petrolatum is used instead of Prepared Lard.

Aconitine (Aconitia), 8 grains.
Alcohol, 30 minims.
Benzoinated Petrolatum, 1 ounce av.

Dissolve the Aconitine in the Alcohol and mix the solution thoroughly with the Benzoinated Petrolatum.

3708. Unguentum Antimonii Tartarati. Br.

Ointment of Tartrated Antimony — Tartar Emetic Ointment.

Tartrated Antimony, in very
fine powder, 100 grains or 1 part.
Simple Ointment, 400 grains or 4 parts.

Mix thoroughly.

The G. P. *Unguentum Tartari Stibiati* is the same.

3709. Unguentum Aquæ Rosæ.

Ointment of Rose Water — Cold Cream.

Expressed Oil of Almond, . . 50 parts or 5 ounces av.
Spermaceti, 10 parts or 1 ounce av.
White Wax, 10 parts or 1 ounce av.
Rose Water, 30 parts or 3 ounces av.

Melt together at a moderate heat the Oil, Spermaceti, and Wax, then gradually add the Rose Water, stirring the mixture briskly and constantly until it is cool, and continue the stirring until it has become uniformly soft and creamy. U. S. 1880.

The G. P. formula for *Unguentum Leniens* is nearly the same. All druggists who have made Cold Cream know how soon it becomes rancid when exposed.

If made with Petrolatum it will remain without change, and a much finer, smoother preparation will result. White Petrolatum should be used for this purpose, but, with the exception of color, the amber Petrolatum will do as well.

MADE WITH PETROLATUM.

White Petrolatum,	6 ounces av.
White Wax,	1 ounce av.
Rose Water,	2½ fl.ounces.
Oil of Rose,	2 minims.

Melt the Petrolatum and Wax together by gentle heat, and, when the mixture begins to solidify, gradually incorporate the Rose Water and Oil of Rose with it, by beating briskly until it is cool.

3710. *Unguentum Atropinæ.*

Ointment of Atropine.

This preparation is officinal in the British, but not in the U. S. Pharmacopœia. The following formula corresponds to the British except that Benzoinated Petrolatum is used instead of Prepared Lard.

Atropia (Atropine),	8 grains or 1 part.
Alcohol,	30 minims or 3½ fl.parts.
Benzoinated Petrolatum,	1 ounce or 55 parts.

Dissolve the Atropine in the Alcohol and mix the solution thoroughly with the Benzoinated Petrolatum.

3711. *Unguentum Belladonnæ.*

Ointment of Belladonna.

Alcoholic Extract Belladonna, 10 parts or	51 grains.
Diluted Alcohol,	6 parts or 30 minims.
Benzoinated Lard,	84 parts or 428 grains.

Rub the Extract with the diluted Alcohol until uniformly soft, then gradually add the Lard and mix thoroughly. U. S. 1880.

MADE WITH PETROLATUM.

Alcoholic Extract of Belladonna, . . . 1 ounce av.
 Diluted Alcohol, $\frac{1}{2}$ fl.ounce.
 Benzoinated Petrolatum, $8\frac{1}{2}$ ounces av.

Rub the Extract with the diluted Alcohol in a warm mortar until uniformly soft and gradually incorporate with it the Petrolatum by rubbing them together.

The Br. P. formula is Alcoholic Extract of Belladonna 1 part, Benzoated Lard 9 parts. Mix them thoroughly.

3712. Unguentum Benzoini.

Ointment of Benzoin, U. S. 1870 — Benzoinated Lard, U. S. 1880.

Benzoin, in coarse powder, 2 parts or 140 grains.
 Prepared Lard, 100 parts or 16 ounces av.

Melt the Prepared Lard by means of a water-bath and, having loosely tied the Benzoin (in coarse powder) in a piece of coarse muslin, suspend it in the melted Lard, and, stirring them together frequently, continue the heat for two hours, covering the vessel and not allowing the temperature to rise above 60° C. (140° F.). Lastly, having removed the Benzoin, strain the Lard and stir while cooling. U. S. 1880.

Following the alphabetical arrangement of the 1880 Pharmacopœia this preparation will be found under its new title, *Adeps Benzoinatus* (see page 76), but, as it belongs properly with the ointments, it is also given here.

3713. Benzoinated Petrolatum.

White (or amber) Petrolatum, . . . 15 ounces.
 White (or yellow) Wax, *q. s.* or . . . 1 ounce.
 Benzoin, in coarse powder, $\frac{1}{4}$ ounce.

Melt the Wax and Petrolatum together, and, having tied the Benzoin loosely in a piece of coarse muslin, suspend it in the melted mixture, stirring them frequently and continuing the heat for two hours at a temperature not exceeding 60° C. (150° F.); then remove the Benzoin, strain, and stir while cooling.

The amount of Wax used should vary a little to correspond with the melting point of the Petrolatum, 1 ounce being the

amount required for Petrolatum melting at 120° F., and about one fourth more for that which melts at 104° F.—the object being to have the preparation about the consistence of Lard.

The White Petrolatum with White Wax makes a beautiful Ointment, which remains fresh for any length of time. If made with the Amber Petrolatum and Yellow Wax, it is just as good in every way except in color.

3714. Unguentum Calaminæ. Br.

Ointment of Calamine.

Prepared Calamine, 1 ounce or 1 part.

Benzoated Lard, 5 ounces or 5 parts.

Mix them thoroughly.

3715. Unguentum Cantharidis.

Ointment of Cantharides.

The Br. P. formula is:

Cantharides, Yellow Wax, each 1 ounce, Olive Oil 6 fl.ounces. Infuse the Cantharides in the Oil in a covered vessel for 12 hours, then place the vessel in boiling Water for 15 minutes, strain through muslin with strong pressure, add the product to the Wax, previously melted, and stir constantly while the mixture cools.

The German formula is Cantharides 2 parts, Olive Oil 8 parts, digested for 10 hours on a steam-bath, expressed and filtered, and 7 parts of the Oil thus obtained added to 3 parts of Yellow Wax, previously melted, and well stirred while cooling.

The U. S. 1870 formula was Cantharides Cerate 120 grains, Resin Cerate 360 grains. Warmed and mixed together.

3716. Unguentum Cereum. G. P.

Wax Ointment — Cerasalbe.

Olive Oil, 7 parts.

Yellow Wax, 3 parts.

Melt the Wax and add the Oil.

This is similar to Simple Cerate except that Oil is used instead of Lard, making it much softer.

3717. Unguentum Cetacei. Br.

Ointment of Spermaceti.

This Ointment is officinal in the British Pharmacopœia, but possesses no advantages over Simple Ointment, and is not so good in any respect as Petrolatum Ointment or Benzoinated Petrolatum.

The British formula is as follows :

Spermaceti,	5	ounces av. or 10 parts.
White Wax,	2	ounces av. or 4 parts.
Almond Oil (expressed),	20	fl.ounces or 40 fl.parts.
Benzoin, in coarse powder,	$\frac{1}{2}$	ounce av. or 1 part.

Melt together with a gentle heat for two hours, remove the mixture, strain, and stir constantly while it cools.

This also may be made with :

Petrolatum,	4	ounces.
Spermaceti,	1	ounce.

Melt them together and stir while cooling.

3718. Unguentum Chrysarobini.

Chrysarobin Ointment.

The U. S. P. formula is :

Chrysarobin,	10	parts or 60 grains.
Benzoinated Lard,	90	parts or 540 grains.

Rub the Chrysarobin with the Benzoinated Lard, gradually added, until they are thoroughly mixed.

This is a new officinal, made from "Goa Powder," which has had some reputation in the treatment of skin diseases.

It may be made with Benzoinated Petrolatum instead of Lard. It is better made by heating the ingredients together.

The Br. P. formula is Chrysarobin 20 grains, Benzoinated Lard 480 grains, made in the same manner.

3719. Unguentum Creasoti. Br.

Ointment of Creasote.

Creasote,	1	fl.drachm or 1 fl.part.
Simple Ointment,	1	ounce av. or 8 parts.

Mix them thoroughly.

3720. Unguentum Diachylon.*Diachylon Ointment — Hebra Ointment.*

The U. S. formula is:

Lead Plaster,	60 parts or 6 ounces av.
Olive Oil,	39 parts or 4 fl.ounces.
Oil of Lavender,	1 part or 75 minims.

Melt together the Lead Plaster and Olive Oil at a moderate heat, then, having permitted the mass to become partly cool, incorporate with it the Oil of Lavender, and stir constantly until cold.

Petrolatum may be used in place of the Olive Oil, but the resulting preparation will be of firmer consistence, although this is rather an improvement than otherwise.

MADE WITH PETROLATUM.

Lead Plaster,	6 ounces av.
Petrolatum,	4 ounces av.
Oil of Lavender,	75 minims.

Melt the Lead Plaster and Petrolatum together at a moderate heat, and, when cool enough, add the Oil of Lavender and stir until cold.

The G. P. formula is, Lead Plaster 5 parts. Free it from Glycerin by melting and washing it with Water, and, when dry, melt with Olive Oil 5 parts, and stir until cold.

3721. Unguentum Elemi. Br.*Ointment of Elemi.*

Elemi,	$\frac{1}{4}$ ounce or 1 part.
Simple Ointment,	1 ounce or 4 parts.

Melt, strain through flannel, and stir constantly until the Ointment solidifies.

3722. Unguentum Eucalypti. Br.

Oil of Eucalyptus, by weight, . . .	1 ounce or 1 part.
Soft Paraffin (Petrolatum), . . .	} of each, 2 ounces or 2 parts.
Hard Paraffin (Paraffin Wax), . . .	

Melt the Paraffins together, add the Oil, and stir until cold.

3723. Unguentum Gallæ.

Ointment of Nutgall.

Nutmall, in No. 80 powder, . . . 10 parts or 48 grains.
Benzoinated Lard, 90 parts or 432 grains.

Rub the Nutgall with the Benzoinated Lard gradually added, until they are thoroughly mixed. U. S. 1880.

The Br. P. formula is Galls, in fine powder, 80 grains, Benzoinated Lard 1 ounce. Mix thoroughly.

3724. Unguentum Gallæ cum Opio. Br.

Ointment of Nutgall and Opium.

This Ointment, though not officinal in the U. S., is much more frequently prescribed than the preceding one. The following is the same as the British formula, except that Benzoinated Petrolatum is used instead of the Benzoinated Lard:

Nutmall, in No. 80 powder, 80 grains.
Opium, in No. 80 powder, 37 grains.
Benzoinated Petrolatum, 1 ounce av.

Rub the powders thoroughly with the Benzoinated Petrolatum.

It is much used for hemorrhoides and as an astringent.

3725. Unguentum Glycerini. G. P.

Glycerin Ointment.

This can hardly be called an Ointment as it contains no fatty bodies, but it is used for similar purposes as Ointments.

Tragacanth, powdered, 1 part.
Alcohol, 5 parts.
Glycerin, 50 parts.

Rub the Alcohol and Tragacanth together, add the Glycerin and heat the mixture on a steam-bath to form a white translucent Ointment of uniform consistence.

This is quite similar to the *Glycerinum Tragacanthæ* (1757) of the Br. P.

3726. Unguentum Glycerini Plumbi Subacetatis. Br.

Ointment of Glycerine of Subacetate of Lead.

Glycerine of Subacetate of Lead (1756),	1	part.
Soft Paraffin (Petrolatum),	4	parts.
Hard Paraffin (Paraffin Wax),	1½	part.

Melt the Paraffins together, add the Glycerine of Subacetate of Lead and stir until the mixture has cooled.

3727. Unguentum Hydrargyri.

Mercurial Ointment (Blue Ointment).

The U. S. P. 1880 formula is:

Mercury,	450	parts or 4½	ounces.
Lard,	225	parts or 2¼	ounces.
Suet,	225	parts or 2¼	ounces.
Compound Tincture of			
Benzoin,	40	parts or 3	fl.drachms.
Mercurial Ointment (½			
Mercury),	100	parts or 1	ounce.

Mix the Mercury with the Tincture of Benzoin in a mortar, add the Mercurial Ointment and triturate the mixture until globules of Mercury cease to be visible, then add the Lard and Suet, previously melted together and partially cooled, and continue the trituration until globules of Mercury cease to be visible under a magnifying power of ten diameters.

MADE WITH PETROLATUM.

Mercury,	4½	ounces.
Petrolatum,	3	ounces.
Yellow Wax,	1½	ounce.
Compound Tincture of Benzoin,	3	fl.drachms.
Mercurial Ointment,	1	ounce.

Make an Ointment in the same manner as above.

The Br. P. formula is Mercury, Prepared Lard, each 1 pound av., Prepared Suet 1 ounce av., rubbed together as above.

The G. P. directs Lard 13 parts, and Mutton Suet 7 parts, to be melted together and, when cold, to be incorporated with Mercury 10 parts.

Mercurial Ointment is popularly known as "Unguentum" or "Anguintum."

The Ointment, made with one third, instead of one half, Mercury, is generally sold by druggists, but should not be dispensed on physicians' prescriptions. This strength may be made by mixing with the 50 per cent. Ointment one half its weight of Petrolatum Ointment.

3728. Unguentum Hydrargyri Ammoniati.

Ointment of Ammoniated Mercury (White Precipitate).

Ammoniated Mercury, in very

fine powder, 10 parts or 52 grains.

Benzoinated Lard, 90 parts or 468 grains.

Rub the Ammoniated Mercury with the Ointment or Benzoinated Lard until they are thoroughly mixed. U. S. 1880.

The Br. P. formula is the same.

MADE WITH PETROLATUM.

Ammoniated Mercury, in very fine powder, 1 ounce.

Benzoinated Petrolatum, 9 ounces.

Rub the Ammoniated Mercury with the Benzoinated Petrolatum until they are thoroughly mixed.

The G. P. formula, under the title *Unguentum Hydrargyri Album*, is the same strength.

3729. Unguentum Hydrargyri Compositum. Br.

Compound Ointment of Mercury.

The British formula uses Yellow Wax and Olive Oil 3 ounces each, instead of the Petrolatum Ointment as here directed.

Mercurial Ointment, 6 ounces.

Petrolatum Ointment, 6 ounces.

Camphor, in fine powder, 1½ ounces.

Melt the Petrolatum Ointment, dissolve in it the Camphor, and, when partly cool, mix it thoroughly with the Mercurial Ointment.

3730. Unguentum Hydrargyri Iodidi Rubri. Br.*Ointment of Red Iodide of Mercury.*

Red Iodide of Mercury, in powder, . . . 16 grains.

Simple Ointment, 1 ounce av.

Mix them thoroughly. This was official in the U. S. P. 1870.
 Petrolatum Ointment may be used instead of Simple Ointment.

3731. Unguentum Hydrargyri Nitratis.*Ointment of Nitrate of Mercury (Citrine Ointment).*

Mercury, 7 parts or 1½ ounce.

Nitric Acid, 17 parts or 3⅔ ounces.

Lard Oil, 76 parts or 16⅓ ounces.

Heat the Lard Oil in a glass or porcelain vessel to a temperature of 70° C. (158° F.), then add, without stirring, 7 parts or 1½ ounce of Nitric Acid, and continue the heat so long as a moderate effervescence continues, and allow the mixture to cool. Dissolve the Mercury in the remainder of the Nitric Acid and, with the aid of sufficient heat to prevent the solution from crystallizing, add this solution to the mixture before it has become entirely cold, and mix them thoroughly, avoiding the use of an iron spatula. U. S. 1880.

There has been considerable discussion regarding the use of Petrolatum in making this Ointment, and the conclusion is that it is not admissible, for the reason that the reaction which is desired between the Nitric Acid and the olein of the Lard Oil, producing elaidin, does not occur with Petrolatum.

The Br. P. formula is Mercury, by weight, 4 ounces av., Nitric Acid 12 fl.ounces, Prepared Lard 15 ounces av., Olive Oil 32 fl.ounces. Dissolve the Mercury in the Nitric Acid with the aid of gentle heat, melt the Lard in the Oil by a steam or water-bath in a capacious vessel, and, while the mixture is at about 212° F. (100° C.) add the Solution of Mercury, also at the same temperature, mixing them thoroughly. Unless the mixture froths extensively, heat until it does. Then stir until cold.

3732. Unguentum Hydrargyri Nitratis Dilutum. Br.

Diluted Ointment of Nitrate of Mercury.

Nitrate of Mercury Ointment, Br. (3731), . . . 1 part.
Petrolatum, 2 parts.

Mix them.

3733. Unguentum Hydrargyri Oxidi Flavi.

Ointment of Yellow Oxide of Mercury.

Yellow Oxide of Mercury, in
very fine powder, 10 parts or 48 grains.
Ointment, 90 parts or 432 grains.

Rub the Oxide of Mercury with the Ointment, gradually added, until they are thoroughly mixed. U. S. 1880.

MADE WITH PETROLATUM.

Yellow Oxide of Mercury, in very fine powder, 1 ounce.
Petrolatum Ointment, 9 ounces.

Rub the Oxide of Mercury with the Ointment, gradually added, until they are thoroughly mixed.

3734. Unguentum Hydrargyri Oxidi Rubri.

Ointment of Red Oxide of Mercury — Red Precipitate Ointment.

Red Oxide of Mercury (Red
Precipitate), in very fine
powder, 10 parts or 48 grains.
Ointment, 90 parts or 432 grains.

Rub the Oxide of Mercury with a small quantity of the Ointment until a perfectly smooth mixture is obtained, then gradually add the remainder of the Ointment and mix thoroughly. U. S. 1880.

MADE WITH PETROLATUM.

Red Precipitate, in very fine powder, . . . 1 ounce.
Petrolatum Ointment, 9 ounces.

Rub the Red Precipitate with a small portion of the Ointment and then gradually with the remainder until thoroughly mixed. Made with Petrolatum, this Ointment remains permanent and unchanged, which is a great advantage over the official preparation.

The Br. P. Ointment is made with Red Oxide of Mercury 62 grains, Soft Paraffin $\frac{3}{4}$ ounce, Hard Paraffin $\frac{1}{4}$ ounce. Melt the Paraffins and, when cooling, incorporate the Mercury Oxide.

The G. P. formula, under the title *Unguentum Hydrargyri Rubrum*, is Red Oxide of Mercury 1 part, Paraffin Ointment 9 parts.

3735. Unguentum Hydrargyri Subchloridi. Br.

Ointment of Subchloride of Mercury.

Subchloride of Mercury, 80 grains.

Benzoated Lard, 1 ounce av.

Mix thoroughly.

This is more familiarly known as *Calomel Ointment*, and is much used as a mild healing absorbent dressing for sores.

3736. Unguentum Iodi.

Unguentum Iodinii. 1870 — Iodine Ointment.

Iodine, 4 parts or 20 grains.

Iodide of Potassium, 1 part or 5 grains.

Water, 2 parts or 10 minims.

Benzoinated Lard, 93 parts or 475 grains.

Rub the Iodine and Iodide of Potassium first with the Water and then with the Lard or Benzoinated Lard, gradually added, until they are thoroughly mixed, avoiding the use of an iron spatula. U. S. 1880.

The use of Petrolatum in making this Ointment is not recommended, as with it a greenish-black Ointment results, and the change that occurs is not yet well ascertained.

The Br. P. formula is Iodine, Iodide of Potassium, each 32 grains, Glycerin 1 fl.drachm, Prepared Lard 2 ounces av., made in the same manner.

The *Compound Iodine Ointment* of the U. S. P. 1870 contains 15 grains of Iodine, 30 grains Iodide of Potassium, 30 minims Water, 480 grains of Lard.

3737. Unguentum Iodoformi.

Iodoform Ointment.

Iodoform, in very fine powder, 10 parts or 50 grains.

Benzoinated Lard, 90 parts or 450 grains.

Rub the Iodoform with the Benzoinated Lard, gradually added, until they are thoroughly mixed. U. S. 1880.

The Br. P. formula is the same.

MADE WITH PETROLATUM.

Iodoform, in very fine powder, 1 ounce.

Benzoinated Petrolatum, 9 ounces.

Rub the Iodoform with a portion of the Benzoinated Petrolatum and then with the remainder, gradually added, until thoroughly mixed.

3738. Unguentum Mezerei.

Mezereum Ointment.

Fluid Extract of Mezereum, 25 parts or 1 fl.ounce.

Lard, 80 parts or 3¼ ounces av.

Yellow Wax, 12 parts or ½ ounce av.

Melt together the Lard and the Wax with a moderate heat, add the Fluid Extract and stir the mixture constantly until the Alcohol has evaporated, then continue to stir until cool. U. S. 1880.

MADE WITH PETROLATUM.

Fluid Extract of Mezereum, 1 fl.ounce.

Petrolatum, 3½ ounces av.

Yellow Wax, ½ ounce av.

Melt the Petrolatum and Yellow Wax together, add the Fluid Extract and stir the mixture constantly until the Alcohol has evaporated, then continue to stir until cool.

3739. Unguentum Paraffini. G. P.*Paraffin Ointment—Vaseline.*

This is directed to be prepared from :

Solid Paraffin (Paraffin Wax), 1 part.

Liquid Paraffin (Paraffin Oil), 4 parts.

By melting the Solid Paraffin and incorporating with it the Liquid Paraffin. This is similar to Petrolatum (2447).

3740. Unguentum Picis Liquidæ.*Tar Ointment.*

The U. S. P. formula for this Ointment is :

Tar, }
Suet, } each, equal parts.

Mix the Tar with the Suet, previously melted with a moderate heat, and, having strained the mixture through muslin, stir it constantly until cool.

This Ointment is not improved by using Petrolatum, but if it is used, one half as much Yellow Wax as is taken of Petrolatum should be used to give it the proper consistence.

The Br. P. formula is Tar 5 ounces, Yellow Wax 2 ounces. The Wax is melted and the Tar added, the mixture being stirred until cool.

3741. Unguentum Plumbi Acetatis. Br.*Ointment of Acetate of Lead.*

This Ointment, though not officinal in the U. S., is frequently prescribed. The following is the same as the British, except that Benzoinated Petrolatum is used instead of Benzoinated Lard.

Acetate of Lead, in very fine

powder, 12 grains or 2 parts.

Benzoinated Petrolatum, . . 1 ounce av. or 73 grains.

Mix them thoroughly.

The Cerate of Subacetate of Lead is generally preferred.

The G. P., under the title *Unguentum Plumbi*, directs Solution Subacetate of Lead 8 parts, Lard 92 parts, to be mixed together.

3742. Unguentum Plumbi Carbonatis.

Ointment of Carbonate of Lead.

Carbonate of Lead, in very

fine powder, 10 parts or 48 grains.

Benzoinated Lard, 90 parts or 432 grains.

Rub the Carbonate of Lead (in fine powder) with the Ointment or Benzoinated Lard, gradually added, until they are thoroughly mixed. U. S. 1880.

MADE WITH PETROLATUM.

Carbonate of Lead, in fine powder, . . . 1 ounce.

Benzoinated Petrolatum, 9 ounces.

Rub the Carbonate of Lead with the Benzoinated Petrolatum, gradually added, until they are thoroughly mixed.

The Br. P. formula is Carbonate of Lead, in fine powder, 62 grains, Simple Ointment 1 ounce av.

The G. P. formula, under the title *Unguentum Cerussæ*, is Carbonate of Lead 3 parts, Paraffin Ointment (Petrolatum) 7 parts.

3743. Unguentum Cerussæ Camphoratum or *Camphorated Carbonate of Lead Ointment* of the G. P. is made by rubbing Camphor, in powder, 5 parts, with Carbonate of Lead Ointment 95 parts.

3744. Unguentum Plumbi Iodidi.

Ointment of Iodide of Lead.

Iodide of Lead, 10 parts or 48 grains.

Benzoinated Lard, 90 parts or 432 grains.

Rub the Iodide of Lead (in fine powder) with the Ointment or Benzoinated Lard, gradually added, until they are thoroughly mixed. U. S. 1880.

MADE WITH PETROLATUM.

Iodide of Lead, in very fine powder, . . . 1 ounce.

Benzoinated Petrolatum, 9 ounces.

Rub the Iodide of Lead with the Benzoinated Petrolatum, gradually added, until they are thoroughly mixed.

The Br. P. formula is Iodide of Lead 62 grains, Simple Ointment 1 ounce av. Mix thoroughly.

3745. Unguentum Plumbi Tannici.*Ointment of Tannate of Lead.*

Tannic Acid,	1 part.
Solution Subacetate of Lead,	2 parts.
Lard,	17 parts.

Rub the Acid with the Solution of Lead to a smooth paste, then incorporate with the Lard. It should be freshly prepared.

3746. Unguentum Potassæ Sulphuratæ. Br.*Ointment of Sulphurated Potash.*

Sulphurated Potash,	30 grains or 5 parts.
Hard Paraffin (Paraffin Wax), $\frac{1}{4}$ ounce or 18 parts.	
Soft Paraffin (Petrolatum), $\frac{3}{4}$ ounce or 55 parts.	

Triturate the Sulphurated Potash in a glass or porcelain mortar and gradually add the melted Paraffins, rubbing them together until the Ointment is perfectly smooth and free from grittiness. This should be freshly prepared when wanted for use.

3747. Unguentum Potassii Iodidi.*Ointment of Iodide of Potassium.*

Iodide of Potassium,	12 parts or 61 grains.
Hyposulphite of Sodium,	1 part or 5 grains.
Boiling Water,	6 parts or 30 minims.
Benzoinated Lard,	81 parts or 413 grains.

Dissolve the Iodide of Potassium and the Hyposulphite of Sodium in the boiling Water in a warm mortar, then gradually add the Benzoinated Lard and mix thoroughly. U. S. 1880.

The Hyposulphite of Sodium is added to prevent the discoloration which formerly occurred in this Ointment after standing.

MADE WITH PETROLATUM.

Iodide of Potassium, in fine powder,	60 grains.
Hyposulphite of Sodium, in fine powder,	5 grains.
Boiling Water,	30 minims.
Benzoinated Petrolatum,	413 grains.

Dissolve the Iodide of Potassium and the Hyposulphite of Sodium with the boiling Water in a warm mortar, gradually add the Benzoinated Petrolatum and mix thoroughly.

The Br. P. formula is nearly the same as the U. S.

The G. P. formula, under the name *Unguentum Kalii Jodati*, is Iodide of Potassium 20 parts, Water 10 parts, Paraffin Ointment (Petrolatum) 170 parts.

3748. Unguentum Resinæ.

Ointment of Resin — Basilicon Ointment.

The Br. P. formula is:

Resin, in coarse powder,	8 ounces av.
Yellow Wax,	4 ounces av.
Simple Ointment,	16 ounces av.
Almond Oil,	2 fl.ounces.

Melt at a low temperature, strain the mixture while hot through flannel and stir constantly while it cools.

The G. P. formula is common Olive Oil 45 parts, Yellow Wax, Resin, Mutton Suet, each 15 parts, common Turpentine (gum) 10 parts. Melt them together, strain, etc. This is similar to the U. S. Compound Resin Cerate.

The U. S. Resin Cerate is similar, but a firmer preparation than either of the others. (See page 221.)

3749. Unguentum Rosmarini Compositum. G. P.

Rosemary Ointment — Nervensalbe.

Lard 16 parts, Mutton Suet 8 parts, Yellow Wax 2 parts, expressed Oil of Nutmeg 2 parts. Mix them together and add to the finished Ointment, Oil of Rosemary 1 part, Oil of Juniper Berries 1 part.

3750. Unguentum Sabinæ.

Savin Ointment.

The Br. P. directs this to be prepared from fresh Savin Tops 8 ounces, Yellow Wax 8 ounces, Benzoated Lard 16 ounces, by melting the Lard and Wax together on a water-bath and

digesting for 24 hours with the Savin, then removing the heat and expressing the Ointment through calico.

The G. P. directs Extract of Savin 1 part, with Wax Ointment 9 parts, melted together and mixed while cooling to form an Ointment.

The U. S. Cerate of Savine is made from the Fluid Extract and corresponds nearly with the foregoing. (See page 222.)

3751. Unguentum Staphisagriæ. Br.

Ointment of Staphesacre.

Staphesacre Seeds, 4 ounces or 1 part.

Benzoated Lard, 8 ounces or 2 parts.

Crush the Seeds and macerate them in the Lard, kept melted over a water-bath for two hours, strain through calico and set aside to cool. This contains about 10 per cent. of Oil obtained from the Seed.

3752. Unguentum Stramonii.

Stramonium Ointment.

Extract of Stramonium, . . . 10 parts or 51 grains.

Water, 5 parts or 25 minims.

Benzoinated Lard, 85 parts or 433 grains.

Rub the Extract with the Water until uniformly soft, then gradually add the Lard or Benzoinated Lard, and mix them thoroughly. U. S. 1880.

This may be made with Benzoinated Petrolatum instead of Lard.

3753. Unguentum Sulphuris.

Sulphur Ointment.

Sublimed Sulphur, 30 parts or 144 grains.

Benzoinated Lard, 70 parts or 336 grains.

Rub the Sulphur with the Lard or Benzoinated Lard, gradually added, until they are thoroughly mixed. U. S. 1880.

Precipitated or Lac Sulphur makes a much smoother Ointment, and is much to be preferred.

MADE WITH PETROLATUM.

Sublimed Sulphur, 3 ounces.
 Petrolatum, 7 ounces.

Mix them thoroughly by rubbing them together.

The Br. P. formula is Sublimed Sulphur 1 ounce mixed with Benzoated Lard 4 ounces.

3754. Unguentum Sulphuris Alkalinum.

Alkaline Sulphur Ointment.

Washed Sulphur, 96 grains.
 Carbonate of Potassium, 48 grains.
 Water, 24 minims.
 Benzoinated Lard, 312 grains.

Rub the Sulphur with the Carbonate of Potassium and the Water, gradually add the Benzoinated Lard and mix thoroughly. U. S. 1880.

This may be made with Benzoinated Petrolatum instead of Benzoinated Lard.

3755. Unguentum Sulphuris Iodidi. Br.

Ointment of Iodide of Sulphur.

Iodide of Sulphur, 30 grains or 5 parts.
 Hard Paraffin, $\frac{1}{4}$ ounce or 18 parts.
 Soft Paraffin, $\frac{3}{4}$ ounce or 55 parts.

Triturate the Iodide of Sulphur in a glass or porcelain mortar and gradually add the melted mixture of Paraffins, rubbing them together until cold.

3756. Unguentum Tabaci.

Ointment of Tobacco.

Tobacco, in fine powder, $\frac{1}{2}$ ounce.
 Lard, 8 ounces.
 Water, a sufficient quantity.

Moisten the Tobacco with a little Water, introduce it into a conical glass percolator, and, having pressed it firmly, pour

Water upon it until 4 fl.ounces of liquid have passed. Evaporate this liquid to the consistence of a soft extract, and mix it thoroughly with the Lard. U. S. 1870.

This may be made with Petrolatum instead of Lard.

3757. Unguentum Terebinthinæ.

Turpentine Ointment.

The Br. P. formula is Oil of Turpentine 1 fl.ounce, Resin, in coarse powder, 54 grains, Yellow Wax $\frac{1}{2}$ ounce av., Prepared Lard $\frac{1}{2}$ ounce av. Melt the solid ingredients together and, while cooling, add the Oil and stir.

The G. P. formula is Common Turpentine (gum), Yellow Wax, Oil of Turpentine, each equal parts by weight.

This is used as a stimulating Ointment for sores, ulcers, etc. The Br. preparation has less consistence than the German, and may be used when a very soft Ointment is desired, but the German is generally preferred.

3758. Unguentum Veratrinae.

Veratrine Ointment.

Veratrine,	4 parts or 20 grains.
Alcohol,	6 parts or 35 minims.
Benzoinated Lard,	96 parts or 480 grains.

Rub the Veratrine with the Alcohol in a warm mortar until dissolved, then gradually add the Benzoinated Lard and mix thoroughly. U. S. 1880.

MADE WITH PETROLATUM.

Veratrine,	20 grains.
Alcohol,	35 minims.
Benzoinated Petrolatum,	480 grains.

Rub the Veratrine with the Alcohol in a warm mortar until dissolved, then gradually add the Benzoinated Petrolatum and mix thoroughly.

The Br. P. formula is Veratrine 8 grains, Hard Paraffin (Paraffin Wax) $\frac{1}{4}$ ounce av., Soft Paraffin (Petrolatum) $\frac{3}{4}$ ounce av., Olive Oil 1 fl.drachm. Rub the Veratrine and Oil together and incorporate with the melted Paraffins.

3759. Unguentum Zinci Oxidi.

Oxide of Zinc Ointment.

Oxide of Zinc, 20 parts or 96 grains.

Benzoinated Lard, 80 parts or 384 grains.

Rub the Oxide of Zinc with an equal weight of Benzoinated Lard, previously melted, until the mixture is perfectly smooth, then add the remainder of the Benzoinated Lard and mix thoroughly. U. S. 1880

MADE WITH PETROLATUM.

Oxide of Zinc, 2 ounces.

Benzoinated Petrolatum, 8 ounces.

Rub the Oxide of Zinc with an equal weight of Benzoinated Petrolatum in a warm mortar until they are thoroughly and smoothly mixed, then add the remainder of the Benzoinated Petrolatum and mix them thoroughly.

The Br. P. *Ointment of Zinc* is Oxide of Zinc 80 grains, Benzoinated Lard 1 ounce av., mixed in the same manner as above directed.

The G. P. formula is common Oxide of Zinc 1 part, Lard 9 parts.

3760. Unguentum Zinci Oleati. Br.

Ointment of Oleate of Zinc.

Oleate of Zinc, 1 ounce or 1 part.

Soft Paraffin (Petrolatum), 1 ounce or 1 part.

Mix by the aid of a little heat and stir until nearly cold.

Unofficial Ointments.

The foregoing official Ointments include the greater share that are used to any extent in dispensing pharmacy, but many others are or have been used and are now occasionally called for. It would be impracticable to give detailed formulas for all of them, as the list of official Ointments is already sufficient for the general uses of pharmacy and medicine, so only the more important ones, for which there is some demand, are mentioned and classified, showing their composition. They can be made in the same general way as is directed for similar official Ointments. Solid drugs generally should be reduced to fine powder. Alkaloids should be rubbed with a few drops of Alcohol. Extracts should be slightly softened with Alcohol or Water. Ointment made with Lard or with Petrolatum may be used as a base, the latter

being generally preferable. Lard or Petrolatum alone are sometimes used when softer Ointments are desired. The following list shows the composition of the more important Unofficial Ointments:

SIMPLE UNOFFICIAL OINTMENTS.

No.	Ointment of	Composed of
3761	Alum	Alum 40 grains, Ointment 1 ounce.
3762	Ammonium Carb.	Carbonate Ammonium 1 drachm, Ointment 9 drachms.
3763	Arsenical (Mild) ...	Arsenic 3 grains, Ointment 1 ounce.
3764	Arsenical (Hospital)...	Arsenic 15 grains, Ointment 1 ounce.
3765	Arsenical (Cancer)	Arsenic 40 grains, Ointment 1 ounce.
3766	Arsenate of Iron	Arsenate of Iron 20 grains, Ointment 1 ounce.
3767	Arsenate of Sodium...	Arsenate of Sodium 30 grains, Ointment 1 ounce.
3768	Balsam Peru	Balsam Peru 1 drachm, Ointment 1 ounce.
3769	Balsams, other	The required Balsam 1 drachm, Ointment 1 ounce.
3770	Bromide Salts	The Bromide Salt 30 grains, Ointment 1 ounce.
3771	Bromine	Bromide Potassium 20 grs., Bromine 10 m., Ointment 1 oz.
3772	Brown (Ungt. Fuscum).	Nitric Oxide of Mercury 30 grains, Resin Ointment 1 oz.
3773	Cadmium Salts	The Cadmium Salt 1 drachm, Ointment 1 ounce.
3774	Caffeine	Caffeine 5 grains, Ointment 1 ounce.
3775	Camphor	Camphor 1 to 2 drachms, Ointment 1 ounce.
3776	Cantharidine	Cantharidine 1 grain, Ointment 1 ounce.
3777	Capsicum	Oleo-resin Capsicum 5 grains, Ointment 1 ounce.
3778	Catechu	Catechu 30 grains, Ointment 1 ounce.
3779	Chalk	Prepared Chalk $\frac{1}{4}$ ounce, Petrolatum 1 ounce.
3780	Chamomile	Chamomile Extract 1 drachm, Ointment 1 ounce.
3781	Charcoal	Charcoal 1 part, Resin Ointment 3 parts.
3782	Cherry Laurel	Cherry Laurel Oil 1 drachm, Ointment 9 drachms.
3783	Chloral Hydrate	Chloral Hydrate 1 drachm, Ointment 9 drachms.
3784	Chloride of Lead	Chloride of Lead 1 drachm, Ointment 9 drachms.
3785	Chlorine	Chlorine Water 1 part, Lard 9 parts.
3786	Chloroform	Chloroform 1 drachm, Ointment 9 drachms.
3787	Cocculus Indicus	Cocculus Indicus 2 drachms, Lard 8 drachms.
3788	Cod Liver Oil	Cod Liver Oil 7 parts, White Wax and Cetaceum each 1 pt.
3789	Colocynth	Colocynth Pulp 1 part, Lard 8 parts.
3790	Corrosive Sublimate...	Corrosive Sublimate 5 grains, Spermaceti Oint. 1 ounce.
3791	Croton Oil	Croton Oil 20 minims, Lard 1 ounce.
3792	Cyanide of Mercury ...	Mercury Cyanide 10 grains, Lard 1 ounce.
3793	Cyanide of Potassium ..	Cyanide of Potassium 5 grains, Cold Cream 1 ounce.
3794	Elder Flower	Elder Flowers and Lard, equal parts, boiled together.
3795	Elder Leaf, green	Elder Leaves 3 pts., Lard 3 pts., Suet 3 pts., boiled together.
3796	Emetina	Emetina 30 grains, Alcohol q. s., Lard 1 ounce.
3797	Euphorbium	Euphorbium 30 grains, Lard 1 ounce.
3798	Foxglove	Digitalis, fresh leaves, Lard, each equal pts., boiled together.
3799	Garlic	Garlic, fresh bruised 2 pts., Lard 3 pts., simmered together.
3800	Gold (Pomade d'Or) ...	Gold Leaf 12 grains, rubbed with Ointment 1 ounce.
3801	Gold Chloride	Chloride of Gold 12 grains, Ointment 1 ounce.
3802	Hellebore	White Hellebore 2 drachms, Petrolatum 1 ounce.
3803	Hemlock (Conium)	Conium Extract 1 drachm, Ointment 9 drachms.
3804	Hops	Hops, fresh, 1 part, Lard 5 parts, simmered together.
3805	Iodide of Sulphur	Sulphur Iodide 30 grains, Petrolatum 1 ounce.
3806	Laurel	Laurel Oil, expressed, 2 ozs., Suet 1 oz., Oil Turp. $1\frac{1}{2}$ dr.
3807	Lupuline	Lupulin 1 part, Lard 3 parts, digest by heat.
3808	Naphthalin	Naphthalin $\frac{1}{2}$ ounce, Petrolatum 8 ounces.
3809	Picrotoxin	Picrotoxin 10 grains, Petrolatum 1 ounce.
3810	Pitch (Black Basilicon).	Pitch, Resin, Beeswax, each 1 ounce, Olive Oil 2 ounces.
3811	Poplar Buds	Poplar Buds, fresh, 1 part, Lard 4 parts, digest with heat.
3812	Quinine	Sulphate of Quinine 2 drachms, Lard 6 drachms.
3813	Scrofularia	Figwort Leaves, fresh, Lard, each 2 parts, Suet 1 pt., boil.
3814	Squill	Squill, in fine powder, 1 part, Mercurial Ointment 2 parts.
3815	Strychnine	Strychnine 16 grains, Lard or Petrolatum 1 ounce.
3816	Sulphate of Zinc	Sulphate of Zinc, fine powder, 1 drachm, Lard 1 ounce.
3817	Virdigris	Verdigris 30 grains, Resin Ointment 1 ounce.
3818	Wood Soot	Wood Soot and Lard, mixed, equal parts.

Compound Unofficial Ointments.

Of the great number of Compound Ointments that are known but few, except those official in the leading pharmacopœias (and already given), are of sufficient interest to require notice. Others will be found among *The Standard Remedies*.

3820. Alkaline Ointment.—Carbonate of Sodium (Sal Soda) 1 drachm, fresh slacked Lime 30 grains, powdered Opium 1 grain, Lard or Petrolatum 1 ounce. Mix them.

3821. Antiperiodic Ointment. Br.—Sulphate of Quinine 90 grains, Saccharated Carbonate of Iron 60 grains, Oil Cajuput 30 drops, Petrolatum or fresh Butter 1 ounce. Mix them.

3822. Aromatic Ointment.—Yellow Wax, Oil of Laurel, expressed, each 1 ounce, Simple Ointment 13 ounces. Melt them together and add, when nearly cool, Oil of Juniper, Peppermint, Lavender, and Rosemary, each 40 minims.

3823. Astringent Ointment.—The official Ointment of Galls and the Lead Ointments are often used as Astringent Ointments. The following is also used: Powdered Catechu 90 grains, softened with boiling Water 2 drachms, and mixed with Spermaceti Ointment or Simple Ointment, melted until it forms a mass. Or, from Alum 1 ounce, Catechu 3 ounces, both in very fine powder, added to Olive Oil 10 ounces, in which Yellow Resin 4 ounces is melted, and stirred until cool.

3824. Egg Ointment.—Oil of Almonds 1½ ounce, Beeswax ½ ounce. Melt them together and, when cool but still fluid, add the Yolk of 1 Egg and 30 drops of Balsam of Peru and beat them thoroughly together.

3825. Egyptian Ointment.—Burnt Alum 1 part, Verdigris 10 parts, strong Vinegar 14 parts, purified, thick Honey 32 parts. Mix them well together.

3826. Juniper Tar Ointment.—Lard and Suet, each 6 parts, Beeswax 4 parts. Melt them together and, while cooling, add Oil of Juniper Tar (Oil of Cade) 16 parts, Oil of Lavender 1 part.

3827. Labdanum Ointment.—Labdanum 6 drachms, Petrolatum 2 ounces, Oil of Mace 1 drachm, Oil of Wormwood 10 drops, Balsam Peru 2 drachms. Make an Ointment.

3828. Mayer's Ointment — *Compound Lead Ointment* — *Amer. Disp.* — Olive Oil 2½ pounds, White Pine Turpentine ½ pound, Beeswax, unsalted Butter, each 4 ounces, Red Lead 1 pound, Honey 12 ounces, powdered Camphor 8 ounces. Melt the Oil, Turpentine, Beeswax, and Butter together and strain, then heat to nearly boiling and gradually add the Red Lead, stirring the mixture constantly until it becomes brown or black, then remove from the fire and, when it becomes somewhat cool, add to it the Honey and Camphor, previously mixed together.

3829. Ointment Nervine—*Nervine Balsam*.—Expressed Oil of Mace, Ox Marrow, each 4 ounces. Melt by gentle heat and add Oil of Rosemary 2 drachms, Oil of Cloves 1 drachm, Camphor 1 drachm, Balsam Tolu 2 drachms (the last two dissolved in Alcohol 4 drachms).

3830. Pomade pour le Toncher or Obstetrical Ointment.—Yellow Wax, Spermaceti, each 1 ounce, Olive Oil 16 ounces. Melt together, strain, add Solution of Caustic Soda 1 fl.ounce, and stir until nearly cold.

3831. Stramonium Ointment Compound—(*Beach's*).—Bittersweet, bark of root, Stramonium Leaves, Cicuta Leaves, Deadly Nightshade, Yellow Dock Root, each 2 ounces, Lard 1 pound, Venice Turpentine 2 ounces. Bruise the roots and leaves, cover them with Alcohol and digest with a moderate heat for four hours, then add the Lard and continue the heat until the leaves are crisped. Lastly, strain and express through linen, add the Turpentine and stir constantly until cold.

URANIUM.

Symbol, U; Atomic weight, 238.5.

This is a rare metal, discovered by Klaproth about a century ago, but seldom used. It is distinguished as having the greatest combining weight of any known element. It unites with Oxygen, forming Uranic Oxide, U_2O_3 , and with Chlorine, forming two Chlorides, U_2Cl_3 and UCl_2 . Its salts are used in photography, but are seldom employed in pharmacy.

UREA.



This is a constituent of urine, and is noted as being the first organic compound artificially produced. Artificial Urea is employed in medicine. Its salts are sometimes employed as diuretics.

3832. Nitrate of Urea.—This may be prepared by saturating artificial Urea with Nitric Acid, concentrating and crystallizing. The dose is from 2 to 5 grains as a diuretic, especially in dropsy. Other salts of Urea may be prepared in the same manner.

3833. Uric Acid—*Lithic Acid*.—This occurs in the urine of certain animals and in morbid conditions of the kidneys. It is supposed to be the principal cause of acute rheumatic affections, gout, etc., and is one of the most common constituents of urinary calculi.

VANADIUM.

Symbol, V; Atomic weight, 51.3.

A rare metallic element, discovered in certain iron and copper ores in various parts of the world. The salts of Vanadium are chiefly used in dyeing, but as it is very expensive it is only used by experienced dyers. Vanadium black is the richest and most permanent black dye known. An ink is also made with Vanadium Ammoniate, Acid, and infusion of Galls, which is very permanent and durable. With Oxygen it forms several oxides, but the most important salts of Vanadium are its ammonia compounds, known as *Vanadinate of Ammonium*.

3834.

VANILLIN.



Vanillin is the odorous crystalline principle of Vanilla and is chemically the Aldehyd of Methyl-protocatechuic Acid. It is also artificially prepared from the sap-wood or juice of pine trees, and from many other substances, by complex processes. It has been prepared and considerably sold for making Extract of Vanilla, but the flavor of the product lacks the richness and delicacy of the true extract or tincture made from Vanilla.

One ounce of Vanillin with $1\frac{1}{2}$ gallon of Cologne Spirit, $1\frac{1}{4}$ gallon of Water, and $\frac{1}{4}$ gallon of Syrup, colored with Caramel, produces a fair imitation of Vanilla Extract.

VAPORES — VAPORS.

In British Pharmacy Vapors are solutions of medicinal substances which are volatilized by passing through a suitable apparatus, and are intended to be used by inhalation. It seems hardly necessary to have made them official. For the inhalation of different substances different kinds of apparatus are required.

3835. Vapor Acidi Hydrocyanici—*Inhalation of Hydrocyanic Acid.*—Diluted Hydrocyanic Acid 10 to 15 minims, Water (cold) 1 fl.drachm. Mix in a suitable apparatus and let the vapor that arises be inhaled.

3836. Vapor Chlori—*Inhalation of Chlorine.*—Chlorinated Lime 2 ounces, Water (cold) a sufficiency. Put the powder into a suitable apparatus, moisten it with the Water and let the vapor that arises be inhaled.

3837. Vapor Coninæ—*Inhalation of Conine.*—Juice of Hemlock (Conium) $\frac{1}{2}$ fl.ounce, Solution of Potash 1 fl.drachm, distilled Water 1 fl.ounce. Put 20 minims of the mixture on a sponge in a suitable apparatus so that the vapor of hot water passing over it may be inhaled.

3838. Vapor Creasoti—*Inhalation of Creasote.*—Creasote 12 minims, boiling Water 8 fl.ounces. Mix the Creasote and Water in an apparatus so arranged that air may be made to pass through the solution and may afterward be inhaled.

3839. Vapor Iodi—*Inhalation of Iodine.*—Tincture of Iodine 1 fl.drachm, Water 1 fl.ounce. Mix in a suitable apparatus, which can be gently heated, and let the vapor that arises be inhaled.

3840. Vapor Olei Pini Sylvestris—*Inhalation of Fir-wool Oil.*—Oil of Fir-wool 40 minims, Light Carbonate of Magnesium 20 grains, Water a sufficiency. Rub the Oil with the Magnesium and gradually add sufficient Water to produce 1 fl.ounce. Put 1 fl.drachm of the mixture with 10 fl.ounces of cold Water and 10 fl.ounces of boiling Water into an apparatus so arranged that air may be made to pass through the solution and may afterward be inhaled.

Other Vapors.

A great variety of other volatile substances may be employed in the form of vapor in a similar manner.

3841. Vapor of Carbolic Acid is prepared in the same manner as Vapor of Creasote.

3842. Vapor of Nitrite of Amyl is prepared with Nitrite of Amyl 8 minims in Alcohol 1 ounce, and a fl.drachm used in a pint of Water at 100° F., for asthma, headache, etc.

3843. Vapors of Menthol, Thymol, and other similar substances are prepared in the same manner as Vapor of Fir-wool Oil.

3844. Vapor of Terebene and of Essential Oils, etc., are prepared in the same manner.

Besides this method of applying Vapors, *Steam Atomizers* are considerably used for the local treatment of the nasal organs and throat. By this means a spray of the medicinal substance is applied directly to the parts. Inhalations of Oxygen and other gaseous substances in the form of vapor or otherwise are also employed, with suitable apparatus.

VINA — WINES.

As considered in Pharmacy, Wines are liquid medicinal preparations in which Wine is chiefly used as the menstruum or vehicle for holding the medicinal principles in solution. They are similar to, but generally weaker than, Tinctures.

The basis of the Medicinal Wines is the fermented juice of different varieties of grapes — the light colored varieties being known in U. S. Pharmacy as *Vinum Album* or White Wine, and the dark varieties being known as *Vinum Rubrum* or Red Wine. In other pharmacopœias specific varieties of Wines are directed, as *Vinum Xericum*, Sherry Wine, *Vinum Oporto* or Port Wine, etc.

As found in the market, Wines possess scarcely sufficient alcoholic strength for the solution and preservation of most medicinal substances. The U. S. Pharmacopœia therefore directs that they shall be fortified with Alcohol sufficient to make up for this deficiency, as instanced in *Vinum Album Fortius*.

The following are the official Wines of the leading pharmacopœias:

3846. *Vinum Album.*

This is described in the U. S. P. as a pale amber-colored or straw-colored alcoholic liquid, made by fermenting the unmodified juice of the grape, freed from seeds, stems, and skins. It should not contain less than 10 nor more than 12 per cent., by weight, of Absolute Alcohol.

3847. *Vinum Album Fortius.*

Stronger White Wine.

White Wine, 7 parts or 55 fl.ounces.

Alcohol, 1 part or 9½ fl.ounces.

Mix them. When tested for Alcohol, as described under White Wine, Stronger White Wine should contain not less than 20 per cent. nor more than 25 per cent. of Absolute Alcohol, by weight. U. S. 1880.

The object of adding Alcohol is to have a Wine for pharmaceutical purposes that will contain a definite and sufficient quantity of Alcohol to dissolve and preserve medicinal agents with which it is combined. This preparation is used as the base of all the medicinal Wines of the U. S. 1880 Pharmacopœia, in place of "Sherry Wine," which was directed in all the formulas of the 1870 revision. While this change is no doubt beneficial in a general sense, the present preparations will not necessarily correspond in flavor nor appearance with those that have been formerly prepared for any Wine, except a Red Wine may be used.

3848.

Vinum Aloes.*Wine of Aloes.*

Purified Aloes, 6 parts or 1 ounce av.

Cardamom, 1 part or 73 grains.

Ginger, 1 part or 73 grains.

Stronger White Wine, sufficient to make a pint.

Mix the Aloes, Cardamom, and Ginger and reduce them to a moderately coarse powder, macerate the powder with 13 ounces of the Wine for seven days, with occasional agitation, and filter through paper, adding through the filter enough Wine to make a pint of the finished liquid. U. S. 1880.

The Br. formula is Socotrine Aloes 1½ ounce av., Cardamom Seeds, bruised, 80 grains, Ginger, in coarse powder, 80 grains, Sherry 40 fl.ounces. Macerate for seven days and filter.

The dose of Wine of Aloes is from 1 to 2 fl.drachms.

3849.

Vinum Antimonii*Wine of Antimony.*

Tartrate of Antimony and Po-

tassium, 4 parts or 29 grains.

Boiling Distilled Water, . . . 60 parts or 1 fl.ounce.

Stronger White Wine, suffi-

ent to make 1000 parts or a pint.

Dissolve the Tartrate of Antimony and Potassium in the Water, and, while the solution is hot, add 10 fl.ounces of Wine

and filter through paper, adding through the filter enough Wine to make the filtered liquid measure a pint. U. S. 1880.

Vinum Antimoniale or *Antimonial Wine*.— Under this title the Br. P. directs Tartrated Antimony 1 part or 40 grains, Sherry 219 fl.parts or 1 pint Imperial (20 fl.ounces).

Vinum Stibiatum of the G. P. is made with Tartrate of Antimony and Potassium 1 part, dissolved in Sherry Wine 250 parts.

The dose of Wine of Antimony is from 5 to 15 minims for cough and bronchial troubles, and a fl.drachm as an emetic, repeated if necessary.

3850. Vinum Aromaticum.

Aromatic Wine.

Lavender,	} each, 1 part or 72 grains.
Origanum,	
Peppermint,	
Rosemary,	
Sage,	
Wormwood,	

Stronger White Wine, sufficient to make 100 parts or a pint.

Mix the solid ingredients and reduce them to a coarse powder, moisten the powder with a fl.ounce of Stronger White Wine, pack it moderately in a conical glass percolator and gradually pour enough Stronger White Wine upon it to make the filtered liquid measure a pint. U. S. 1880.

This is somewhat similar to the *Vin Aromatique* of the French Codex.

3851. Vinum Aurantii. Br.

Orange Wine.

Wine made in Britain by the fermentation of a saccharine solution to which the fresh peel of the Bitter Orange has been added. Br.

This official Br. Wine is simply a Wine flavored with Orange, and it seems unnecessary to be to so much trouble to prepare it. It may be readily prepared by adding a sufficient quantity of Tincture of fresh Orange Peel or a Solution of Oil of Bitter Orange in Alcohol to Sherry or other White Wine.

Orange Wine is used for making flavored medicinal Wines.

3852. Vinum Camphoratum. G. P.*Wine of Camphor.*

Camphor,	1 part.
Alcohol,	1 part.
Mucilage of Acacia,	3 parts.
White Wine,	45 parts.

Dissolve the Camphor by rubbing with the Alcohol and gradually add the remaining ingredients. By using Water instead of Wine this may be dispensed as *Camphor Julep* when wanted.

3853. Vinum Chinæ. G. P.*Wine of Cinchona.*

Tincture of Cinchona,	1 part.
Glycerin,	1 part.
Sherry Wine,	3 parts.

Mix and set the mixture aside for three weeks, then filter. See, also, Wine of Calisaya (3875). Wine of Cinchona made from the alkaloids of the bark is generally preferred to this.

3854. Vinum Colchici Radicis.*Wine of Colchicum Root.*

Colchicum Root,	40 parts or 13¼ ounces av.
Stronger White Wine, sufficient to make	100 parts or 2 pints.

Reduce the Root to a No. 30 powder, and moisten it with 6 fl.ounces of Wine, pack it moderately in a conical percolator, and gradually pour enough Wine upon it to make the filtered liquid measure 2 pints. U. S. 1880.

This is a standard remedy for rheumatism and gout, the dose being 5 to 20 minims.

The Br. P. directs Colchicum Corm (root), in No. 20 powder, 4 ounces av., to be macerated with 20 fl.ounces of Sherry, then pressed and strained through calico and sufficient Sherry added to make 20 fl.ounces.

This is only about half the strength of the U. S. preparation. The dose is 10 to 30 minims.

3855. Vinum Colchici Seminis.*Wine of Colchicum Seed.*

Colchicum Seed, . . . 15 parts or $4\frac{3}{4}$ ounces av.

Stronger White Wine, suf-

ficient to make . . . 100 parts or 2 pints.

Reduce the Seed to a No. 20 powder and macerate it for seven days with 30 fl.ounces of the Wine, then filter and add through the filter enough Wine to make 2 pints. U. S. 1880.

This is given for Rheumatism, etc., the dose being 10 to 20 minims.

The G. P. directs Colchicum Seed 1 part, to be macerated with Sherry Wine 10 parts, for eight days, then expressed and the liquid filtered.

The dose is 10 to 30 minims.

3856. Vinum Ergotæ.*Wine of Ergot.*

Ergot, in No. 30 powder, 15 parts or $4\frac{3}{4}$ ounces av.

Stronger White Wine,

sufficient to make . . . 100 parts or 2 pints.

Moisten the powder with 10 fl.ounces of Stronger White Wine, pack it moderately in a cylindrical percolator and gradually pour enough Stronger White Wine upon it to make 2 pints. U. S. 1880.

This preparation, which was formerly very much prescribed and used by physicians, is now but little employed, as the Fluid Extract is more concentrated and convenient.

3857. Vinum Ferri. Br.*Wine of Iron.*

Iron Wire, 1 ounce or 1 part.

Sherry, 20 fl.ounces or 20 fl.parts.

Macerate for 30 days in a closed vessel, the Iron being almost but not wholly immersed in the Wine, and the vessel frequently shaken and the stopper removed, then filter.

The dose is 1 to 4 fl.drachms.

3858. Vinum Ferri Amarum.*Bitter Wine of Iron.*

Solution of Citrate of Iron and Quinine,	8 parts.
Tincture of Sweet Orange Peel,	12 parts.
Syrup,	36 parts.
Stronger White Wine,	44 parts.
To make	100 parts.

Mix and filter through paper. U. S. 1880.

Few druggists keep the solution of Citrate of Iron and Quinine on hand, and if it is desired to make this preparation from the officinal formula or its equivalent, the scale salt, Citrate of Iron and Quinine may be used. The following is identical in composition with the officinal formula :

Citrate of Iron and Quinine (soluble)	580 grains.
Tincture of Sweet Orange Peel,	4 fl.ounces.
Syrup,	10 fl.ounces.
Stronger White Wine,	16 fl.ounces.
Water, sufficient to make	2 pints.

To 1 ounce of hot Water, in an evaporating dish, gradually add the Citrate of Iron and Quinine, agitating it gently over a spirit lamp until the salt is dissolved, add the solution to the Tincture, then mix with the Syrup and Wine and add enough Water to make the measure 2 pints.

This is unlike the Bitter Wine of Iron furnished by manufacturers, being much stronger of both Iron and Quinine. See 3876.

3859. Vinum Ferri Citratis.*Wine of Citrate of Iron.*

Citrate of Iron and Ammonium,	4 parts or 580 grains.
Tincture of Sweet Orange Peel,	12 parts or 4½ fl.ounces.
Syrup,	12 parts or 3 fl.ounces.
Stronger White Wine,	72 parts or 23 fl.ounces.

Mix and filter through paper. U. S. 1880.

The Citrate of Iron should be dissolved in an ounce of warm Water before adding to the other ingredients.

The Br. P. formula is Citrate of Iron and Ammonium 160 grains or 1 part, Orange Wine 20 fl.ounces or 55 fl.parts. Dissolve and let the solution remain for three days in a closed vessel, shaking occasionally; afterwards filter.

The dose is from a teaspoonful to a tablespoonful.

Other soluble salts of Iron that are not precipitated by the acid of the Wine may be used.

3860. Vinum Ipecacuanhæ.

Wine of Ipecac.

Fluid Extract of Ipecac, . 7 parts or $2\frac{1}{4}$ fl.ounces.

Stronger White Wine, . 93 parts or 30 fl.ounces.

Mix them and filter through paper. U. S. 1880.

The Br. P. formula is Ipecacuanha, coarsely powdered, 1 ounce, Acetic Acid 1 fl.ounce, distilled Water a sufficiency, Sherry 20 fl.ounces. Macerate the powder in the Acid for 24 hours, transfer to a percolator and pass sufficient distilled Water through it to produce 20 fl.ounces of the liquor, evaporate the product to dryness over a water-bath, powder the residue and macerate it in the Sherry for 48 hours, with occasional agitation, and filter.

The G. P. directs 1 part of Ipecac to be macerated with 10 parts of Sherry Wine.

It will be observed that the U. S. preparation represents 7 per cent., the Br. 5 per cent., and the German 10 per cent. of the drug.

The dose is from 5 to 20 minims, as an expectorant, and from 1 to 3 fl.drachms, as an emetic.

3861. Vinum Opii.

Wine of Opium.

U. S. P. 1870.

Opium, in powder, 960 grains.

Cinnamon, in powder, 60 grains.

Cloves, in powder, 60 grains.

Sherry Wine, sufficient to make a pint.

U. S. P 1880.

Powdered Opium,	829 grains.
Cinnamon, in powder,	73 grains.
Cloves, in powder,	73 grains.
Stronger White Wine, sufficient to make a pint.	

To the mixed powders add 14 fl.ounces of the Wine and macerate the mixture for seven days, with occasional agitation, then transfer it to a filter and gradually pour enough Wine upon it to make the filtered liquid measure a pint. U. S. 1880.

Although this preparation is now but seldom used, the difference in the strength of Opium should be noted, the 1880 being about one third weaker than the 1870.

The Br. P. directs Extract of Opium 1 ounce av., Cinnamon Bark, bruised, 75 grains, Cloves, bruised, 75 grains, Sherry 1 pint. Macerate for seven days in a closed vessel and filter.

The dose is 10 to 40 minims.

3862. Vinum Pepsini. G. P.

Wine of Pepsin.

Pepsin,	50 parts.
Glycerin,	50 parts.
Water,	50 parts.
White Wine,	1845 parts.
Hydrochloric Acid,	5 parts.

Rub the Pepsin, Glycerin, and Water together to a thin paste, then add the Wine and Acid, set aside for six days, with occasional stirring, and filter. See also Wine of Pepsin (3883).

3863. Vinum Quininae. Br.

Wine of Quinine.

Sulphate of Quinine,	20 grains	or	1 part.
Citric Acid,	30 grains	or	1½ part.
Orange Wine,	20 fl.ounces	or	438 parts.

Dissolve first the Citric Acid and the Quinine salt in the Wine, allow the solution to remain for three days in a closed vessel, shaking it occasionally, and afterwards filter.

A fl.ounce contains 1 grain of Quinine. Dose, 1 to 2 table-spoonfuls.

A formula for Quinine Wine was given in a former edition of FENNER'S FORMULARY, double the strength of this. It was Sulphate of Quinine 32 grains, Sherry Wine 12 fl.ounces, Alcohol 2 fl.ounces, Syrup 1 ounce, Soluble Flavoring 1 ounce.

A tablespoonful contains 1 grain of Quinine.

3864.**Vinum Rhei.***Wine of Rhubarb.*

Rhubarb, No. 30 powder, . . . 10 parts or 730 grains.

Calamus, No. 30 powder, . . . 1 part or 73 grains.

Stronger White Wine, suffi-

cient to make 100 parts or a pint.

Moisten the mixed powders with 2 ounces of Stronger White Wine, pack the mixture in a conical glass percolator and gradually pour enough Stronger White Wine upon it to make the filtered liquid measure a pint. U. S. 1880.

The Br. P. formula is Rhubarb Root, in coarse powder, 1½ ounce av., Canella bark, in coarse powder, 60 grains, Sherry 20 fl.ounces. Macerate for seven days in a closed vessel, then strain, press, filter, and add Sherry to make 20 fl.ounces.

3865.**Vinum Rubrum.***Red Wine.*

The U. S. P. describes this as a deep-red alcoholic liquid, made by fermenting the juice of colored grapes in presence of their skins. It should contain not less than 10 nor more than 12 per cent., by weight, of Absolute Alcohol.

3866.**Vinum Xericum.***Sherry.*

This is a light-colored Spanish Wine, which was formerly directed to be used in the U. S. P., and is still directed in the Br. P. It contains a larger percentage of Alcohol than most Wines, about 17 per cent. being the average.

Other varieties of Wine are also used for making the official preparations, the California and native Wines being considerably used. It is only required that they contain sufficient alcohol to keep the preparations.

Other Medicinal Wines.

The foregoing Wines are those official in the leading pharmacopœias, but besides these are many unofficial medicinal Wines which are considerably used, the most important among them being known as elegant preparations. They are, therefore, given the same prominence as the official Wines.

3870. Prepared Wine.

For making medicinal Wines, containing organic salts or principles, or salts of Iron, it is necessary to use a Wine which is free from tannin or astringent principles which will cause discoloration or precipitation. Many of the Wines, also, have not sufficient alcoholic strength to keep the preparations in which they are combined, and it is necessary to add more Alcohol to them, as is directed for making the Stronger White Wine of the U. S. P.

In making the following Wines, therefore, it is expedient to have a Prepared Wine which corresponds with these requirements, as follows:

White Wine, Sherry or native,	7 pints.
White of Egg,	1 fl.ounce.
Alcohol,	1 pint.

Beat the White of Egg to a froth and mix it with the Wine, heat to about 170° F., or until the albumen is coagulated, then cool, add the Alcohol and, after standing a few hours, filter clear through paper.

This serves as a basis for all the medicinal Wines which follow, and may with advantage be used in the official Wines foregoing in place of the Stronger White Wine directed.

3871. Aromatic Wine.

Cinnamon, in fine powder,	1 ounce av.
Nutmeg, in fine powder,	1 ounce av.
Cloves, in fine powder,	1 ounce av.
Soluble Flavoring,	2 fl.ounces.
Prepared Wine,	2 pints.

Macerate for 14 days and filter. Dose, a tablespoonful.

3872. Wine of Beef.

Leibig's Extract of Meat,	1 ounce av.
Elixir,	4 fl.ounces.
Prepared Wine,	12 fl.ounces.

Rub the Extract of Meat with the Elixir and add the Wine. After standing a few days, filter.

A tablespoonful, which is the usual dose, represents 1 ounce of fresh beef.

This preparation is really much more desirable than the popular Wine of Beef and Iron, as the Iron is better in some other combination than with the beef. See remarks after Wine of Beef and Iron.

3873. Wine of Beef and Iron.

Leibig's Extract of Meat,	$\frac{1}{2}$ ounce av.
Phosphate of Iron, in scales (1880),	64 grains.
(Other soluble salts of Iron may be used.)	
Elixir,	4 fl.ounces.
Prepared Wine,	12 fl.ounces.

Rub the Extract of Meat with the Elixir, dissolve the Iron salt in about $\frac{1}{2}$ fl.ounce of hot Water and add to the Wine, then mix the Wine with the mixture of Beef, etc., and set aside, agitating occasionally, for several weeks, then filter.

A tablespoonful represents $\frac{1}{2}$ ounce of fresh Beef and 2 grains of the Iron salt.

In this preparation an action between the salts which are contained in the Meat Extract, the acid of the Wine, and the soluble salt of Iron which is used, continues to take place for some time after the preparation is made, resulting in the reduction of a portion of the Iron salt to an insoluble salt (mainly Oxide of Iron). This cannot be avoided in the preparation except by the introduction of undesirable agents, and the only way to make a satisfactory Wine of Beef and Iron is to let it stand until the action is completed, before filtering, for, if filtered when freshly made, it will soon precipitate and continue to do so after repeated filtrations unless allowed to stand at least four weeks after being made, when it should be filtered.

3874. Wine of Beef, Iron, and Cinchona.

Sulphate of Quinine,	5 grains.
Sulphate of Cinchonidine,	10 grains.
Wine of Beef and Iron,	1 pint.

Rub the Sulphates with a portion of the Wine of Beef and Iron, add the remainder, and, after standing, filter.

A dessertspoonful of this preparation represents about 10 grains of Cinchona in addition to the Wine of Beef and Iron.

3875. Wine of Calisaya.*Wine of Cinchona.*

Sulphate of Quinine,	60 grains.
Sulphate of Cinchonidine,	90 grains.
Elixir,	2 pints.
Prepared Wine,	6 pints.

Mix the Wine and Elixir, rub the Sulphates first with a portion of the mixture, then add the remainder and color as desired with Caramel and Cochineal Red.

A dessertspoonful, the usual dose, represents about 10 grains of Cinchona or Calisaya Bark.

This may also be prepared from the bark if desired, by percolating $1\frac{1}{3}$ ounce of the bark with the mixture of Elixir and Wine sufficient to make a pint of the preparation. Also, by mixing $1\frac{1}{3}$ fl.ounce of Fluid Extract of Calisaya or Cinchona, either plain or detannated, with enough of the mixed Wine and Elixir to make a pint.

The preparation made from the salts is, however, generally preferred, and is much less trouble to make than from the bark.

3876. Bitter Wine of Iron.*Wine of Cinchona and Iron.*

The formula for this preparation is now official in the U. S. P., and is given, with suggestions, etc., on page 1002. It may be added here, however, that any soluble salt of Iron may be used, and an equivalent quantity of the salts of Cinchona added.

We give the following formula, which will probably give better general satisfaction than those mentioned :

Sulphate of Quinine,	60	grains.
Sulphate of Cinchonidine,	90	grains.
Phosphate of Iron, in scales (1880),	2	ounces av.
Elixir,	1 $\frac{3}{4}$	pint.
Prepared Wine,	6	pints.
Water,	$\frac{1}{4}$	pint.

Rub the Sulphates with the Elixir and add the Prepared Wine, dissolve the Iron salt in the Water by the aid of heat, and *add the Solution of Quinine, etc., gradually to the Solution of Iron*, with constant stirring, until they are thoroughly mixed, and filter if necessary.

As thus prepared it will be a light, greenish-colored preparation. It may be colored dark with caramel, or reddish-brown with caramel and cochineal red.

If Citrate of Iron and Ammonium is used instead of the Phosphate, it imparts the desired color, but is more liable to precipitate after standing. It may be more highly flavored, if desired, by adding Soluble Flavoring.

This preparation represents in a dessertspoonful, the usual dose, about 10 grains of Cinchona and 2 grains of the Iron salt.

3877. Wine of Calisaya, Iron, and Strychnine.

Wine of Cinchona, Iron, and Strychnine.

Sulphate of Strychnine,	1 $\frac{1}{2}$	grain.
Bitter Wine of Iron,	1	pint.

Dissolve the Strychnine salt by rubbing with separate portions of the Bitter Wine of Iron, or use Solution of Strychnine (1942) 1 $\frac{1}{2}$ fl.drachm instead of the salt.

A fl.drachm contains $\frac{1}{100}$ grain of Strychnine combined with Bitter Wine of Iron.

3878. Wine of Coca or Erythroxyton.

Coca Leaves, in coarse powder,	3	ounces av.
Elixir,	6	fl.ounces.
Prepared Wine,	12	fl.ounces.

Percolate the drug with the mixed Wine and Elixir until 1 pint is obtained.

This may also be made by mixing 3 fl.ounces of Fluid Extract of Coca with a mixture of 2 parts of Prepared Wine and 1 part of Elixir, sufficient to make 1 pint.

The dose is a teaspoonful to a dessertspoonful or more.

3879. Wine of Cotton Root or Gossypium.

This is most readily prepared from the Fluid Extract, as follows:

Fluid Extract of Cotton Root,	4 fl.ounces.
Prepared Wine,	8 fl.ounces.
Elixir,	4 fl.ounces.

Mix them. As a portion of the properties of Cotton Root is insoluble except in Alcohol a precipitate forms, and the preparation must be filtered.

This is given in doses of 1 to 4 fl.drachms as a uterine tonic.

3880. Wine of Damiana or Turneria.

Fluid Extract of Damiana,	3 fl.ounces.
Prepared Wine,	10 fl.ounces.
Elixir,	3 fl.ounces.

Mix them and, after standing, filter.

The dose is 1 to 4 fl.drachms as a diuretic and aphrodisiac.

3881. Wine of Iron.

This may be prepared from any of the soluble salts of Iron. The following will give the best satisfaction:

Phosphate of Iron, in scales (1880),	256 grains.
Elixir,	5 fl.ounces.
Prepared Wine,	10 fl.ounces.
Water,	$\frac{3}{4}$ fl.ounce.

Dissolve the Iron salt in the Water by the aid of heat and add to the solution, first, the Elixir, then the Wine, and, after standing, filter if necessary.

A fl.drachm contains 2 grains of the Iron salt. The dose is a teaspoonful or more.

3882. Wine of Pancreatin.

Powdered Pancreatin,	160	grains.
Elixir,	4	fl.ounces.
Prepared Wine,	12	fl.ounces.
Soluble Flavoring,	$\frac{1}{2}$	fl.ounce.

Mix them and macerate for several days, with occasional agitation, then strain through muslin or filter through coarse paper.

This may also be prepared by macerating fresh Pancreas of the pig, chopped fine, with a mixture of Prepared Wine and Elixir, in the same proportion as above, using 1 pint of the mixture to half a pound of the chopped pancreas.

A tablespoonful of this Wine represents 5 grains of Pancreatin. The dose is a dessertspoonful to a tablespoonful.

3883. Wine of Pepsin.

The formula for this Wine is given among the official preparations, but the product prepared from it does not correspond with that usually found on the market by that name, which may be made as follows:

Pepsin, in scales,	256	grains.
Hydrochloric Acid,	30	minims.
Distilled Water,	1	fl.ounce.
Prepared Wine,	15	fl.ounces.

Rub the Pepsin to a coarse powder and macerate with the Water until it softens to a gelatinous mass, then add the Hydrochloric Acid and the Prepared Wine, and agitate occasionally until the Pepsin is dissolved, and strain through muslin. Do not filter. This is the most effective Wine of Pepsin, but, as it is not sweetened nor flavored, it is not so pleasant as the following:

Saccharated Pepsin,	256	grains.
Elixir,	4	fl.ounces.
Hydrochloric Acid,	15	minims.
Soluble Flavoring,	$\frac{1}{2}$	fl.ounce.
Prepared Wine,	12	fl.ounces.

Mix and macerate, with occasional agitation, for several days, then strain or filter through coarse paper.

Wine of Pepsin may also be made by macerating the freshly dissected inner coating of the pig's stomach with Prepared Wine. When thus made there is no very definite strength to the preparation, but the general rule is to use one stomach to make a pint of the preparation.

The dose of Wine of Pepsin is from a teaspoonful to a tablespoonful.

Combinations of Wine of Pepsin with Bismuth are advertised by manufacturers, but they cannot be prepared except by neutralizing the Wine which is used, and the Elixirs of Pepsin and Bismuth are more desirable.

3884. Wine of Pepsin and Iron.

Phosphate of Iron, in scales (1880), . . . 128 grains.

Wine of Pepsin, 1 pint.

Dissolve the Iron salt in $\frac{1}{2}$ fl.ounce of Water and add to the Wine of Pepsin.

A dessertspoonful contains 2 grains of the Iron salt.

3885. Wine of Tar.

Pine Tar, 1 ounce av.

Pine Sawdust, 2 ounces av.

Elixir, 4 fl.ounces.

Prepared Wine, sufficient to make . . a pint.

Rub the Tar in a mortar with the Pine Sawdust, mix the Elixir with 12 fl.ounces of the Prepared Wine and rub with the Tar, etc., in a mortar, filter and add through the filter sufficient Prepared Wine to make 1 pint.

3886. Vitalized Wine.

Phosphorus, $\frac{1}{6}$ grain.

Absolute Alcohol, 1 fl.ounce.

Glycerin, 1 fl.ounce.

Phosphate of Iron, 64 grains.

Prepared Wine, 14 fl.ounces.

Dissolve the Phosphorus in the Absolute Alcohol by means of a water-bath, add the Glycerin, then the Wine, dissolve

the Iron salt in the $\frac{1}{2}$ fl.ounce of Water and add to the solution.

The dose is a dessertspoonful to a tablespoonful.

3887. Wine of Wild Cherry.

Fluid Extract of Wild Cherry, . . . 2 fl.ounces.
 Glycerin, 1 fl.ounce.
 Elixir, 4 fl.ounces.
 Prepared Wine, sufficient to make . . 1 pint.

Mix them and, after standing 24 hours, filter.

This may also be prepared by percolating the bark with the liquids, or by crushing 2 ounces of Wild Cherry Pits and macerating with the mixture of Elixir, Wine, etc., sufficient to make 1 pint.

The dose is a dessertspoonful.

3888. Wine of Wild Cherry and Iron.

As the Wine of Wild Cherry, prepared from the bark, contains considerable astringent or tannin, it will not combine with Iron without making an inky mixture, except it is detannated, which may be done as directed (515). The preparation may then be made as follows:

Wine of Wild Cherry, detannated, . . . 1 pint.
 Phosphate of Iron, in scales (1880), . . 128 grains.

Dissolve the Iron in $\frac{1}{2}$ fl.ounce of hot Water and add to the Wine.

As the detannated Wine of Wild Cherry contains little else of the medicinal properties of the bark except the Hydrocyanic Acid and flavoring ingredients, a preparation which answers the purpose may be made from the following formula:

Oil of Cherry Laurel Leaves, 15 minims.
 Hydrocyanic Acid, diluted, U. S., . . 30 minims.
 Phosphate of Iron, in scales (1880), . . 128 grains.
 Glycerin, 1 fl.ounce.
 Elixir, 4 fl.ounces.
 Prepared Wine, to make 1 pint.

Dissolve the Iron salt in $\frac{1}{2}$ fl.ounce of hot Water and add to the mixed Wine, Glycerin, and Elixir, then add the Acid and

Oil, mixing them thoroughly together, color with Caramel and, after standing a few days, filter. Other soluble salts of Iron may be used instead of the Phosphate.

Other Medicinal Wines.

But few Medicinal Wines, except those already noted, are now used in medicine.* Wine was once a favorite vehicle for exhausting medicinal principles and the administration of medicine, but has now given way to more stable and uniform alcoholic liquids. A few Wines that are now occasionally called for are noticed as follows:

3889. Antiscrobutic Wine — (Paris Codex).— Fresh Horseradish Root 3 ounces, Scurvygrass $1\frac{1}{2}$ ounce, Watercress Leaves $1\frac{1}{2}$ ounce, Buckbean $1\frac{1}{2}$ ounce, Mustard Seed $1\frac{1}{2}$ ounce, Chloride of Ammonium $5\frac{1}{2}$ drachms. Wine 5 pints. Compound Spirit of Scurvygrass $1\frac{3}{4}$ ounce. Macerate for 14 days, drain, and express.

3890. Wine of Comfrey Compound — *Restorative Wine Bitters* — (Amer. Disp.).— Comfrey Root, Solomon's Seal Root, Helonias Root, each in coarse powder, 1 ounce, Chamomile Flowers, Colombo Root, Gentian Root, Cardamom Seed, Sassafras Bark, each in coarse powder, $\frac{1}{2}$ ounce. Sherry Wine 4 pints, boiling Water a sufficient quantity. Pour boiling Water upon the drugs in a covered vessel, sufficient to cover them, let macerate 24 hours, then add the Wine, macerate for 14 days, express, and strain.

3891. Wine of Gentian Compound — *Bitter Wine Tonic*.— This may be prepared by mixing 4 fl.drachms of Fluid Extract of Gentian Compound with 4 fl.ounces of Elixir and 12 fl.ounces of Prepared Wine.

A *Bitter Wine of Iron* may be made by adding 128 grains of Phosphate of Iron to this preparation. This is desirable for some purposes, for example, it may be combined with Iodide of Potassium, while the Bitter Wine of Iron made from Cinchona salts is not compatible with it.

3892. Wine of Golden Seal Compound — (Amer. Disp.).— Golden Seal Root, Tulip Tree Bark, Bitterroot, each in fine powder, 1 drachm, Prickly-Ash Berries, Sassafras Bark, Capsicum, each in fine powder, $\frac{1}{2}$ drachm. Sherry Wine 3 pints. Macerate 14 days and filter. Dose, a tablespoonful.

3893. Wine of Hellebore Compound — (Amer. Disp.) — Black Hellebore, in coarse powder, Logwood, ground, Helonias Root, in powder, each 2 ounces, Sherry Wine sufficient to make $1\frac{1}{2}$ pint. Uterine tonic, etc. Dose, tablespoonful or more.

3894. Simple Wines of Drugs.— Wines may be made from many roots barks, leaves, flowers, etc., by macerating the substances, in coarse powder, with Sherry or other Wine, or by adding their fluid extracts to Wine. The proportion is usually 1 ounce in a pint of Wine, for ordinary preparations, and a less quantity of more powerful drugs.

ZINCUM — ZINC.

Symbol, Zn; Atomic weight, 64.9; Sp. gr. 6.8 to 7.2.

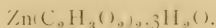
This elementary metal was known to the ancient metal-workers, but was first introduced to notice by Paracelsus in the 16th century. It is obtained by roasting its ores, by which it is volatilized, its vapor being collected in suitable receivers under water. It is a bluish-white metal, tough and ductile when cold, brittle and easily pulverized when heated to about 400° F.; is fused at 773° F., and burns with a bright green flame when heated to 941° F. in contact with the air. It is grouped with Aluminium, Cerium, and Cadmium, as it resembles them in physical properties. In the arts it is one of the most important metals, being extensively used in the manufacture of a great variety of useful and ornamental articles, and, combined with copper, forming brass and other alloys, which are of great importance. In pharmacy Zinc is the source of several important salts which are used in medicine and for other purposes.

The official salts of Zinc are as follows:

3895.

Zinci Acetas.

Acetate of Zinc — White Vitriol.



This is official in nearly all countries. The Br. P. formula for preparing it is:

Carbonate of Zinc, 7 2 ounces av.

Acetic Acid, 5 fl.ounces or a sufficiency.

Distilled Water, 6 fl.ounces.

Add the Carbonate of Zinc, in successive portions, to 3 ounces of the Acetic Acid, previously mixed with the Water in a flask, heat gently, add by degrees the remainder of the Acid till the Carbonate is dissolved, boil for a few minutes, filter while hot and set it aside for two days to crystallize. The crystals may be removed and more obtained by concentrating the liquid. The crystals are drained and dried on porous tiles.

Uses.—This salt is used for injections and washes, and is given as a tonic in doses of 1 to 2 grains, and as an emetic in doses of 10 to 20 grains.

3896.

Zinci Bromidum.*Bromide of Zinc.*

ZnBr.

This is official in the U. S. P. The formula is not given, but it may be made by double decomposition between Bromide of Potassium and Sulphate of Zinc, as follows:

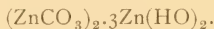
Bromide of Potassium, . . . 100 parts or grains.

Sulphate of Zinc, 240 parts or grains.

Dissolve them, each separately, in the smallest requisite quantity of hot Water and mix the solutions while hot, when the mixture is cool add twice its volume of Alcohol, filter through asbestos to separate the Sulphate of Potassium, which is precipitated, and evaporate the filtered liquid to dryness and granulation.

Uses.—This salt of Zinc is given as a hypnotic in doses of 5 grains.

3897.

Zinci Carbonas Præcipitatus.*Precipitated Carbonate of Zinc.*

Impure Carbonate of Zinc is known as *Calamine*, and is frequently directed in older pharmaceutical works; but the precipitated salt is now generally used in medicine.

The U. S. P. gives no formula for Precipitated Carbonate of Zinc, but the Br. P. directs:

Sulphate of Zinc, 10 ounces av.

Carbonate of Sodium, 10½ ounces av.

Boiling Distilled Water, a sufficiency.

Dissolve the Carbonate of Sodium in a pint of the Water in a capacious porcelain vessel and pour into it a solution of the Sulphate of Zinc, in 20 fl.ounces of the Water, stirring diligently; boil for 15 minutes after effervescence has ceased and let the precipitate subside, decant the supernatant liquid, pour on the precipitate 60 fl.ounces of boiling distilled Water, agitating briskly; let the precipitate again subside and repeat the washing with hot distilled Water until the washings give no

precipitate with Chloride of Barium, then drain and dry the precipitate.

Uses.— This is considerably used externally in the form of ointment and washes, and is the working basis of many other of the Zinc salts. Calamine is used in making ointments and in injections, etc.

3898.

Zinci Chloridum.

Chloride of Zinc.



Commercial Chloride of Zinc is prepared by adding Zinc to Hydrochloric Acid and Water as long as it will dissolve, then evaporating until it will solidify. The pure salt is made by the Br. P. formula as follows:

Granulated Zinc,	16	ounces av.
Hydrochloric Acid,	44	fl.ounces.
Solution of Chlorine, a sufficiency.		
Carbonate of Zinc, <i>q. s.</i> , about	$\frac{1}{2}$	ounce av.
Distilled Water,	20	fl.ounces.

Put the Zinc into a porcelain basin, add by degrees the Hydrochloric Acid, previously mixed with the Water, and aid the action by gently warming on a sand-bath until gas is no longer evolved, boil for half an hour, supplying the Water lost by evaporation, and allow to stand on a cool part of the sandbath for 24 hours, stirring frequently.

The liquid is then tested for iron or lead, which are removed, if present, by the Solution of Chlorine and the Carbonate of Zinc. It is then filtered and evaporated to a liquid which solidifies when cold, and moulded, granulated, or otherwise put up for convenient use.

For many purposes it is unnecessary to make a chemically pure salt as above directed. Ordinary Chloride of Zinc may be made by dissolving Zinc to saturation in Hydrochloric Acid and evaporating the solution to dryness.

Uses.— Chloride of Zinc is considerably used as an antiseptic and disinfectant. It is also employed as an escharotic, and is a favorite application to warts, excrescences, etc.

3899.

Zinci Iodidum.*Iodide of Zinc.*

This may be prepared by digesting granulated Zinc in excess with Iodine diffused in Water in a manner similar as is directed for making Iodide of Iron. (See page 506.)

Uses.—This is given as an alterative in doses of $\frac{1}{2}$ to 2 grains.

3900.

Zinci Oxidum.*Oxide of Zinc.*

The Br. P. directs to place Carbonate of Zinc, 6 ounces, in a loosely-covered Hessian Crucible and expose it to a dull red heat until a portion, taken from the centre of the contents of the crucible and cooled, no longer effervesces when moistened with Water and dropped into diluted Sulphuric Acid. The Carbonic Acid and Water are expelled by the heat.

Uses.—Commercial Oxide of Zinc is extensively used for a paint base and for many industrial purposes. *Pure* Oxide of Zinc is used extensively in powder and in the form of Ointment. It is also an ingredient in face powders, liquid cosmetics, etc.

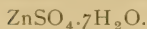
3901.

Zinci Phosphidum.*Phosphide of Zinc.*

This may be made by fusing Zinc in a properly constructed apparatus and passing over the melted mass vapors of Phosphorus in a current of dry Hydrogen until the Zinc is converted into a Phosphide. It is only made by manufacturing chemists.

Uses.—Phosphide of Zinc is a nerve stimulant and aphrodisiac, largely given for nervous debility and loss of vital power. It is safer and less irritating than Phosphorus. The dose is from $\frac{1}{20}$ to $\frac{1}{8}$ grain in powder or in pills.

3902.

Zinci Sulphas.*Sulphate of Zinc.*

The U. S. P. gives no formula for preparing this salt, but the Br. P. directs as follows :

Granulated Zinc, 16 ounces av.

Sulphuric Acid, 12 fl.ounces.

Distilled Water, 80 fl.ounces.

Solution of Chlorine, a sufficiency.

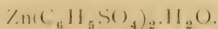
Carbonate of Zinc, $\frac{1}{2}$ ounce av., or a sufficiency.

Pour the Sulphuric Acid, previously mixed with Water, on the Zinc contained in a porcelain basin, and when effervescence has nearly ceased aid the action by heat.

A few drops of the liquid may then be tested for Iron by adding excess of Ammonia and then Sulphydrate of Ammonium, when a black precipitate will be produced if Iron is present. For commercial Sulphate of Zinc it is unnecessary to remove it, but if a pure salt is desired the solution may be freed from it by adding the Solution of Chlorine until the liquid acquires a permanent odor of Chlorine, then add, with continued agitation, the Carbonate of Zinc until a brown precipitate appears and all the Iron is precipitated, then filter, evaporate until a pellicle forms on the surface and crystallizes.

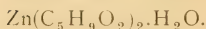
Uses.—Sulphate of Zinc is an astringent and tonic much used for injections, eye-water, washes, etc., and internally as an astringent in doses of 1 to 2 grains, and as an emetic in doses of 10 to 30 grains.

3903.

Zinci Sulphocarbolas.*Sulphocarbonate of Zinc.*

This salt is official in the Br. and G. P., and may be made by heating a mixture of Carbolic Acid and Sulphuric Acid, saturating the product with Oxide of Zinc, evaporating and crystallizing.

Uses.—It is used as an astringent and antiseptic, chiefly for lotions, injections, etc.

3904. Zinci Valerianas.*Valerianate of Zinc.*

This is official in the U. S. or Br. P., the formula in the latter being as follows:

Sulphate of Zinc, 5½ ounces av.

Valerianate of Sodium, 5 ounces.

Distilled Water, a sufficiency.

Dissolve the Sulphate of Zinc and the Valerianate of Sodium, each separately, in 40 fl.ounces of Water, heat both the solutions to near the boiling point, mix them, cool, and skim off the crystals which are produced, evaporate the mother liquor, at a temperature not exceeding 200° F., till it is reduced to 4 fl.ounces, cool again, remove the crystals which form, and add to those before obtained, drain on filter paper, wash with a little cold distilled Water, drain and dry.

Uses.— This salt is used as a nervine and antispasmodic in doses of 1 to 3 grains.

3905. Zincum Granulatum.*Granulated Zinc.*

The Br. P. directs this to be made from Zinc of commerce, 1 pound, by heating it in an earthen crucible, and immediately, when the metal is fused, remove the crucible from the fire and pour the fluid in a thin stream into a vessel containing about 2 gallons of cold Water. Drain off the Water and dry the granulated Zinc.

This is the most convenient form for metallic Zinc to be used for pharmaceutical purposes.

Other Salts of Zinc.

Besides the foregoing salts of Zinc, which are official in the leading pharmacopœias, a few others are occasionally used, and are here mentioned.

3906. Cyanide of Zinc— $\text{Zn}(\text{CN})_2$.— Prepared by adding Hydrocyanic Acid to Solution of Acetate of Zinc and collecting the precipitate. This is used as a nervous sedative in doses of ⅓ to ½ grain.

3907. Cyanide of Zinc and Potassium.— By dissolving Cyanide of Zinc in a solution of pure Cyanide of Potassium, concentrating, and crystallizing.

3908. Ferrocyanide of Zinc — $\text{Zn}_4(\text{C}_3\text{N}_3)_4\text{Fe}_2$.— By mixing Solutions of Sulphate of Zinc and Ferrocyanide of Potassium, collecting and washing the precipitate.

3909. Lactate of Zinc — $\text{Zn}(\text{C}_3\text{H}_5\text{O}_3)_2 \cdot 3\text{H}_2\text{O}$.— By dissolving Carbonate of Zinc to saturation in diluted Lactic Acid, concentrating and crystallizing.

3910. Salicylate of Zinc — $\text{Zn}(\text{C}_7\text{H}_5\text{O}_3)_2 \cdot 3\text{H}_2\text{O}$.— By heating Salicylic Acid with distilled Water and gradually adding Oxide of Zinc, suspended in Water, until no more will dissolve, then filtering, concentrating, and crystallizing.

3911. Tartrate of Zinc.— This may be prepared by mixing hot concentrated Solutions of Sulphate of Zinc and Neutral Tartrate of Potassium, collecting the precipitate and drying.

3912. Zinc-Ethyl, etc.—Zinc also combines with the organic bases forming liquid salts, which take fire spontaneously when exposed to the air. *Zinc-Ethyl*, *Zinc-Methyl* and *Zinc-Amyl* are examples of these substances, but they have no use except as chemical curiosities.

THE foregoing formulas, comprising Part III. of this volume, include most of the preparations, official and unofficial, which are known or required in the regular practice of pharmacy in this country. The pages which follow will be devoted to the consideration of special lines of preparations, which, though not *essential* to the practice of pharmacy, are closely connected with its interests.

PART IV.

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THE STANDARD REMEDIES AND PROPRIETARY MEDICINES.

The following formulas are designed for making a complete line of Standard Proprietary Remedies, which may be prepared and put up by druggists, or others, for local trade or for the market.

It is well known to all who are conversant with the business that the making of Proprietary or "Patent" Medicines requires no knowledge nor facilities which are not ready at hand or readily obtainable by the average druggist.

With reliable formulas and outfits of wrappers, cartoons, and labels, which may now be had specially designed for the purpose,* druggists may prepare and put up a line of Proprietary medicines or articles, such as they may select, with but a slight outlay and with an abundant reward in the way of profits.

It is needless to urge the advantages to druggists of putting up and furnishing, as far as is possible, their own "Patent" Medicines in place of manufacturers. The profit of several hundred per cent., the reputation which naturally comes of putting before the people their own preparations, the constantly increasing trade in this line, and the satisfaction of furnishing reliable articles *worth* the money, should be inducement enough for any enterprising druggist to make the attempt to run a line of his own preparations.

The formulas which follow in this department are mainly original, and intended to make preparations similar to those which have been best received or which possess the greatest merit. They are not, however, given as the exact formulas of particular proprietary preparations now in the market or made by any particular manufacturer.

* For further information on this subject, address the author.

Some formulas, not original, for old and well-known preparations, are also given as selected from the best authorities. Besides the formulas given in this section, many others that may be put up as proprietary remedies are given in various departments of this work, and may be found by referring to the index.

3913.

Acid Phosphate.*Nerve and System Vitalizer.*

A proprietary preparation known as *Horsford's Acid Phosphate*, put up by the Rumford Chemical Works, Providence, R. I., has had a large sale in this country. The title "Acid Phosphate" is claimed by them as a trade mark. Several formulas for Acid Phosphate have been given in the preceding pages (577, 753), but for convenient reference formulas are also given in this department.

Solution Phosphate Compound, concentrated (1938), 1 pint.

Water, 4 pints.

Mix them and, after standing, filter. This corresponds very nearly with the supposed composition of the preparation above named, which is said to contain in each fl. drachm 3 grains Phosphate of Calcium, $\frac{1}{2}$ grain Phosphate of Iron, $\frac{1}{2}$ grain Phosphate of Magnesium, $\frac{1}{3}$ grain Phosphate of Potassium, with excess of Phosphoric Acid.

Liquor Acidi Phosphorici Comp. (with Iron), which is put up by manufacturing pharmacists, is of about the same composition.

The dose of this preparation is from $\frac{1}{2}$ to 1 teaspoonful in sweetened water after each meal and before retiring.

It is also extensively used at the soda fountain, making an agreeable acid addition to fruit syrups, etc.

AGUE CURES.

The Proprietary Remedies for Ague which are found on the market consist of syrups, solutions or tinctures, mixtures and pills. They are given for chills and fevers, ague, neuralgia, malaria, etc. The syrups are the most palatable of any of the Ague Cures, but are less effective than the stronger remedies prepared in the form of tinctures, mixtures and pills. All Ague Cures depend for their value upon the proper combination of antiperiodics and alteratives, both being essential, the former to "break" the chills, and the latter to stimulate the organs to throw off the diseased matter with which they have become loaded. The following are representative of the

different varieties of Ague Preparations which are found in the market :

3914.

Ague Cure or Syrup.*For Chills, Fever and Malaria.*

Sulphate of Quinine,	128 grains.
Sulphate of Cinchonidine,	128 grains.
Diluted Sulphuric Acid, q. s., about	3 fl.drachms.
Alcohol,	2 fl.ounces.
Oil of Wintergreen,	10 minims.
Fluid Extract of Sarsaparilla Compound,	2 fl.ounces.
Water,	5 fl.ounces.
Sugar,	14 ounces av.

Mix the Sulphates with the Water, add sufficient of the acid to dissolve them. Add the Oil of Wintergreen to the Alcohol and add the solution to the solution of the Cinchona Salts. Then add the Fluid Extract of Sarsaparilla, mix them thoroughly, and after standing a few days, filter and dissolve the Sugar in the filtrate by agitation.

A fl.drachm contains 2 grains of Cinchona Salts. The dose is a teaspoonful to a tablespoonful for ague and chills.

3915.

Ague Remedy or Tincture.*For Chills, Fever and Malaria.*

Purified Chinoidin,	1 ounce av.
Extract of Liquorice in powder,	½ ounce av.
Fluid Extract of Podophyllum,	1 fl.ounce.
Fluid Extract of Leptandra,	1 fl.ounce.
Alcohol,	10 fl.ounces.
Oil of Eucalyptus,	2 fl. drachms.

Water sufficient to make a pint.

Dissolve the Chinoidin, and Oil of Eucalyptus, in the Alcohol mixed with the Fluid Extracts, by maceration. Dissolve the Liquorice Extract in 3 fl.ounces of Water by the aid of heat, and add to the solution of Chinoidin, etc., add enough Water to make a pint, and, after standing a few days, filter.

This is a dark colored, very strong and bitter preparation, acting as a cholagogue and antiperiodic. It is very effective.

A lighter colored, more pleasant preparation may be made by using 1 ounce of Quinine Sulphate instead of the Chinoidin.

The dose is from a teaspoonful to a tablespoonful.

3916. Ague Mixture or Cholagogue.

This mixture is similar to several preparations on the market known as Cholagogues. It is an unsightly compound, as it contains quite a precipitate, but is very effective.

Sulphate of Quinine,	½ ounce av.
Sulphate of Cinchonidine,	½ ounce av.
Fluid Extract of Stillingia,	3 fl.ounces.
Fluid Extract Leptandra,	1 fl.ounce.
Fluid Extract Podophyllum,	½ fl.ounce.
Fowler's Solution of Arsenic,	¼ fl.ounce.
Oil of Wintergreen,	1 fl.drachm.
Syrup, sufficient to make	1 pint.

Rub the Sulphates with the Fluid Extracts, add the Oil and then mix thoroughly with the Syrup and Solution of Arsenic.

A fl.drachm contains about $3\frac{1}{2}$ grains of the Cinchona Salts.

The dose is ½ teaspoonful to a dessertspoonful, for chills.

This is similar to the proprietary *Osgood's Indian Cholagogue*, which has been a popular ague cure for nearly half a century.

3917. Ague and Neuralgia Pills.

Chinoidin, purified,	150 grains.
Podophyllum Resin (Podophyllin),	5 grains.
Leptandrin,	10 grains.
Capsicum, in powder,	20 grains.

Mix the ingredients thoroughly and make 100 pills.

The dose for children is 1 or 2 pills, for adults 2 to 4 pills, every 3 hours between chills.

3918. Ague and Neuralgia Pills.

Sulphate of Quinine,	50 grains.
Sulphate of Cinchonidine,	50 grains.
Arsenious Acid,	2 grains.
Sulphate of Strychnine,	½ grain.
Podophyllum Resin (Podophyllin),	20 grains.
Leptandrin,	60 grains.
Extract of Dandelion, q. s. to make a mass.	

Mix thoroughly and make into 100 pills. The dose for children is 1 to 2 pills, for adults 2 to 4 pills.

ALTERATIVES.

Although most of the Blood Purifiers and Sarsaparillas on the market are also known as Alteratives, a few preparations which are supposed to have an especially alterative action on the various organs of secretion are known particularly as *Alteratives*. The following are representative of this class of preparations :

3919.

Alterative Compound.

Blood and Liver Syrup.

Stillingia, in No. 40 powder,	8	ounces av.
Sarsaparilla, in No. 30 powder,	8	ounces av.
Burdock Root, in No. 30 powder,	3	ounces av.
Blue Flag Root, in No. 20 powder,	1½	ounce av.
Mandrake, in No. 50 powder,	1½	ounce av.
Senna, in No. 20 powder,	1½	ounce av.
Prickly-Ash Bark, in No. 50 powder,	¾	ounce av.
Sarsaparilla Flavoring,	½	ounce av.
Diluted Alcohol,	4	pints.
Sugar,	5	pounds av.
Water, a sufficient quantity.		

Mix the drugs, moisten them with 2 pints of diluted Alcohol and macerate in a covered vessel in a warm place for 24 hours, transfer to the water-bath percolator, pack moderately, pour upon them 2 pints of diluted Alcohol and set in a warm place for one day ; then heat moderately and, after one hour, begin to percolate slowly, adding Water to the drugs after the liquid has ceased to drop, and continuing the heat and percolation until 5½ pints have passed. To this add the Sarsaparilla Flavoring and, after standing a few days, filter, adding through the filter enough Water to make 5½ pints, then dissolve the Sugar in the filtrate by agitation and add, if necessary, Water sufficient to make 1 gallon of the preparation. One ounce Iodide of Potassium may be added if desired.

This is an excellent alterative compound, which may be put up under many names — as Blood Purifier, Sarsaparilla Alterative, Medical Discovery, etc.

The dose is from 1 to 2 teaspoonfuls, three times a day.

Many other formulas of similar composition will be found under other headings throughout this work. This preparation may be put up under the title designated in the heading, or under other names, as Sarsaparilla Compound, Blood Purifier, or other similar titles.

3920.

Alterative Extract or Juice.(*"Succus Alterans."*)

The original formula for this preparation was introduced by Geo. W. McDade, M. D., of Montgomery, Ala., who obtained it from the Creek Indians. (?) It is claimed to be prepared from the fresh green medicinal plants, each pint bottle containing the "unimpaired" virtues of 16 troyounces of the true medicinal plants *Stillingia Sylvatica*, *Smilax Sarsaparilla*, *Phytolacca Decandra*, *Lappa Minor*, and *Xanthoxylum Carolinianum*. It is furnished to the trade by Eli Lilly & Co., of Indianapolis, Ind.

It is, of course, impracticable for druggists to obtain the fresh plants, which are claimed to compose the original article; but a good *Alterative Extract* may be made from the following formula, the ingredients of which are mentioned in the McDade prescription:

Stillingia Root,	24 ounces av.
Sarsaparilla Root,	24 ounces av.
Poke Root,	8 ounces av.
Burdock Root,	16 ounces av.
Southern Prickly-Ash Bark,	4 ounces av.
Alcohol,	6 pints.
Glycerin,	1 pint.
Water, sufficient to make	1 gallon.

Grind the drugs to a coarse powder, moisten them with 3 pints of Alcohol mixed with 2 pints of Water and macerate for 24 hours in a covered vessel, then transfer to a water-bath percolator, pack firmly, pour on the remainder of the Alcohol (3 pints) mixed with 3 pints of Water, and set in a warm place for one day; then heat moderately and, after one hour, begin to percolate, adding Water to the drugs, and continuing the heat and percolation until 7 pints of percolate are obtained. Continue the percolation with Water until 4 pints more have passed, evaporate this to a soft extract, add to it the Glycerin and the 7 pints of percolate previously obtained and, after standing a few days, filter.

The dose is a teaspoonful to a dessertspoonful, three times a day.

ANODYNES.

Two kinds of Anodyne preparations may be made and put up as proprietary medicines. Those containing Ether, like Hoffman's Anodyne, which do not have a bad after effect, and those containing

Opium, Morphine, or Chloral, which, though effective, are unsafe preparations to introduce. The term Anodyne is also used in connection with many other preparations, as "Tolu Anodyne" for coughs, "Clove Anodyne" for toothache, etc., but these will be found under other headings.

Formulas are only given for the ethereal and harmless Anodynes. If desired, the formulas for others will be found under other departments. See preparations of Opium, Chloral, Cocaine, etc.

3921. **Golden Anodyne Tincture.**

A preparation similar to Hoffman's Anodyne, of a yellow or golden color; is considerably in demand among the Germans, under the name "Golden Tincture." Various formulas have been given for preparing it, the following being as satisfactory as any :

Ether, Sulphuric,	1 ounce.
Alcohol,	2 ounces.
Tincture Tumeric, sufficient to color.	

Or it may be colored with Fustic Wood, by maceration.

This is in effect the same as Hoffman's Anodyne, but is more attractive. The dose is 10 to 60 minims, for pain, cramp, etc.

Another formula is Ether 1 ounce, Laudanum 1 ounce, Chloroform $\frac{1}{4}$ ounce, Alcohol 1 ounce, colored with Tincture Turmeric.

3922. **Anodyne Elixir.**

Pain-Soothing Cordial, without Opium or Choral.

An Anodyne without Opium or Chloral is desirable and valuable, yet there is no such preparation found in the market. The following is recommended to those who desire to put up such a preparation. It is effective and at the same time harmless :

Bromide of Potassium,	2 ounces av.
Sugar,	5 ounces av.
Ether (Sulphuric),	1 fl.ounce.
Alcohol,	2 fl.ounces.
Tincture of Hyoscyamus,	3 fl.ounces.
Elixir,	3 fl.ounces.
Water,	4 fl.ounces.

Dissolve the Bromide of Potassium and the Sugar in the Water, mix the Ether with the Alcohol, add the Tincture of Hyoscyamus, then the Elixir and, having mixed them, add the Solution of

Bromide of Potassium and Sugar to the mixture and mix them thoroughly.

A fl.drachm contains about 7 grains Bromide of Potassium, 4 minims of Ether, and 12 minims of Tincture of Hyoscyamus. It may be given in doses of a teaspoonful to a dessertspoonful, every hour, or, in severe cases of colic, cholera morbus, etc., a teaspoonful every 15 minutes until relieved.

As the Ether in this preparation, although adding much to its effectiveness, is rather disagreeable, its place may be supplied with $1\frac{1}{2}$ fl.drachms of Chloroform, or it may be omitted altogether.

Other Anodyne preparations will be found under other headings, as Chlorodyne, Sedatives, Nervines, etc., etc.

ASTHMA REMEDIES.

The Asthma Remedies which are put up as Proprietary are in various forms, as powders and pastilles for burning slowly, the smoke being inhaled, cigarettes for smoking, remedies to take, and inhalants. The design of most of them is to produce diaphoresis and expectoration as well as to subdue the spasmodic action of the inflamed bronchial organs. The following formulas make preparations representative of the various remedies:

3923.

Asthma Remedy.

A Powder for Fumigation.

Grindelia Robusta, in fine powder,	8 ounces.
Jaborandi Leaves, in fine powder,	8 ounces.
Eucalyptus Leaves, in fine powder,	4 ounces.
Coca Leaves, in fine powder,	4 ounces.
Digitalis Leaves, in fine powder,	4 ounces.
Cubeb, in fine powder,	4 ounces.
Stramonium Leaves, in fine powder,	16 ounces.
Nitrate of Potassium, in fine powder,	12 ounces.
Cascarilla Bark,	1 ounce.

Mix the powders and dry them thoroughly before putting up. This is used by burning a half teaspoonful or more on a piece of saltpetre paper and inhaling the smoke which rises. It affords prompt relief and will cure cases not too far advanced. It is also excellent for catarrh, hay-fever, and other troubles of the nasal passages, throat, and lungs.

3924.

Asthma Cure.*A Liquid to Take.*

Fluid Extract Grindelia,	3 fl.ounces.
Fluid Extract Skunk Cabbage,	1 fl.ounce.
Fluid Extract Lobelia,	1 fl.ounce.
Fluid Extract Bloodroot,	2 fl.drachms.
Fluid Extract Senega,	2 fl.drachms.
Chloroform,	4 fl.drachms.
Alcohol,	20 fl.ounces.
Water,	6 fl.ounces.

Mix them thoroughly and, after standing, decant or filter.

This may also be prepared from the drugs Grindelia 3 ounces, Skunk Cabbage, Lobelia, each 1 ounce, Senega and Bloodroot, each 2 drachms, percolated with a mixture of 4 measures of Alcohol with 1 measure of Water, sufficient to make 2 pints, and Chloroform 1 fl.ounce, added to the tincture.

The dose is a teaspoonful, in sweetened water, every 15 to 30 minutes, when the attack of asthma comes on, until relieved. It should also be continued, in small doses, three times a day to effect a cure.

3925.

Asthma Relief.*To take for Asthma, Hay Fever, etc.*

Nitrite of Amyl,	2 fl.drachms.
Iodide of Potassium,	1 ounce av.
Elixir,	1 pint.

Mix and dissolve. The dose is a teaspoonful for Asthma, at the first indications of the paroxysm, repeated every 20 or 30 minutes until relieved. For Hay Fever, Influenza, etc., a teaspoonful every 3 or 4 hours.

3926.

Asthma Inhalant.*To be used by Inhalation.*

Nitrite of Amyl,	2 fl.drachms.
Essential Oil of Mustard,	10 drops.
Ether, Sulphuric,	½ fl.ounce.
Alcohol,	4 fl.ounces.

Mix them. Put a few drops of the liquid upon some cotton or sponge, hold in the hand and inhale the vapor. It is still better to

put the cotton loosely in a glass tube or homeopathic bottle with the bottom out and inhale by drawing the air through the tube. This gives immediate relief. Other forms of inhalers may be used.

3927. **Asthma Pastilles.**

Benzoin, in fine powder,	1 ounces av.
Jaborandi, in fine powder,	2 ounces av.
Stramonium Leaves, in fine powder,	4 ounces.
Nitrate of Potassium, in fine powder,	4 ounces.
Charcoal,	20 ounces.
Mucilage of Tragacanth, thin, sufficient.	

Beat the powders with the mucilage to a stiff mass and roll out into a cake about $\frac{1}{4}$ inch thick, cut this into strips $\frac{3}{8}$ inches wide and $1\frac{1}{2}$ inches long and dry by warm air.

One end of the pastil is ignited and the smoke inhaled until relieved.

3928. **Asthmatic Cigarettes.**

Stramonium Leaves,	4 ounces.
Cascarilla Bark,	$\frac{1}{2}$ ounce.
Lobelia Leaves,	2 drachms.
Mullein Leaves,	4 ounces.

Cut the leaves and drugs fine like smoking tobacco and make into cigarettes. This may also be smoked in a pipe.

BALMS OR PANACEAS.

In proprietary medicines Balms are remedies intended for internal or external use, and designed to allay pain, colic, cholera morbus, inflammation, etc. The following will be found satisfactory and similar in composition to those most popular in the market, known as Magic Balms, Pain Killers, Ready Reliefs, Magic Oils, etc. They are as a class hot, stimulating preparations, increasing the action of the parts with which they come in contact, or acting as counter-irritants, and thus, on the Indian principle, frightening away the disease. They are sold as general panaceas for pain, etc. Many other similar preparations for external and internal use will be found among the Liniments and under other headings. The sale for this class of preparations as proprietary medicines is as large as of nearly any other class, and they may readily be prepared by druggists, affording a good profit.

3929. Eucalyptus Balm.

Oil of Eucalyptus,	1 fl.ounce.
Oil of Cloves,	$\frac{1}{4}$ fl.ounce.
Oil of Hemlock,	$\frac{1}{2}$ fl.ounce.
Capsicum,	$\frac{1}{2}$ ounce av.
Camphor,	$\frac{1}{2}$ ounce av.
Alcohol,	1 pint.

Mix them, macerate for a week or ten days, agitating occasionally, and filter.

3930. Magic Balm.

Oil of Sassafras,	1 fl.ounce.
Oil of Cloves,	$\frac{1}{4}$ fl.ounce.
Oil of Hemlock,	$\frac{1}{2}$ fl.ounce.
Chloroform,	$\frac{1}{8}$ fl.ounce.
Ether,	$\frac{1}{2}$ fl.ounce.
Capsicum,	$\frac{1}{2}$ ounce av.
Camphor,	$\frac{1}{2}$ ounce av.
Water of Ammonia,	$\frac{1}{2}$ fl.ounce.
Alcohol,	1 pint.

Mix them. Macerate for a week or ten days, agitating frequently and filter.

3931. Magnetic Balm.

Oil of Sassafras,	1 fl.ounce.
Oil of Peppermint,	$\frac{1}{4}$ fl.ounce.
Oil of Hemlock,	1 fl.ounce.
Capsicum,	$\frac{1}{2}$ ounce av.
Camphor,	$\frac{1}{2}$ ounce av.
Alcohol,	1 pint.

Mix them. Macerate for a week or ten days, agitating frequently and filter.

3932. Pain Cure Balm or "Pain Killer."

Guaiac Resin,	1 ounce av.
Capsicum,	$\frac{1}{2}$ ounce av.
Camphor,	$\frac{1}{8}$ ounce av.
Opium, in powder,	60 grains.
Water of Ammonia,	$\frac{1}{4}$ fl.ounce.
Alcohol,	1 pint.

Mix them. Macerate for a week or ten days and filter. This is similar to some of the Pain Killers.

The preparation known as No. 6, or Tincture of Myrrh and Capsicum (3646), is often put up as a Pain Killer.

3933. Ready Balm or "Ready Relief."

Camphor,	$\frac{1}{2}$ ounce av.
Capsicum,	$\frac{1}{2}$ ounce av.
Oil of Turpentine,	$\frac{1}{4}$ fl.ounce.
Water of Ammonia, U. S. P.,	5 fl.ounces.
Alcohol,	12 fl.ounces.

Dissolve the Camphor and Oil of Turpentine in the Alcohol, add the Capsicum and Ammonia, and after standing a week or ten days, filter rapidly. This is similar to Ready Relief. It should be given internally only in small doses, 10 to 20 minims.

3934. Wizard Balm.

Oil of Cajuput,	$\frac{1}{4}$ fl.ounce.
Oil of Sassafras,	1 fl.ounce.
Oil of Hemlock,	$\frac{1}{4}$ fl.ounce.
Oil of Origanum,	$\frac{1}{4}$ fl.ounce.
Oil of Cedar,	$\frac{1}{8}$ fl.ounce.
Capsicum,	$\frac{1}{4}$ ounce av.
Camphor,	$\frac{1}{4}$ ounce av.
Chloroform,	$\frac{1}{4}$ fl.ounce.
Alcohol,	1 pint.

Mix them. Macerate for a week and filter.

BALSAMS.

Many proprietary preparations, called "Balsams," are classed with other remedies, as "Cough Balsam" or "Lung Balsam," among the cough remedies; "Carminative Balsam," "Diarrhœa Balsam," etc., under cholera cures, etc.

Others are included under other headings throughout the book. The few remaining unclassified, and known more particularly as Balsams, because they resemble the liquid Balsams, are noted in this department.

Several Balsams, also, which are put up as proprietary remedies, will be found on pages 183 to 186, which see.

3935. Anodyne Balsam.

Castile Soap,	1 ounce.
Opium Tincture,	3 ounces.
Camphor,	3 drachms.
Alcohol,	10 ounces.

Cut the soap in fine pieces and digest, by gentle heat, with the Tincture of Opium and Alcohol until dissolved, then add the Camphor, dissolve and filter.

This is for external use for swellings, pain, etc.

3936. Canker Balsam.

Marsh Rosemary Root, in coarse powder,	4 ounces av.
Borax, in powder,	1 ounce av.
Glycerin,	6 ounces av.
Alcohol,	12 fl.ounces.
Water, a sufficient quantity.	

Mix Alcohol and Water, equal measures, and percolate the Marsh Rosemary Root with the liquid until it ceases to drop, then add sufficient Water through the percolator to make 27 fl.ounces of the percolate, dissolve the Borax in the liquid, add the Glycerin, and filter if necessary.

This is an astringent liquid, useful as a gargle for sore throat, a mouth wash, etc., and as an application for cracked nipples or other similar sores.

3937. Caustic Balsam.

A preparation known as *Gombault's Caustic Balsam* has had an extensive sale for veterinary use, etc. The following formula makes a preparation quite similar to the proprietary article :

Sulphuric Acid (by weight),	1 ounce av.
Oil of Turpentine,	6 fl.ounces.
Croton Oil,	1 fl.ounce.
Corrosive Sublimate,	60 grains.
Camphor,	$\frac{1}{2}$ ounce.
Cotton Seed Oil,	8 fl.ounces.

Mix the Oils of Turpentine and Croton, add the Corrosive Sublimate, in fine powder, and the Camphor, and dissolve ; then add, a little at a time, the Sulphuric Acid, taking care that the mixture does not become too hot, and, when all has been added and the mixture has become cool, add the Cotton Seed Oil, and mix them thoroughly.

This is used for sprains, ringbones, strains, swellings, puffs, etc.

3938. Locatelle's Balsam.

Yellow Wax,	4 ounces.
Olive Oil,	1 pound.
Venice Turpentine,	1 pound.
Alkanet Root,	2 ounces.

Steep the Alkanet Root for several days in the Olive Oil and strain, melt the Wax, add the Oil and the Turpentine and mix them well together.

This is used as a pectoral in doses of $\frac{1}{2}$ to 1 teaspoonful.

3939. Thibault's Balsam.

Myrrh, Aloes, and Dragon's Blood, each . . .	1 drachm.
St. John's Wort Flowers,	1 ounce.
Spirit of Wine (Alcohol),	10 ounces.
Canada Balsam,	$\frac{1}{2}$ ounce.

Digest the Flowers in the Spirit for three days, then express the liquor and dissolve in it the other ingredients and, after standing, filter.

This is used as a healing Balsam for wounds, cuts, etc., and is given as a diuretic and for kidney and bladder troubles, gonorrhœa, etc., in doses of a teaspoonful or more.

3940. Turlington's Balsam.

Benzoin,	12 ounces.
Storax (liquid),	4 ounces.
Balsam Peru,	2 ounces.
Myrrh,	1 ounce.
Aloes,	1 ounce.
Balsam Tolu,	4 ounces.
Extract Liquorice,	4 ounces.
Angelica Root,	$\frac{1}{2}$ ounce.
Alcohol,	1 gallon.

Reduce the gums to a coarse powder and macerate all together with the Spirit for two weeks, with agitation, then filter.

This has been a popular panacea for internal and external use.

3941. Vegetable Healing Balsam.

White Resin,	1 pound av.
Oil of Turpentine,	1 pint.

Melt the Resin, remove it from the fire and add the Oil of Turpentine, mixing them well together.

This is similar to *Peckham's Balsam*, as it is now put up and sold, as a proprietary medicine. It is used for coughs and colds, also for kidney and bladder troubles, in doses of 3 to 10 minims or more. It is also used externally on sores, wounds, swellings, etc.

The following is said to be the formula from which this Balsam was formerly prepared: Pale Resin 3 pounds, melted and strained; then add Oil of Turpentine 2 pints, Balsam of Tolu 1 ounce, Balsam of Fir 4 ounces, Oil of Hemlock, Oil of Origanum, Venice Turpentine, each 1 ounce, Strained Honey 4 ounces. Mix well together.

Similar "Vegetable Healing Balsams" are also prepared by others and sold under similar names.

The following formulas may be used:

Burgundy Pitch,	1 $\frac{1}{4}$ pound av.
Oil of Turpentine,	1 pint.

Melt the Pitch, remove from the fire and gradually add the Oil of Turpentine, mixing them well together.

Resin,	1 pound.
Venice Turpentine,	1 pound.
Oil of Turpentine,	1 pint.

Melt the Resin, add the Venice Turpentine, warm together and add the Oil of Turpentine while cooling.

Resin,	1 pound.
Balsam Fir,	$\frac{1}{2}$ pound.
Venice Turpentine,	$\frac{1}{2}$ pound.
Oil of Turpentine,	1 pint.

Melt the Resin, add the Balsam Fir and Venice Turpentine, warm together, and when cooling, add the Oil of Turpentine, mixing them well together.

BITTERS.

A great variety of Bitters are sold under various names as proprietary medicines. They are designed for various uses, and may naturally be divided into three classes, as follows:

Class A.

These Bitters are weakly medicinal preparations designed to be taken in large doses, and depend for their effect more upon the liquor which they contain than the other medicinal ingredients.

They are stimulating Bitters, and are to a great extent substitutes for liquors, although if properly used are very beneficial for disordered digestion, dyspepsia, malaria, etc. The most popular Bitters of this class found in the market are known as Hostetter's, Drake's, Wahoo, Niagara, etc. The following formulas make good preparations of this kind. Other formulas will be found on pages 436 to 439.

3742.**Stomach Bitters.**

Bitter Orange Peel,	2 drachms.
Wahoo Bark,	2 drachms.
Sweet Flag Root,	1 drachm.
Cinnamon Bark,	1 drachm.
Cloves,	10 grains.
Coriander,	30 grains.
Whisky,	6 pints.
Sugar,	2 ounces
Water,	2 pints.

Reduce the drugs to a coarse powder and macerate with the Whisky and Water for several days, until the strength is obtained, then filter. If desired, Cologne Spirit (Alcohol proof) may be diluted with an equal quantity of Water and used instead of Whisky.

The dose is from half to a wineglassful or more.

3943.**Hop Bitters. ***

Hops, in coarse powder,	3 ounces av.
Buchu, in coarse powder,	1 ounce av.
Dandelion Root, in coarse powder,	1 ounce av.
Mandrake Root, in coarse powder,	80 grains.
Bitter Orange Peel, in coarse powder,	2 drachms.
Wahoo Bark,	1 drachm.
Whisky,	5 pints.
Water, q. s., or	3½ pints.

Mix the Whisky with 3 pints of Water and macerate the drugs with the mixture for several days, then filter and add through the filter enough Water to make the measure a gallon.

The dose is a tablespoonful to a wineglassful or more.

This is much stronger of the medicinal ingredients than the proprietary Hop Bitters. It may be reduced with diluted Cologne Spirit.

3944.

Wahoo Bitters.

Wahoo Bark, in coarse powder,	$\frac{1}{2}$ ounce.
Sweet Flag Root, in coarse powder,	$\frac{1}{4}$ ounce.
Cinnamon Bark, in coarse powder,	1 drachm.
Cardamom Seed, in coarse powder,	20 grains.
Oil of Orange (fresh),	10 drops.
Whisky,	6 pints.
Water,	2 pints.
Glycerin,	1 ounce.

Mix and macerate for several days, then filter.

Dose, from half to a wineglassful or more.

Other Bitters of this class may be made in the same general way by using other bitter drugs, other liquors or other flavoring ingredients.

3945.

Plantation Bitters.

Wild Ginger Root,	$\frac{1}{2}$ ounce.
Bitter Orange Peel,	1 ounce.
Dandelion Root,	1 ounce.
New England Rum,	1 pint.
Whisky,	5 pints.
Sugar,	4 ounces.
Water,	2 pints.

Reduce the drugs to a coarse powder and macerate with the mixed liquids for a few days, then filter.

Bitters — Class B.

This class of Bitters includes those in which iron is combined with bitter tonics, aromatics, etc., in the form of a pleasant cordial. Iron Bitters have, of late, by the reason of extensive advertising, become quite popular, and, although they are nothing new in the line of preparations, they now have a large sale, and, as they may be made at a low cost, are quite profitable to put up. In making these Bitters it is necessary to use tonics and aromatics which do not make an inky color or taste with the iron salts.

3946.

Iron Bitters.*Tonic Health Cordial.*

Wahoo Bark, in coarse powder,	1 ounce av.
Cardamom Seeds, in coarse powder,	2 drachms.
Caraway Seeds, in coarse powder,	2 drachms.

Coriander Seeds, in coarse powder,	2 drachms.
Nutmeg, in coarse powder,	1 drachm.
Oil of Orange, fresh,	1 fl.drachm.
Oil of Cassia (Cinnamon),	10 minims.
Citrate of Iron and Ammonium,	1 ounce av.
Sugar,	1 pound av.
Cologne Spirit (deodorized Alcohol),	2 pints.
Water, sufficient to make	1 gallon.

Mix the powdered drugs and macerate them with the Alcohol, with frequent agitation, for several days, then pour off the liquid, add the oils to the tincture and reserve. Now add 2 pints of Water to the macerated powders, agitate, let stand 12 hours and pour off; repeat with the same quantity of Water, adding the aqueous liquids to the alcoholic solution and mixing them thoroughly; dissolve the Iron salt and the Sugar in enough Water to make, when added to the mixed liquids, 1 gallon of the mixture, and, after standing a few days, filter clear.

This may be made, also, by mixing 1 fl.ounce of Fluid Extract of Wahoo with 3 fl.ounces Compound Tincture of Cardamom and the other ingredients as directed in the formula above.

Other soluble salts of Iron may be used instead of the citrate.

The dose is a dessertspoonful to a wineglassful.

3947. Iron Tonic Bitters.

Sulphate of Quinine,	40 grains.
Sulphate of Cinchonidine,	80 grains.
Citrate of Iron and Ammonium,	512 grains.
Cologne Spirit,	2 pints.
Essence of Calamus,	1 fl.ounce.
Soluble Elixir Flavoring,	6 fl.ounces.
Water,	5½ pints.
Sugar,	½ pound av.

Mix the ingredients, dissolve and filter.

This is similar to Bitter Wine of Iron except that it contains no Wine.

The dose is a dessertspoonful to a wineglassful.

Many other preparations may be put up and sold as "Iron Bitters," or "Iron Tonic Bitters," and by other titles. The Elixirs of Calisaya and Iron, Gentian and Iron, and other tonic Elixirs containing Iron, may be diluted one-half for this purpose with Alcohol 1 part, Syrup 1 part, and Water 2 parts.

3948.

Iron Wine Bitters.

Bitter Wine of Iron is frequently put up and sold as Iron Bitters, but is stronger than most that are put up for general sale. The following makes a good Iron Bitters, using Wine as the menstruum :

Citrate of Iron and Quinine,	1	ounce av.
Essence of Calamus,	1	fl.ounce.
Oil of Cinnamon,	10	minims.
Oil of Orange,	40	minims.
Sugar,	8	ounces av.
Water (hot),	4	fl.ounces.
Alcohol,	1	pint
White Wine (Sherry or Angelica),	6½	pints.

Dissolve the Citrate of Iron and Quinine in the hot Water and add the solution to the Wine, dissolve the Oils in the Alcohol and add the Essence, then mix the solutions, dissolve the Sugar in the mixture and, after standing, filter.

The dose is a dessertspoonful to a wineglassful.

Class C.

In this class the formulas are given for the stronger medicinal Bitters, similar to proprietary Bitters, which have been or are popular. They differ from the other classes of Bitters by being put up in smaller packages, containing more of the medicinal agents and being taken in smaller doses.

3949.

Blood Bitters, or Burdock Bitters.*Tonic System Renovator.*

Burdock Root,	12	ounces av.
Mezereum Bark,	2	ounces av.
Wild Cherry Bark,	2	ounces av.
Senna Leaves,	2	ounces av.
Columbo Root,	1	ounce av.
Sassafras Bark,	2	ounces av.
Liquorice Root,	2	ounces.
Cinnamon,	½	ounce av.
Cloves,	¼	ounce av.
Sugar,	4	ounces.
Alcohol,	4	pints.
Water, a sufficient quantity to make . . .	1	gallon.

Grind the drugs to coarse powder, mix the Alcohol with 3 pints of Water, moisten the powder with a pint of the mixture and macerate,

in a warm place, in a covered vessel for 24 hours; transfer to the water-bath percolator, pour upon it 2 pints of menstruum, pack moderately, and set in a warm place for one day, then heat very moderately and, after one hour, begin to percolate, adding the remainder of the menstruum, and then Water to the drug, and continuing the heat and percolation until a gallon of the Bitters is obtained, dissolve the Sugar in the liquid and filter.

This may be made by cold percolation, but this method does not so thoroughly exhaust the drugs.

The dose is from 1 to 2 teaspoonfuls three or four times a day.

This is similar to, but a better preparation than, several of the Blood Bitters in the market.

3950. German Liver Bitters.

Leptandra (Culver's Root),	8	ounces av.
Mandrake Root,	2	ounces av.
Burdock Root,	6	ounces av.
Liquorice Root,	2	ounces av.
Sassafras Bark,	2	ounces av.
Cinnamon Bark,	$\frac{1}{2}$	ounce av.
Alcohol,	4	pints.
Water, a sufficient quantity.		

Grind the drugs to a coarse powder, mix the Alcohol with 4 pints of Water, moisten the powder with a pint of the menstruum and macerate in a covered vessel for 24 hours; transfer to the water-bath percolator, pack firmly, pour upon it 2 pints of the menstruum and set in a warm place for one day, then heat moderately and, after one hour, begin to percolate, adding the remainder of the menstruum, and then Water to the drugs, and continuing the heat and percolation until a gallon of the Bitters is obtained; filter.

This may be made, also, by cold percolation, but this process does not so thoroughly exhaust the drugs.

The dose is from 1 to 2 teaspoonfuls three or four times a day.

This is similar to the German Bitters and Liver Invigorators that have been popular. The preparation is a good liver and blood remedy.

A great variety of other similar preparations are put up and sold under various names, all of them being intended to act on the liver to increase its secretion of bile, thereby acting as laxative. The sale of this kind of Bitters is much less than it was formerly, but they are, nevertheless, good preparations.

3951. Jaundice or Laxative Bitters.

Cape Aloes, in powder,	2	ounces av.
Carbonate of Potassium (Sal Tartar),	$\frac{1}{2}$	ounce.
Culver's Root, in powder,	2	ounces av.
Cinnamon, in powder,	1	ounce.
Anise, in powder,	1	ounce.
Coriander, in powder,	1	ounce.
Liquorice Root, in powder,	2	ounces.
Alcohol,	2	pints.
Water, a sufficient quantity to make	1	gallon.

Mix the drugs and macerate them with the Alcohol and 6 pints of Water for seven days, then pour off the supernatant liquid, put the drugs in a percolator, pour the liquid upon them and percolate, adding Water through the percolator until a gallon of Bitters is obtained, and filter.

This is similar to several Laxative and Jaundice Bitters on the market, which have had a popular sale.

3952. Poor Man's Bitters.

A class of Bitters made with a small percentage of Alcohol, and put up usually in half-pint bottles, to retail at 25 cents, are known by the above title, and by various other names. They are neither very profitable nor satisfactory proprietary medicines, but may be made, if desired, as follows :

Quassia, ground,	4	ounces.
Orange Peel, ground,	1	ounce.
Cloves, in powder,	$\frac{1}{4}$	ounce.
Cinnamon, in powder,	$\frac{1}{4}$	ounce.
Alcohol,	1 $\frac{1}{2}$	pint.
Water, q. s., about	7	pints.

Mix the powders with the ground drugs and, having mixed the Alcohol with 1 $\frac{1}{2}$ pint of Water, moisten the drugs with 6 fl.ounces of the mixture and pack in the water-bath percolator, pour upon them the remainder of the mixed Alcohol and Water and, after 24 hours, heat moderately for one hour and percolate, adding Water through the percolator to make 1 gallon of the Bitters ; after standing, filter clear.

The dose is a tablespoonful or more.

Mandrake Bitters may be made by adding 2 ounces of Mandrake to the above.

3953.

Vinegar Bitters.

A proprietary medicine known as "Vinegar Bitters" at one time had a large sale, the result of extensive advertising as a "*no vile fancy drink*," and other temperance mottoes. It had the reputation of being a pharmaceutical compound (?) of Aloes and sour Beer.

A Vinegar Bitters of much value, but entirely unlike the preparation mentioned, may be made as follows :

Cascara Sagrada Bark,	6	ounces.
Leptandra Root,	2	ounces.
Mandrake Root,	1	ounce.
Cinnamon,	$\frac{1}{2}$	ounce.
Allspice,	$\frac{1}{2}$	ounce.
Good Wine or Cider Vinegar,	4	pints.
Alcohol,	1	pint.
Water,	4	pints.

Grind the drugs to a coarse powder and infuse them with the Vinegar at a temperature of about 200° F. for four hours, then pour off the liquid, pour the Water upon the dregs, and infuse as before; mix the liquors obtained, add the Alcohol and, after standing, strain.

This is a good laxative and liver regulator.

Other forms of Bitters will be found under other headings.

3954.

Bitters in Powder.

Gentian, in fine powder,	4	ounces.
Golden Seal, in fine powder,	4	ounces.
Black Cohosh, in fine powder,	2	ounces.
Rhubarb, in fine powder,	1	ounce.
Cinnamon, in fine powder,	$\frac{1}{2}$	ounce.
Nutmeg, in fine powder,	1	ounce.
Aloes, in fine powder,	1	ounce.
Bicarbonate of Sodium,	$\frac{1}{2}$	ounce.
Ginger, in fine powder,	$\frac{1}{4}$	ounce.

Mix thoroughly.

This is to be put up in boxes, or packages of about 1 ounce, which sell generally for 25 cents.

The contents of the package is to be put into $\frac{3}{4}$ of a pint of Water, and $\frac{1}{4}$ pint of Alcohol, and a tablespoonful is to be taken before meals.

A much cheaper Bitters Powder, which has had a good sale under various names, may be made with

Aloes, in fine powder,	8 ounces.
Canella, in fine powder,	8 ounces.
Lupulin, in fine powder,	$\frac{1}{2}$ ounce.
Cassia, in fine powder,	$\frac{1}{2}$ ounce.

Mix them. To take, prepare as above, using only half the quantity of the powder

BLOOD PURIFIERS.

Remedies for purifying the blood are mostly included under other headings, as Alteratives, Bitters, Sarsaparillas, etc. A few only of such as are known by the title of "Blood Purifiers" are given here.

3955.

Blood Purifier.

Burdock Root,	8 ounces av.
Stillingia,	8 ounces av.
Sarsaparilla,	8 ounces av.
Senna Leaves,	4 ounces av.
Sassafras Bark,	2 ounces av.
Iodide of Potassium,	1 ounce av.
Oil of Wintergreen,	20 minims..
Sugar,	1 pound av.
Alcohol,	$3\frac{1}{2}$ pints.

Water, sufficient to make a gallon.

Grind the drugs to a coarse powder, and, having mixed a pint of the Alcohol with a pint of Water, macerate them for 24 hours with the liquid; then pack in a percolator, mix the remaining $2\frac{1}{2}$ pints of Alcohol with an equal measure of Water and pour upon the drugs; set in a warm place for 24 hours, then percolate slowly, adding Water to the drugs after the liquid has all disappeared from the surface, and continuing the percolation until $7\frac{1}{2}$ pints have passed. Dissolve the Oil of Wintergreen in half an ounce of Alcohol and add the solution, with the Sugar and Iodide of Potassium, to the percolate; dissolve and filter.

The dose is a teaspoonful to a tablespoonful.

This may be put up as Blood Purifying Bitters, Blood Cleanser, or by any other similar title.

3956.

Blood Purifying Tea.

Burdock Root, cut,	4 ounces.
Blue Flag Root, cut,	1 ounce.
Dandelion Root, cut,	3 ounces.
Sassafras Bark, cut,	1 ounce.
Sarsaparilla Root, cut,	4 ounces.
Wild Cherry Bark, cut,	2 ounces.
Yellow Dock Root, cut,	1 ounce.

Mix thoroughly and put up in packages of about 2 ounces. Directions for preparing : Steep the contents of the package in a quart of Water, with gentle heat, for two hours, strain off $1\frac{1}{2}$ pint into a quart bottle and add half a pint of Alcohol and 4 ounces of Sugar. The dose is a wineglassful for adults, before meals and at bedtime ; children in proportion, according to age.

CARMINATIVES.

Carminatives are a class of mild, aromatic astringent preparations intended to be used for diarrhœa, summer complaints and like disorders. They are particularly adapted to children, being mild, pleasant to take, and effective. Other preparations of a similar nature will be found under other headings. See also Cholera Cures, Dysentery Remedies, etc.

3957.

Blackberry Carminative.

Blackberry Juice,	4 pints.
Tincture of Opium,	3 fl.ounces.
Fluid Extract of Blackberry,	8 fl.ounces.
Fluid Extract of Wild Yam,	2 fl.ounces.
Oil of Cinnamon,	30 minims.
Oil of Nutmeg,	20 minims.
Oil of Sassafras,	30 minims.
Sugar,	2 pounds av.
Alcohol,	2 pints.
Water, sufficient to make	1 gallon.

Mix the Fluid Extracts with the Juice and dissolve the Sugar in the mixture by agitation. Dissolve the Oils in the Alcohol and add to the mixture, then add enough Water to make a gallon of the preparation and, after standing a few days, filter.

Dose, for children, from half to a teaspoonful ; for adults, from a teaspoonful to a tablespoonful.

3958.

Carminative Cordial.

Catechu,	4	ounces av.
Opium,	1	ounce av.
Camphor,	$\frac{1}{2}$	ounce av.
Oil of Peppermint,	1	fl.drachm.
Oil of Cinnamon,	20	minims.
Oil of Cloves,	20	minims.
Sugar,	2	pounds av.
Alcohol,	2	pints.
Water, sufficient to make	1	gallon.

Macerate the Catechu, Opium and Camphor, with $1\frac{1}{2}$ pints of Alcohol, mixed with 2 pints of Water for seven days, agitating every day, pour off the liquid and reserve; pour the drugs upon a filter and percolate them with Water until 3 pints of percolate have been obtained, mix this with the reserved liquid; dissolve the Oils in the remaining half pint of Alcohol, and add to the mixture, then filter, dissolve the Sugar in the filtrate, and add enough Water, if necessary, to make a gallon of the finished product.

Dose, for children, from half to a teaspoonful; for adults, a teaspoonful to a tablespoonful.

3959.

Ginger Carminative.

Jamaica Ginger, in No. 40 powder,	6	ounces av.
Blackberry Root, in No. 40 powder,	1	pound av.
Cinnamon, in No. 50 powder,	1	ounce av.
Nutmeg, in No. 50 powder,	1	ounce av.
Sassafras, in No. 40 powder,	1	ounce av.
Tincture of Opium,	4	fl.ounces.
Sugar,	2	pounds av.
Alcohol,	3	pints.
Water, sufficient to make	1	gallon.

Mix the powdered drugs and, having mixed the Alcohol with 3 pints of Water, moisten the drugs with 2 pints of the liquid and macerate in a closed vessel for 24 hours; then pack in a percolator, pour the remainder of the liquid upon it and, after standing one day, percolate, adding Water through the percolator after the liquid has disappeared from the surface, and continuing the percolation until 6 pints are obtained; add the Tincture of Opium and filter, and to the filtrate add the Sugar and, after the Sugar is dissolved, enough Water to make a gallon.

Dose, for children, from half to a teaspoonful; for adults, a teaspoonful to a tablespoonful.

CATARRH REMEDIES.

Besides the general remedies which are *taken* for catarrh, which will be found under other headings, as Alteratives, Blood Purifiers, Tonics, etc., there are several preparations designed for application, to be used by insufflation or to be applied in the form of an ointment. They are as follows :

3960. Catarrh Remedy—Liquid.

Fluid Extract of Hydrastis (Aqueous) or "Fluid

Hydrastis,"	3 fl.ounces.
Carbolic Acid,	2 drachms.
Sulphate of Zinc,	4 drachms.
Sulphate of Morphine,	10 grains.
Glycerin,	8 fl.ounces.
Water,	5 fl.ounces.

Mix them. To use, put 1 teaspoonful of common salt in a small cup of water, add 1 teaspoonful or more of the Remedy and use by insufflation or with a douche. This also makes an excellent gargle for sore throat, etc.

3961. Catarrh Remedy—Powder.

Golden Seal, in fine powder,	4 ounces.
Chlorate of Potassium, in fine powder,	1 ounce
Sulphate of Zinc,	2 drachms.
Sulphate of Morphine,	10 grains.
Salicylic Acid,	10 grains.

Mix them well together. A teaspoonful of this powder and 2 teaspoonfuls of salt added to a pint of boiling water makes a liquid to be used with a douche or by insufflation.

3962. Camphorated Cream Salve.

For Catarrh, Etc.

Camphor, in coarse powder,	80 grains.
Carbolic Acid,	60 grains.
Oil of Eucalyptus,	2 fl.drachms.
Tincture of Aconite Root,	2 fl.drachms.
Yellow Wax,	2 ounces av.
Petrolatum,	16 ounces av.

Melt the Wax and Petrolatum, mix the Camphor, Carbolic Acid, Oil of Eucalyptus, and Tincture of Aconite, and, when the Camphor is dissolved, add the mixture to the melted mass while cooling. This may also be used as an ointment for chilblains, chaps, etc., and whenever a soothing, healing ointment is desired.

3963. Catarrh Cream Balm.

Tincture of Aconite,	2 fl.drachms.
Carbolic Acid (crystals),	1 drachm.
Oil Sassafras,	30 minims.
White Pine Turpentine,	2 drachms.
Yellow Wax,	2 ounces av.
Petrolatum,	16 ounces.

Melt the Wax, Turpentine, and Petrolatum together and, when cooling, add the Tincture, Carbolic Acid, and Oil, mixing them well together.

3964. Catarrh Cure or Salve.

Oil of Tar,	30 minims.
Oil of Sassafras,	1 fl.ounce.
Oil of Eucalyptus,	2 fl.drachms.
Oil of Peppermint,	10 minims.
Tincture Aconite Root,	2 fl.drachms.
Yellow Wax,	2 ounces av.
Petrolatum,	16 ounces av.

Melt, and make in the same manner as the preceding.

3965. Catarrh Snuff.

Catarrh Snuff, which was once a popular proprietary remedy, has now become of slow sale. The following formula will be sufficient:

Euphorbium, in very fine powder,	$\frac{1}{4}$ ounce.
Bismuth Subnitrate,	$\frac{1}{2}$ ounce.
Salicylic Acid,	$\frac{1}{4}$ ounce.
Oil of Wintergreen,	30 minims.
Scotch Snuff,	15 ounces.

Mix them by rubbing the Oil of Wintergreen with a portion of the Snuff, adding the Euphorbium and Salicylic Acid, and then mixing with the remainder of the Snuff.

CATHARTICS AND LAXATIVES.

A great variety of preparations designed to act as laxatives or cathartics are found among proprietary medicines, most of them, however, under some other title. The following are specially representative of this class of preparations, but others, which act as cathartics or laxatives, will be found under other headings. See Elixirs, Tinctures, Syrups, etc.

3966.

Buckthorn Cordial.*Cathartic or Laxative Elixir.*

A cathartic or laxative remedy — something for constipation and the many disorders that proceed from it — is as frequently called for as any patent medicine on the druggist's shelves. Cathartic or Laxative Elixirs, under various names, have been considerably called for of late, and are rapidly taking the place of pills and other physic.

The following has been thoroughly tried and is recommended :

Buckthorn Bark,	16 ounces av.
Rochelle Salts,	8 ounces av.
Senna Leaves,	8 ounces av.
Liquorice Root,	4 ounces av.
Ginger Root,	2 ounces av.
Sweet Flag Root,	1 ounce av.
Coriander Seed,	2 ounces av.
Oil of Wintergreen,	5 minims.
Oil of Peppermint,	10 minims.
Diluted Alcohol,	6 pints.
Sugar,	2 pounds av.
Water, a sufficient quantity to make	1 gallon.

Grind the drugs together to a coarse powder, moisten them with 2 pints of diluted Alcohol and macerate in a covered vessel for 24 hours, then transfer to the water-bath percolator, pack moderately, pour upon them the remaining 4 pints of diluted Alcohol and set in a warm place for 24 hours; then heat moderately and, after one hour, begin to percolate, adding Water to the drugs after the liquid has disappeared from the surface, and continuing the heat and percolation until 7 pints are obtained. In this percolate dissolve the Rochelle Salts and the Sugar, add the Oils, previously dissolved in

half an ounce of Alcohol, and, after standing a few days, strain or filter.

The dose, as a cathartic, is a tablespoonful to a wineglassful before breakfast or at night; as a laxative, a teaspoonful to a dessertspoonful.

3967.

Cascara Cordial.*Cathartic or Laxative Cordial.*

This cordial is highly recommended as a remedy for habitual constipation and the disorders which attend it, as sick-headache, liver and stomach troubles, etc.

Cascara Sagrada Bark,	16	ounces av.
Liquorice Root,	6	ounces av.
Sweet Flag Root,	2	ounces av.
Cardamom Seed,	1	ounce av.
Angelica Root,	1	ounce av.
Bicarbonate of Sodium,	$\frac{1}{2}$	ounce av.
Diluted Alcohol,	6	pints.
Sugar,	2	pounds.
Water, sufficient to make	1	gallon.

Make in the same manner as is directed for Buckthorn Cordial. Dissolve the Bicarbonate of Sodium in the diluted Alcohol before percolating.

The dose, as a cathartic, is a tablespoonful to a wineglassful; as a laxative, from a teaspoonful to a dessertspoonful.

3968.

Castorol.*Child's Laxative, "Castoria."*

Under the name "Castoria," a laxative and regulator for children has been extensively sold, and it is an excellent preparation. The original is made after the formula of Dr. Samuel Pitcher, which is:

Senna Leaves,	16	ounces.
Pumpkin Seed,	6	ounces.
Anise Seed,	1	ounce.
Worm Seed,	3	ounces.
Rochelle Salts,	4	ounces.
Bicarbonate of Sodium,	2	ounces.
Sugar,	6 $\frac{1}{2}$	pounds.
Essence of Wintergreen,	$\frac{1}{2}$	fl.ounce.
Essence of Peppermint,	1	fl.drachm
Water, sufficient to make	1	gallon.

Bruise the Senna, Pumpkin Seeds, Anise, and Worm Seed and steep them in 6 pints of Water, with gentle heat, for three hours; pour off the liquid and reserve; put 2 pints more Water on the drugs and steep for one hour more, then pour off the liquid, press lightly, and add the liquid to the portion previously reserved and evaporate it by gentle heat to 5 pints. When cool, strain, add the Essences and dissolve the Sugar, Salts, etc., in the liquid, by agitation. This may also be made by water-bath percolation in the usual manner.

The dose is half a teaspoonful to a tablespoonful, according to age, etc. It is an excellent laxative for children, and, in fact, for adults.

3969. Cathartic Liver Pills.

Extract Nux Vomica,	10 grains.
Podophyllin,	10 grains.
Capsicum, in fine powder,	20 grains.
Extract Hyoscyamus,	30 grains.
Purified Aloes,	100 grains.

Mix and make 100 pills.

Each pill contains $\frac{1}{10}$ grain each Extract Nux Vomica and Podophyllin, $\frac{1}{2}$ grain of Capsicum, about $\frac{1}{3}$ grain Extract Hyoscyamus, and 1 grain of Purified Aloes.

The dose, as a laxative and liver pill, is 1, before meals, from once to three times a day; as a cathartic, 2 to 4 pills.

This is an excellent tonic and liver pill, particularly valuable for habitual constipation, headache, inactive liver, etc., and cannot fail to give satisfaction.

3970. Little Giant Liver Pills.

Aloin,	10 grains.
Podophyllin,	20 grains.
Capsicum,	10 grains.
Extract of Nux Vomica,	20 grains.
Hyoscyamine,	2 grains.

Mix, and make 100 pills.

These are generally sold under the title of Little Liver Pills, but are mostly used as a laxative or cathartic, the dose as a cathartic being 3 to 4 pills at night or morning.

Many other formulas for Cathartic Pills will be found under "Pills."

3971.

Fruit Laxative Lozenges.

Under the name *Tamar-Indien Tropical Fruit Laxative, Confectio-Laxative*, etc., Laxative or Cathartic Lozenges have had a good sale. The following formula makes a good preparation of this sort. They are usually put up half a dozen in a tin box for 25 cents, or one dozen for 50 cents.

Tamarind pulp, thick,	2 ounces.
Extract of Senna,	2 ounces.
Aloin,	10 grains.
Podophyllum Resin (Podophyllin),	10 grains.
Manna,	1 ounce.

The Tamarind Pulp should be thick and the Extract of Senna of as firm consistence as can be obtained. The substances should then be warmed and well kneaded together, then rolled out and cut into oval lozenges of about 45 grains, covered with tin foil and wrapped in paraffin paper.

The dose, as a laxative, is 1 lozenge at night; as a light cathartic, 2 lozenges may be taken.

Fig Pulp may be used in place of Tamarind Pulp. A very fine lozenge may be made by using a portion of Pistachio paste in the mixture.

Grape Sugar may be used in place of Manna, but is not so good.

3972.

Laxative Tea.

Buckthorn Bark, cut,	4 ounces.
Dandelion Root, cut,	4 ounces.
Senna Leaves, cut,	4 ounces.
Liquorice Root, cut,	1 ounce.
Sweet Flag Root, cut,	$\frac{1}{2}$ ounce.
Coriander Seed, bruised,	$\frac{1}{2}$ ounce.
Anise Seed, bruised,	$\frac{1}{2}$ ounce.

Mix thoroughly, and put up in packages of about two ounces, which will retail for 25 cents.

It is prepared in the same manner as No. 113, and the dose, as a cathartic, is about the same. As a laxative, a package may be steeped in a pint of water, strained and mixed with half a pint of whisky or gin and $\frac{1}{4}$ pound sugar. Dose, a wineglassful.

In the form of powder the Compound Powder of Glycyrrhiza (2764) is a good preparation to put up as a general laxative.

CHOLERA CURES.

The demand for Cholera Cures is limited, of course, to the later summer months, yet there is considerable sale for preparations under this name, as they are used also for dysentery, diarrhœa, etc. Many preparations which may be put up for this purpose have been already given under other headings (see Mixtures, Tinctures, etc.), but the following may be found useful, the first two being original, the others old and popular formulas. Other formulas for similar use will be found under Dysentery Remedies.

3973. Cholera Cure—Stimulating.

Capsicum,	4	ounces av.
Camphor,	4	ounces av.
Catechu,	4	ounces av.
Opium,	1	ounce av.
Oil of Cajeput,	1	fl.ounce.
Oil of Peppermint,	1	fl.ounce.
Oil of Cinnamon,	2	fl.drachms.
Oil of Cloves,	2	fl.drachms.
Alcohol,	7½	pints.
Hot Water,	12	fl.ounces.

Macerate the Catechu and Opium with the hot Water, rubbing them in a mortar until reduced to a pulpy mass, dissolve the Oils and Camphor in the Alcohol, add the Capsicum and the solution of Catechu and Opium, allowing the mixture to macerate a week or longer, shaking every day, then filter.

Dose, as a preventive, 10 to 15 drops in a little water every morning. For cholera, cholera infantum, cholera morbus, colic, cramp, or internal pain, from 15 drops to a teaspoonful in sweetened water every hour, or oftener, if necessary, until relieved. It may also be applied over the pit of the stomach and bowels.

3974. Cholera Remedy—Sedative.

Tincture of Opium,	3	fl.ounces.
Hydrate of Chloral,	1	ounce av.
Spirit (Essence) of Peppermint,	1	fl.ounce.
Ether (Sulphuric),	1	fl.ounce.
Tincture of Catechu,	4	fl.ounces.
Diluted Alcohol,	6	fl.ounces.

Mix the liquids and dissolve the Hydrate of Chloral in the mixture. Dose and directions the same as the preceding.

3975. Asiatic Tincture for Cholera.

Powdered Opium,	1 ounce av.
Camphor,	1 ounce av.
Oil of Cloves,	1 ounce av.
Powdered Capsicum,	1 ounce av.
Hoffman's Anodyne,	1 pint.

Macerate two weeks and filter. Dose, 20 to 60 drops.

3976. Australian Cholera Specific.

Sulphuric Acid,	320 grains.
Nitric Acid,	192 grains.
Sugar,	240 grains.
Gum Arabic,	240 grains.
Water, enough to make a pint.	

Mix the Acids with 12 fl.ounces of Water, add the Sugar and Gum, dissolve, and add enough Water to make a pint.

Dose, a tablespoonful, followed by a drink of water, and repeated in half an hour, or frequently until the disease is checked. The remedy is claimed never to have failed to cure if taken in reasonable time.

3977. New-York "Sun" Cholera Mixture.

Tincture Capsicum,	1 part.
Tincture Opium,	1 part.
Tincture Rhubarb,	1 part.
Spirit Peppermint,	1 part.
Spirit Camphor,	1 part.

Mix. Dose, 15 to 30 drops in a wine glass of water.

3978. Russian Cholera Drops.

Oil of Peppermint,	75 minims.
Tincture Opium,	5 fl.drachms.
Wine of Ipecac,	2 fl.ounces.
Tincture Valerian, etherial,	4 fl.ounces.

Mix. Dose, 10 to 20 minims.

3979. Sparkman's Cholera Mixture.

Camphor,	1	drachm.
Kino,	2	ounces.
Catechu,	$\frac{1}{2}$	ounce.
Powdered Cinnamon,	2	ounces.
Powdered Cloves,	1	ounce.
Powdered Capsicum,	2	ounces.
Brandy, q. s.		

Moisten the powders with Brandy, pack in a percolator, macerate 48 hours and percolate 18 fl.ounces. To this add :

Tincture Opium,	2 $\frac{1}{2}$	fl.ounces.
Chloroform,	1	fl.ounce.

Dose, 60 drops.

3980. Squibb's Cholera Mixture.

Chloroform,	3	parts.
Tincture Opium,	8	parts.
Spirit Camphor,	8	parts.
Tincture Capsicum,	8	parts.
Alcohol,	13	parts.

Mix. Dose, 1 fl.drachm.

3981. Thielemann's Cholera Drops.

Oil of Peppermint,	1	fl.ounce.
Alcohol,	8	fl.ounces.
Tincture Opium and Saffron,	3	fl.ounces.
Tincture Ipecac,	8	fl.ounces.
Tincture Valerian,	13 $\frac{1}{2}$	fl.ounces.

Mix. Dose, 1 to 2 fl.drachms.

CONDITION POWDERS.

The formulæ for Condition Powders are so familiar and common that it seems almost needless to give them here, but they may be found convenient for reference. They are usually made to answer for most of the general ailments of horses and cattle, and are given

to increase the appetite, purify the blood, act on the liver, kidneys, etc. The following represent a variety and serve as sample formulas :

3982. Condition Powder — Vegetable.

For the Blood and Appetite.

Bloodroot, in fine powder,	1 ounce.
Sassafras, in fine powder,	3 ounces.
Liquorice Root, in fine powder,	3 ounces.
Gentian, in fine powder,	1 ounce.
Ginger, in fine powder,	2 ounces.
Fenugreek Seed, in fine powder,	4 ounces.
Senna, in fine powder,	2 ounces.

Mix. Dose, a tablespoonful or more in feed.

It will be observed that this powder is entirely vegetable and more expensive than many of the others. It may be made cheaper by adding to it an equal bulk of Linseed Meal.

3983. Condition Powder — Mineral.

Blood Purifier and Tonic.

Nitrate of Potassium (Saltpetre),	2 ounces.
Bitartrate of Potassium (Cream Tartar),	3 ounces.
Sulphate of Iron (Copperas),	2 ounces.
Sulphate of Antimony (Black Antimony),	1 ounce.
Sulphur,	8 ounces.

Powder and mix. Dose, a tablespoonful or more in feed.

3984. Condition Powder — Diuretic.

Appetizer, Tonic, Diuretic, Etc.

Gentian, in fine powder,	1 ounce.
Ginger, in fine powder,	2 ounces.
Fenugreek Seed, in fine powder,	4 ounces.
Black Antimony, in fine powder,	1 ounce.
Liquorice Root, in fine powder,	3 ounces.
Sal. Nitre, in fine powder,	2 ounces.
Linseed Meal, in fine powder,	3 ounces.

Mix. Dose, a tablespoonful or more in feed.

3985. Condition Powder — General.

Gentian, in powder,	1 ounce.
Fenugreek Seed, in powder,	4 ounces.
Ginger, in powder,	2 ounces.
Liquorice Root, in powder,	3 ounces.
Resin, in powder,	3 ounces.
Sulphur, in powder,	3 ounces.

Mix. Dose, a tablespoonful or more in feed.

3986. Condition Powder — General.

Sal. Nitre, in powder,	1 ounce.
Ginger, in powder,	2 ounces.
Fenugreek, in powder,	3 ounces.
Black Antimony, in powder,	1 ounce.
Liquorice Root, in powder,	1 ounce.
Linseed Meal, in powder,	8 ounces.

Mix. Dose, a tablespoonful or more in feed.

3987. Heave Powder.

For Coughs, Colds, Heaves, Etc.

Lobelia, in fine powder,	2 ounces.
Skunk Cabbage, in fine powder,	4 ounces.
Elecampane, in fine powder,	4 ounces.
Tartrate of Antimony and Potassium,	1 ounce.
Liquorice Root, in fine powder,	5 ounces.

Mix them. The dose is a dessertspoonful to a tablespoonful in feed.

This may be diluted, if desired, with Linseed Meal, powdered Fenugreek, or other powdered drugs.

3988. Hog Cholera Powder.

Remedies for the prevention and cure of Hog Cholera are much used in the West and South. They are of various composition and merits. The following, which is similar to Haas' Hog Remedy, is as popular as any :

Phosphate of Lime, precipitated,	8 ounces.
Common Chalk, in powder,	6 ounces.
Carbonate of Magnesium, powdered,	2 ounces.
Capsicum, powdered,	½ ounce.

Mix them well together.

3989. Hog Cholera Cure.

The following is similar to another popular powder :

Bicarbonate of Sodium,	2 ounces.
Powdered Gentian,	2 ounces.
Powdered Ginger,	3 ounces.
Powdered Nitre,	1 ounce.
Powdered Chalk,	8 ounces.

Mix them thoroughly.

The doses of these powders are, as a preventive, from 1 to 2 teaspoonfuls in feed twice a day ; as a cure, a tablespoonful 3 or 4 times a day.

3990. Poultry Powder.

For the diseases incident to poultry a general powder may be prepared as follows :

Bone, ground, or Slaked Lime,	12 ounces.
Gentian, powdered,	1 ounce.
Capsicum, powdered,	1 ounce.
Ginger, powdered,	2 ounces.
Sulphur,	1 ounce.

Mix them well together. Put a teaspoonful in a quart of feed.

3991. Egg Food.

Phosphate of Lime or Ground Bone,	12 ounces.
Capsicum, in powder,	1 ounce.
Ginger, in powder,	2 ounces.
Cantharides, in powder,	1 drachm.
Sulphur,	1 ounce.
Nitrate of Potassium, powdered,	1 ounce.

Mix them well. Put a tablespoonful in a quart of feed.

3992. Worm Powder.

For Worms and Botts in Horses and Cattle.

Cape Aloes, in powder,	5 ounces.
Betel or Areca Nut, in powder,	8 ounces.
Anise, in powder,	1 ounce.
Fenugreek Seed, in powder,	2 ounces.

Mix them well together. Dose, 2 tablespoonfuls in feed, morning and night.

CORN, BUNION, AND CHILBLAIN CURES.

For the past few years Corn Cures have been the rage, and have become almost as plenty, but not quite so painful, as the corns themselves. The most popular remedies have been those in which Collodion has been used as a base, and which form an artificial skin when applied, and thus keep the medicinal agents in place. The same remedies also apply to bunions. Chilblains require other treatment, but are included under this heading.

3993.

Corn Killer.

This preparation is similar to a variety of preparations known as *German Corn Cures*, *Corn Eradicators*, and by many other names. Extract of Cannabis Indica is used in some, giving the preparation a greenish color.

Gun Cotton (Pyroxylin),	200	grains.
Ether (Sulphuric),	1 1/2	fl.ounces.
Alcohol,	3 1/2	fl.ounces.
Salicylic Acid,	2	ounces av.
Chloride of Zinc,	1	ounce av.

Mix the Ether and Alcohol and dissolve the Gun Cotton in the mixture (this will require a day or two), then add the Salicylic Acid and, when it has dissolved, add the Chloride of Zinc. Keep tightly stopped and away from the light or fire.

This is applied once a day for three days in succession, the part is then bathed in warm water and the skin and adhering corn removed. It may also be applied to bunions.

3994.

Corn Salve — Caustic.

A number of Corn Salves have been popular proprietary preparations, but are not generally so effective as the foregoing.

Caustic Soda or Potassa,	4	ounces av.
Water,	4	fl.ounces.
Starch, in fine powder,	1	ounce av.
Glycerin,	8	ounces av.

Dissolve the Soda or Potassa in the Water by the aid of heat, mix the Starch with the Glycerin and heat, with constant stirring, until the Starch is entirely gelatinized and the preparation is of a uniform consistence, then mix with it the warm solution of Soda and put up while warm in small, wide-mouth bottles or glass boxes.

To use, spread a little of the salve on the corn or bunion, taking care to cover only the part to be removed, cover with a piece of cloth and allow to remain from two to four hours, then soak the parts in warm water.

This is a caustic application and needs only to be applied once or twice. It is equally efficacious for warts.

3995. Corn Salve — Magic.

Salicylic Acid,	2 drachms.
Arsenic,	1 drachm.
Petrolatum,	1 ounce.

Mix them by rubbing well together to form a salve which may be applied on a piece of linen.

3996. Corn Plaster.

The most familiar Corn Plasters are those made by spreading some adhesive plaster over thick felt and then cutting, leaving a hole in the centre, allowing the corn to stick up and thus relieving the pressure upon it.

A good Corn Plaster, to be spread upon leather or cloth, and thus applied to the corn, may be made with Salicylic Acid 1 part, Burgundy Pitch 1 part, Yellow Wax 1 part, melted together and mixed.

3997. Chilblain Lotion.

Oil of Eucalyptus,	2 fl.ounces.
Camphor,	2 ounces av.
Carbolic Acid,	1 ounce av.
Alcohol, sufficient to make	1 pint.

Mix and dissolve. To be applied night and morning. It reduces the inflammation and is a sure cure for chilblains before they break.

3998. Chilblain Ointment.

Oil of Eucalyptus,	1 fl.ounce.
Camphor,	1 ounce av.
Carbolic Acid,	$\frac{1}{2}$ ounce av.
Yellow Wax,	2 ounces av.
Petrolatum,	12 ounces av.

Mix the Wax and Petrolatum and, having mixed the other ingredients and dissolved them, add to the melted substances while cooling and mix well. This is a soothing and curative ointment for chilblains and tender feet.

COUGH REMEDIES.

The variety of cough preparations sold as proprietary remedies is greater than any other line of "patent medicines," and their sale altogether is probably as large as any, but being distributed among so many different kinds is not so noticeable as of some other lines of remedies. In the formulas which follow we have selected representatives only of such as are most popular. They are known on the market by names similar to those given, but the formulas do not claim to make exact duplicates of manufacturer's proprietary medicines, only that they are as good as any. As a general cough remedy the first one of the series (No. 3999) is recommended as giving good satisfaction. It is not like any other in the market, but will make a fine preparation.

3999.

Cough Remedy.

Paregoric,	8	fl.ounces.
Fluid Extract Ipecac,	1	fl.ounce.
Fluid Extract Squill,	1	fl.ounce.
Tincture Tolu,	2	fl.ounces.
Tincture Lobelia,	1	fl.ounce.
Tincture Hyoscyamus,	2	fl.ounces.
Powdered Extract of Liquorice,	$\frac{1}{2}$	ounce av.
Tartar Emetic,	50	grains.
Muriate of Ammonia,	2	ounces av.
Chloroform,	$\frac{1}{2}$	ounce av.
Carbonate of Magnesium,	$\frac{1}{2}$	ounce av.
Sugar,	5	pounds av.
Water, sufficient to make a gallon.		

Rub the Tincture of Tolu with the Carbonate of Magnesium in a mortar, mix the Tinctures and Fluid Extracts with half a gallon of Water, dissolve the Extract of Liquorice in the mixture, add it to the Magnesia, etc., in the mortar and filter through paper until clear. Dissolve the Tartar Emetic in 4 ounces of boiling Water and add the solution and the Muriate of Ammonia to the filtrate and dissolve, put the Sugar in a gallon bottle or jug, add the Chloroform to the dry Sugar and mix them thoroughly, then add the liquid previously prepared and enough Water to make a gallon, and dissolve the Sugar by agitation.

This is an excellent general cough remedy, the dose being $\frac{1}{4}$ to 1 teaspoonful.

4000. Cough Balsam.

Tincture of Tolu,	½ fl.ounce.
Tincture of Opium,	½ fl.ounce.
Tincture of Bloodroot,	½ fl.ounce.
Fluid Extract of Conium,	½ fl.ounce.
Fluid Extract of Elecampane,	¼ fl.ounce.
Oil of Sassafras,	5 drops.
Tartar Emetic,	8 grains.
Boiling Water,	1 fl.ounce.
New Orleans Molasses,	14 fl.ounces.

Dissolve the Tartar Emetic in the boiling Water and add it to the Molasses, dissolve the Oil of Sassafras in the Tincture of Tolu, mix it with the other tinctures and fluid extracts, and add the Molasses to the mixture, shaking them thoroughly together.

4001. Cough Cordial.

Anise Seed,	½ ounce av.
Fennel Seed,	20 grains.
Blood Root,	180 grains.
Wild Cherry,	1 ounce av.
Liquorice Root,	½ ounce av.
Alcohol,	6 fl.ounces.
Water, q. s., or	10 fl.ounces.
Sugar,	6 ounces av.

Grind the drugs to a coarse powder, mix the Alcohol with 8 ounces of Water and, having moistened the drug with 4 ounces of the mixture, allow them to macerate in a covered vessel for 24 hours; then pack moderately in a percolator, pour upon them the remainder of the liquid and percolate, adding Water through the percolator after the liquid has disappeared from the surface, and continuing the percolation until 13 fl.ounces have passed. In this dissolve the Sugar and, after standing a few days, filter.

4002. Cough Cure.

Syrup of Squill,	3 fl.ounces.
Syrup of Tolu,	6 fl.ounces.
Wine of Ipecac,	3 fl.ounces.
Hydrocyanic Acid, diluted,	2 fl.drachms.
Tincture of Opium, Camphorated,	3 fl.ounces.
Tincture of Sanguinaria,	½ fl.ounce.

Mix them. This is an excellent sedative cough cure.

4003. Cough Honey.

Sulphate of Morphine,	8	grains.
Tartar Emetic,	8	grains.
Muriate of Ammonia,	256	grains.
Boiling Water,	1	fl.ounce.
Tincture of Opium, Camphorated,	1	fl.ounce.
Tincture of Tolu,	$\frac{1}{2}$	fl.ounce.
Sugar,	14	ounces av.
Water,	7	fl.ounces.

Mix the Tinctures with the Sugar and agitate in a bottle, dissolve the Morphine and Tartar Emetic in the boiling Water, and the Muriate of Ammonia in 6 ounces of cold Water ; mix the solutions and add them to the Sugar in the bottle. Dissolve by agitation.

If a clear preparation is desired, the Tolu may be rubbed with Magnesium Carbonate and Water, and filtered.

4004. Consumption Cure.

Tincture of Tolu,	$\frac{1}{2}$	fl.ounce.
Fluid Extract of Lobelia,	$\frac{1}{4}$	fl.ounce.
Fluid Extract of Indian Cannabis,	$\frac{1}{4}$	fl.ounce.
Sulphate of Morphine,	8	grains.
Tartar Emetic,	8	grains.
Chloroform,	1	fl.drachm.
Essence of Peppermint,	15	drops.
Boiling Water,	1	fl.ounce.
Sugar,	14	ounces av.
Water,	8	fl.ounces

Mix the Fluid Extracts, Tincture of Tolu, Chloroform, and Essence with the Sugar in a bottle, and agitate them thoroughly ; dissolve the Morphine and Tartar Emetic in the boiling Water, and add the solution with the 8 ounces of Water to the Sugar in the bottle ; keep tightly stopped and agitate until the Sugar is dissolved.

This makes a preparation quite similar to Piso's Cure.

As thus prepared this preparation is not clear, but translucent. A clear syrup may be made by rubbing the tincture of Tolu, Fluid Extract of Lobelia, Fluid Extract of Cannabis Indica and Essence of Peppermint first with $\frac{1}{2}$ ounce of Carbonate of Magnesium, then adding in the mortar 8 ounces of water, rubbing them well together, filtering, adding the Tarter Emetic dissolved in the boiling water, mixing the chloroform with the sugar, and then dissolving the sugar and morphine in the liquid.

4005. Cure for Consumption.

Oil of Wintergreen,	5	minims.
Oil of Peppermint,	15	minims.
Oil of Tar,	60	minims.
Tincture of Tolu,	$\frac{1}{2}$	fl.ounce.
Tincture of Sanguinaria,	$\frac{1}{2}$	fl.ounce.
Fluid Extract of Ipecac,	$\frac{1}{4}$	fl.ounce.
Hydrocyanic Acid,	$\frac{1}{4}$	fl.ounce.
Chloroform,	40	grains.
Molasses (Porto Rico),	1	pint.

Mix and agitate thoroughly. This is similar to a Western preparation.

4006. Compound Syrup of Tar and Wild Cherry.

“German Syrup.”

Oil of Tar,	1	fl.drachm.
Fluid Extract of Ipecac,	$\frac{1}{2}$	fl.ounce.
Fluid Extract of Wild Cherry,	1	fl.ounce.
Tincture of Opium,	$\frac{1}{2}$	fl.ounce.
Sugar,	14	ounces av.
Water,	8	fl.ounces.

Mix the Oil of Tar by Trituration with the Sugar, add the Fluid Extracts and Tincture to the Water and filter, then dissolve the Sugar, by agitation in the filtrate.

This may also be made by adding 1 fl.drachm of Oil of Tar and 1 fl.ounce of Fluid Extract of Wild Cherry to many of the Cough Remedies previously noticed, afterward straining or filtering if necessary.

4007. Compound Syrup of White Pine.

To make this Syrup it is first necessary to prepare a Tincture of White Pine, which is made as follows :

TINCTURE OF WHITE PINE.

White Pine Turpentine (Gum Thus.), . . .	2	ounces av.
Alcohol,	14	fl.ounces.

Cut the gum in small pieces and dissolve it in the Alcohol by the aid of a water-bath, or by macerating for two weeks in a warm place.

COMPOUND SYRUP WHITE PINE.

Sulphate of Morphine,	8	grains.
Fluid Extract of Ipecac,	$\frac{1}{2}$	fl.ounce.
Chloroform,	1	fl.drachm.
Tincture White Pine,	2	fl.ounces.
Carbonate of Magnesium,	$\frac{1}{2}$	ounce av.
Water,	8	fl.ounces.
Sugar,	14	ounces av.

Rub the Carbonate of Magnesium with 1 ounce of Sugar to a fine powder in a mortar and add to it the Tincture of White Pine, rubbing them thoroughly together, then add the Fluid Extract, gradually rub the Water with the mixture and filter; mix the Chloroform with the Sugar in a bottle, dissolve the Morphine in the liquid, then mix the liquid with the Sugar in the bottle and dissolve by agitation.

4008. Compound Syrup of Wild Cherry.

Wild Cherry, in coarse powder,	2	ounces av.
Ipecac, in fine powder,	$\frac{1}{2}$	ounce av.
Bloodroot, in fine powder,	$\frac{1}{2}$	ounce av.
Tincture of Opium,	$\frac{1}{2}$	fl.ounce.
Water, q. s., or	12	fl.ounces.
Sugar,	14	ounces av.
Chloroform,	1	fl.drachm.

Mix the drugs, moisten them with 4 ounces of Water, and macerate for 12 hours, then pack moderately in a conical percolator and percolate with Water until 9 fl.ounces are obtained; mix the Chloroform with the Sugar in a bottle, add the percolate and dissolve by agitation.

4009. Cough Mixture.

The following, with various modifications and additions, is a very common and popular prescription for coughs, etc.:

Syrup of Squill,	1	ounce.
Syrup of Tolu,	1	ounce.
Wine of Ipecac,	1	ounce.
Tincture of Opium, Camphorated,	1	ounce.

To this is frequently added :

Tincture of Bloodroot,	$\frac{1}{4}$	ounce.
Syrup of Wild Cherry,	1	ounce.
Hydrocyanic Acid, diluted,	$\frac{1}{8}$	ounce.

And various other medicines.

4010. Expectorant.

Fluid Extract of Hyoscyamus,	½ fl.ounce.
Fluid Extract of Lobelia,	¼ fl.ounce.
Fluid Extract of Skunk Cabbage,	½ fl.ounce.
Cyanide of Potassium,	8 grains.
Water,	½ fl.ounce.
New Orleans Molasses,	14 fl.ounces.

Dissolve the Cyanide of Potassium in the Water and mix with the Syrup, then add the Fluid Extracts and mix thoroughly.

4011. Honey of Hoarhound and Tar.

Powdered Opium,	60 grains.
Hoarhound,	½ ounce av.
Wild Cherry,	2 ounces av.
Ipecac,	½ ounce av.
Pine Tar,	½ ounce av.
Water, q. s., or	12 fl.ounces.
Sugar,	14 ounces av.

Grind the drugs to a coarse powder and mix them thoroughly with the Tar, pour upon them 4 ounces of Water and macerate for 24 hours, then pack moderately in a conical percolator and percolate with Water until 9 ounces are obtained; dissolve in this the Sugar by agitation.

4012. Sedative Cough Remedy.

Without Opium.

This formula is given to furnish a good remedy without opium (which is often objectionable). This preparation is especially valuable in irritating and obstinate coughs and is a pleasant sedative and expectorant cough remedy.

Bromide of Potassium,	1 ounce av.
Tincture of Sanguinaria (Bloodroot),	3 fl.drachms.
Tincture of Hyoscyamus,	2 fl.ounces.
Ether (Sulphuric),	½ fl.ounce.
Syrup of Ipecac,	2 fl.ounces.
Syrup of Tolu,	7 fl.ounces.
Alcohol,	1 fl.ounce.
Water,	3 fl.ounces.

Dissolve the Bromide of Potassium in the Water and mix the solution with the Syrups; mix the Alcohol with the Ether and Tinctures, then add the mixture to the Syrups and mix.

Dose, the same as other cough remedies, but may be given freely without injury.

4013. Lung Balsam.

Nitric Acid,	120 minims.
Fluid Extract of Lobelia,	1 fl.ounce.
Tincture of Opium,	6 fl.ounces.
Fluid Extract of Conium,	4 fl.ounces.
Extract of Liquorice,	3 ounces av.
Oil of Sassafras,	10 minims.
Alcohol,	1 pint.
Boiling Water,	8 fl.ounces.
Water,	2 pints.
Porto Rico Molasses,	4 pints.

Mix the Fluid Extracts, Tincture of Opium, Oil, Acid, and Extract of Liquorice with the Water and Alcohol; dissolve the Tartar Emetic in the boiling Water and add to the mixture, filter and add the Molasses to the filtrate.

The dose is a teaspoonful.

4014. Terebene Cough Mixture.

Terebene, purified,	1 fl.ounce.
Acacia, in powder,	$\frac{1}{2}$ ounce av.
Sugar,	3 ounces av.
Yolk of Egg,	No. 2.
Anise Water,	2 fl.ounces.
Camphor Water,	$\frac{1}{2}$ fl.ounce.
Distilled Water, to make	8 fl.ounces.

Rub the Acacia and Sugar with the Terebene in a mortar, beat the Yolk of Egg with the medicated Waters and make an emulsion by rubbing with the contents of the mortar, then add Water enough to make 8 fl.ounces. By using Lemon Juice instead of the distilled Water a more palatable preparation may be made.

The dose is a teaspoonful.

4015. Cough Drops or Candy.

There are in the market a great variety of "Cough Drops," which are mainly sold by the ounce and not put up in the general style of proprietary remedies. They are usually made by confec-

tioners and moulded in various shapes, and colored either black, red, or brown. The most popular Black Cough Drops were introduced by Smith Brothers, of Poughkeepsie, N. Y. A similar preparation may be made by adding to 1 pound of Rock Candy and 1 pound of Sugar, mixed and boiled to the proper consistence for making drops, 2 ounces Tincture of Opium, 20 grains Tartar Emetic, $\frac{1}{4}$ ounce Oil of Anise, $\frac{1}{4}$ ounce Oil of Wintergreen, and coloring black with Negrosine.

Cherry Cough Drops are made by adding to 3 parts of Rock Candy and 1 part of Sugar, mixed and boiled to the proper consistence, a very little morphine, tartar emetic, capsicum, and flavoring with bitter almond, and coloring red.

4016. Cough Lozenges or Troches.

Many kinds of Cough Troches or Lozenges have been popular as proprietary medicines. Brown's Bronchial Troches have been as well received as any, but now the compound troches, tablets, or lozenges for colds are coming more into use.

A good Bronchial Troche, similar to the most popular ones, may be made as follows :

Extract of Liquorice, in powder,	1 pound.
Cubebs, in fine powder,	6 ounces.
Sugar, in fine powder,	1 $\frac{1}{2}$ pound.
Acacia, in fine powder,	4 ounces.
Extract of Conium, powdered,	1 ounce.
Tartar Emetic, in powder,	1 drachm.

Mix them well together and, with Mucilage or Water, make into a mass, which is to be rolled out and cut into Lozenges of about 10 grains.

By adding other substances, as Morphine, Opium, Ipecac, etc., other varieties may be made. Similar ingredients may be made into compressed Lozenges, if desired.

DIARRHŒA AND DYSENTERY REMEDIES.

The milder forms of remedies which are used for summer complaints and looseness of the bowels are known in proprietary medicines as Diarrhœa or Dysentery Remedies. Carminatives, which have been already mentioned, are similar. The stronger prepara-

tions are mostly known as cholera cures, mixtures, drops, or by some other similar title. See Cholera Cures, page 1053.

The following are the most popular :

4017. Blackberry Cordial.

Blackberry Juice,	4	pints.
Catechu,	4	ounces av.
Cinnamon,	1	ounce.
Nutmeg,	1	ounce.
Coriander Seed,	1	ounce.
Opium, in powder,	$\frac{1}{4}$	ounce.
Sugar,	2	pounds av.
Alcohol,	$2\frac{1}{2}$	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a coarse powder and, having mixed the Blackberry Juice with the Alcohol, macerate them for a week or ten days in a warm place, then filter, add the Sugar, dissolve by agitation, and, having passed enough Water through the filter, add it to the mixture to make 1 gallon of the finished product.

Dose from a teaspoonful to a dessertspoonful every hour or two until diarrhœa is checked.

This makes a finely flavored, pleasant, and efficient cordial for summer complaints, and will give universal satisfaction. It may be made from the juice freshly expressed from the berries, or from well preserved Blackberry Juice put up by reliable houses.

The following formula, although not quite so nicely flavored, is just as efficient and more convenient to make at all seasons of the year.

4018. Blackberry Cordial.

Made from the Root.

Blackberry Root,	24	ounces av.
Nutmeg,	1	ounce av.
Cinnamon,	1	ounce av.
Coriander Seed,	1	ounce av.
Opium, in powder,	$\frac{1}{4}$	ounce av.
Sugar,	12	ounces av.
Alcohol,	$2\frac{1}{2}$	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a moderately fine powder and, having mixed the Alcohol with 5 pints of Water, moisten them with 2 pints of the

mixture and macerate for 24 hours in a covered vessel, then transfer to the water-bath percolator, pack moderately, pour upon them the remainder of the menstruum, heat moderately for one hour, then turn off the heat and begin to percolate, adding Water to the drugs after the liquid has disappeared from the top and continuing the percolation until $7\frac{1}{2}$ pints have been obtained. Lastly, dissolve the Sugar in the percolate and filter.

Many other remedies for diarrhœa, dysentery and summer complaints will be found under other headings.

4019.

Diarrhœa Tablets.

Catechu in powder,	200 grains.
Kino in powder,	100 grains.
Opium in powder,	25 grains.
Sugar in powder,	600 grains.
Gum Arabic in powder,	175 grains.
Oil of Cinnamon,	20 drops.

Mucilage Acacia, to make a mass which is to be made into 100 lozenges. Dose 1 to 4.

DYSPEPSIA CURES.

Among the general remedies for Dyspepsia may be included all the tonic, stomach, iron, and blood bitters, the alterative tonics and stimulants; but besides these are a class of remedies particularly designed for Dyspepsia, which have a large sale. Dyspepsia is the chief cause of indigestion of amylaceous and nitrogenous food, and it is rational to supply to the stomach the lacking ferments or solvents of those foods, that it may perform its proper functions. Diastase is the proper solvent for amylaceous food and pepsin for nitrogenous. In the animal economy diastase is a constituent of saliva, and in the vegetable it is found in greatest abundance in malted grain, being now most employed in medicine in the form of Malt Extract. Pepsin is the digestive ferment of the stomach, and is abundantly obtained from the stomachs of various animals. Now, while it would seem reasonable to supply to a dyspeptic stomach these elements, the absence of which causes indigestion, yet there are few dyspepsia cures on the market that do so, and, as we

must "follow the fashion," and make formulas for remedies like some that are popular, we give a little variety.

4020. **Dyspepsia Remedy.**

A proprietary remedy known as "*August Flower*," similar to the following, has had a large sale in this country :

Rhubarb,	6	ounces av.
Golden Seal,	1½	ounce av.
Cape Aloes,	¼	ounce av.
Peppermint, herb, freshly dried,	2	ounces av.
Carbonate of Potassium (Sal. Tartar),	2	ounces av.
Capsicum,	30	grains.
Spirit (Essence) of Peppermint,	3	fl.drachms.
Alcohol,	24	fl.ounces.
Porto Rico Molasses,	2	pints.

Water, sufficient to make a gallon.

Reduce the drugs to a coarse powder and, having mixed the Alcohol with 3 pints of Water, dissolve the Carbonate of Potassium in the mixture, moisten the powder with 12 ounces of the liquid and macerate in a warm place for 24 hours ; transfer to a percolator, pack very moderately, pour upon it the remainder of the liquid and percolate, adding Water to the drugs after the liquid has disappeared from the surface, and continuing the percolation until 6 pints have passed ; to this add the Essence of Peppermint and Molasses and, after standing a few days, strain or decant.

This may also be made advantageously by water-bath percolation.

The dose is a teaspoonful to a tablespoonful after meals.

4021. **Dyspepsia Tonic.**

Tincture of Gentian Compound,	4	fl.ounces.
Tincture of Rhubarb,	4	fl.ounces.
Tincture of Ginger,	1	fl.ounce.
Essence of Peppermint,	½	fl.ounce.
Bicarbonate of Sodium,	¾	ounce av.

Water, sufficient to make a pint.

Mix the Tinctures, etc., dissolve the Bicarbonate of Sodium in the Water, mix the solutions and, after standing a day or two, filter.

This is an excellent general remedy for atonic dyspepsia with acid stomach, flatulence, etc.

Dose, a teaspoonful to a dessertspoonful after meals.

4022. Digestive Dyspepsia Remedy.

Malt Extract,	6	fl.ounces.
Pepsin, saccharated,	240	grains.
Tincture of Ginger,	1	fl.ounce.
Fluid Extract of Golden Seal,	1	fl.ounce.
Essence of Peppermint,	$\frac{1}{2}$	fl.ounce.
Fluid Extract of Senna,	1	fl.ounce.
Whisky,	4	fl.ounces.
Water, enough to make a pint.		

Mix them. "Shake before taking."

Dose, teaspoonful or more after meals.

This is not a nice-looking mixture, and would hardly be a popular remedy for the market. It is also too expensive for general sale, but it is a very effective digestive and dyspepsia remedy, and may be found useful by some of our readers.

4023. Dyspepsia Tablets.

Saccharated Pepsin,	1000	grains.
Saccharated Pancreatin,	1000	grains.
Ginger, in fine powder,	50	grains.
Oil of Pimento,	50	minims.
Acacia, in powder,	300	grains.

Make into a mass with water or mucilage and divide into 100 tablets.

Peptonic Tablets may be made to contain in each, pure Pepsin, 1 grain, pure Pancreatin, 1 grain, with Sugar and Gum to make a 5 grain compressed tablet.

Soda-Mint Tablets are made 5 grains of Bicarbonate of Sodium and $\frac{1}{2}$ minim Oil of Peppermint in each.

4024. Dyspepsia Lozenges.

A less expensive Dyspepsia Lozenge or Tablet may be made with

Rhubarb, in fine powder,	500	grains.
Subnitrate of Bismuth,	500	grains.
Bicarbonate of Sodium,	300	grains.
Ginger, in fine powder,	100	grains.
Oil of Peppermint,	50	minims.
Acacia, in fine powder,	300	grains.
Sugar, in fine powder,	300	grains.

Make into a mass with mucilage and divide into 100 tablets or lozenges.

ELIXIRS, ESSENCES, AND EXTRACTS.

Quite a variety of proprietary preparations, under the name Elixirs, Essences, and Extracts, are found in the market, but most of them are included in this work under other headings. Of the first, the general Elixirs of Calisaya, Calisaya and Iron, and their combinations, Gentian and Tincture of Chloride of Iron, Elixirs of Pepsin, Elixirs of Lactopeptine, and combinations, have been very popular as pseudo-proprietary medicines. Many other proprietary medicines are also known as Elixirs, as Blood Elixir, Tonic Elixir, Down's Elixir for Coughs, McMunn's Elixir of Opium, etc.

Of the *proprietary* remedies known as Essences, Essence of Ginger is the only one which has any popular sale, and that is more frequently called for as Extract of Ginger than as it is usually labeled. Of the Extracts sold as proprietary most of them are included under other headings, but a few are mentioned here for want of better classification.

4024. Essence or Extract of Jamaica Ginger.

This preparation, more than any other, has been a popular favorite for mild forms of Diarrhœa and Summer Complaint. It is also much used as a quick stimulant for colds, cramp, colic, etc., and for dyspepsia. It is a popular domestic remedy and has a ready sale at all drug stores. The formula is as follows:

Jamaica Ginger Root, unbleached, in moderately fine powder,	3 pounds av.
Alcohol, sufficient to make	1 gallon.

Moisten the powder with 2 pints of Alcohol and pack firmly in the water-bath percolator, pour upon it 2 pints of Alcohol and set in a warm place for two days, then heat moderately and, after one hour, begin to percolate, adding Alcohol to the drug and continuing the heat and percolation until 1 gallon is obtained. The Alcohol remaining in the drug may be recovered by distillation.

The process of water-bath percolation is particularly valuable in making this preparation; no extract can be made by the cold process which equals it in flavor and strength. Consequently, many manufacturers have been in the habit of adding Capsicum, which is very objectionable in such a preparation.

The dose of this preparation is from 10 to 60 drops in sweetened water.

4025. Aromatic Extract of Jamaica Ginger.

As some of the Essences of Ginger on the market contain aromatics combined with the Ginger, this formula is given :

Jamaica Ginger, unbleached, in powder,	3 pounds av.
Calamus, in powder,	1 ounce.
Canada Snake Root, in powder,	1 ounce.
Cinnamon and Mace, each,	1 drachm.
Oil of Lemon, fresh,	2 fl.drachms.
Alcohol, sufficient to make	1 gallon.

Make an extract of the drugs by percolation the same as directed in the preceding formula and add the Oil of Lemon.

This is used for the same purposes and given in the same quantities as the preceding.

4026. Extract Pinus Canadensis.

This is a fluid extract prepared from the inner bark of hemlock trees, by extracting with water and evaporating the liquor until it is reduced to a thick fluid extract, which may be preserved by the addition of 3 fl.ounces of glycerin in a pint.

A "white" or colorless extract is made from this by mixing with freshly precipitated Oxide of Iron and treating as directed for detanating (515).

These Extracts are used for washes, injections, etc., and given internally for chronic diarrhoea and other similar diseases.

4027. Extract of Shaker's Roots.

Sarsaparilla Root,	4 ounces.
Leptandra Root,	2 ounces.
Mandrake Root,	1 ounce.
Valerian Root,	2 ounces.
Calamus Root,	1 ounce.
Hydrangea Root,	4 ounces.
Diluted Alcohol, sufficient to make	1 pint.

Make a pint of Extract by water-bath percolation.

This is a general alterative, given in small doses, for almost everything.

Other Extracts, which are put up as proprietary, are mostly included under other headings. The Buchu Extracts will be found under Kidney and Liver Cures, the Malt Extracts and combinations under Malt preparations, Witch Hazel Extract under Distilled Extracts, the Sarsaparilla Extracts under various headings, etc.

EYE WATERS.

Although the sale for proprietary Eye Waters is small as compared with other remedies it is steady, and the preparations pay a large margin of profit and are easily prepared ; therefore druggists can make it profitable to put them up.

The following formulas are representative of the best preparations of this kind :

4028. Standard Eye Water.

Sulphate of Zinc,	20 grains.
Sulphate of Morphine,	16 grains.
Glycerin,	2 fl.ounces.
Rose Water,	14 fl.ounces.

Mix and dissolve.

4029. Eye Water.

Fluid Hydrastis,	2 fl.drachms.
Sulphate of Zinc,	16 grains.
Sulphate of Morphine,	16 grains.
Borax,	30 grains.
Glycerin,	2 fl.ounces.
Rose Water,	14 fl.ounces.

Mix and dissolve.

4030. Eye Water.

Solution Subacetate of Lead,	30 minims.
Glycerin,	2 fl.ounces.
Distilled Water,	14 fl.ounces.

Mix.

Any of the foregoing formulæ make good general Eye Waters, similar to those which are sold as proprietary remedies. They are usually put up in 1 ounce bottles and sold at 25 cents.

EYE SALVES.

The demand for Eye Salves, like Eye Waters, is steady but not large, yet they are so easily made and so profitable that druggists should put them up for their trade. The following formulæ make

reliable preparations. It is necessary to have all the ingredients in very fine powder, and have them thoroughly mixed :

4031. Standard Eye Salve.

Oxide of Zinc, 1 ounce.
Sulphate of Morphine, 30 grains.
White Petrolatum Ointment, 9 ounces.

Rub the Morphine intimately with the Zinc to an impalpable powder and gradually incorporate the Petrolatum with the mixture. The Hubuck's English Oxide of Zinc is the best for this purpose.

4032. Astringent Eye Salve.

Liquor of Subacetate of Lead, 2 fl.drachms.
Opium, in fine powder, 30 grains.
Tannin, in fine powder, 20 grains.
White Petrolatum Ointment, 8 ounces.

Mix the Goulard's Extract (Liquor Subacetate of Lead) with the Tannin and Opium and gradually incorporate the Petrolatum Ointment with the mixture. This is particularly useful for granulated lids and chronic sore eyes.

4033. Eye Salve.

Ammoniated Mercury (White Precipitate), . . . 240 grains.
Sulphate of Morphine, 20 grains.
White Petrolatum Ointment, 8 ounces.

Rub the Ammoniated Mercury and the Morphine to a very fine powder and gradually incorporate the Ointment intimately with the mixture.

4034. Eye Salve.

Calamine, 1 ounce.
Sulphate of Morphine, 20 grains.
White Petrolatum Ointment, 9 ounces.

Rub the Calamine and Morphine together and gradually incorporate the Ointment with the mixture.

FEMALE REMEDIES.

For the past few years a very large trade has been built up on proprietary remedies for female complaints. These consist mostly

of uterine and nerve tonics combined. The following formulæ will make preparations as valuable and reliable as any, and are representative of different kinds.

4035.

Female Remedy.*Women's Health Restorative.*

Cramp Bark (<i>Viburnum Opulus</i>),	8	ounces av.
Catnep,	4	ounces av.
False Unicorn Root (<i>Helonias</i>),	8	ounces av.
Senna Leaves,	8	ounces av.
Partridgeberry (<i>Mitchella</i>),	12	ounces av.
Cinnamon "Saigon,"	$\frac{1}{2}$	ounce.
Nutmeg,	$\frac{1}{2}$	ounce.
Spirit of Nitrous Ether,	4	fl.ounces.
Sugar,	8	ounces av.
Alcohol,	3	pints.
Water, sufficient to make a gallon.		

Grind the drugs to a coarse powder and, having mixed the Alcohol with 3 pints of Water, moisten the powder with 3 pints of the liquid, pack firmly in the water-bath percolator, pour upon it the remainder of the liquid and set in a warm place for two days, then heat moderately and, after one hour, begin to percolate, adding Water to the drug after the liquid has all disappeared from the surface of the drugs, and continuing the percolation with Water until $7\frac{1}{2}$ pints have been obtained ; to this add the Sugar and Spirit of Nitre; dissolve and filter.

This may be made from the fluid extracts, instead of the drugs, as follows : Fluid Extract Cramp Bark, Fluid Extract False Unicorn, Fluid Extract Senna, each 8 fl.ounces, Fluid Extract Mitchella 12 fl.ounces, Fluid Extract Catnep 4 fl.ounces, Spirit of Nitrous Ether 4 fl.ounces, Oil of Cassia 20 minims, Oil of Nutmeg 30 minims, Sugar 8 ounces av., Alcohol 2 pints, Water sufficient to make 1 gallon.

Mix the Fluid Extracts and Spirit of Nitre, dissolve the Oils in the Alcohol and add to the solution 2 pints of Water, mix this with the Fluid Extracts, etc., dissolve the Sugar in the mixture and add enough Water to make a gallon.

The dose of this preparation is from 1 to 2 teaspoonfuls four times a day.

4036.

Aletris Cordial.

This is similar to the old eclectic preparation known as "Mothers' Cordial." The following formula will make a satisfactory preparation :

Unicorn Root (Aletris),	8	ounces.
Catnep Herb,	4	ounces.
Cramp Bark,	4	ounces.
Partridgeberry Leaves,	8	ounces.
Blue Cohosh,	2	ounces.
Cinnamon Bark,	1	ounce.
Orange Peel,	1	ounce.
Caraway Seed,	$\frac{1}{2}$	ounce.
Sugar,	$2\frac{1}{2}$	pounds av.
Alcohol,	$2\frac{1}{2}$	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a coarse powder and macerate 24 hours with the Alcohol mixed with an equal measure of Water, then percolate, adding Water after the liquid has disappeared from the surface of the drugs, and continue the percolation with Water until $6\frac{1}{2}$ pints of the liquid are obtained ; filter, dissolve the Sugar in the filtrate and add enough Water to make a gallon of the finished cordial.

The dose is a teaspoonful to a tablespoonful four times a day.

4037.

Favorite Female Remedy.

Witch Hazel Bark,	8	ounces av.
Unicorn Root,	8	ounces av.
Senna Leaves,	6	ounces av.
Catnep Herb,	4	ounces av.
Life Root Plant (Senecio Aureus),	4	ounces av.
Vervain Herb,	4	ounces av.
Black Haw Bark,	4	ounces av.
Cinnamon Bark,	$\frac{1}{2}$	ounce av.
Nutmeg,	$\frac{1}{2}$	ounce av.
Sugar,	8	ounces av.
Spirits of Nitre,	4	fl.ounces.
Alcohol,	3	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a coarse powder, mix the Alcohol with 3 pints of Water, moisten the drug with 2 pints of the mixture and pack firmly in the water-bath percolator, pour the remainder of the mix-

ture upon the drugs and set in a warm place for two days, then heat moderately and, after one hour, begin to percolate, adding Water to the drugs and continuing the heat and percolation until 7 pints are obtained ; to this add the Spirits of Nitre, dissolve the Sugar in the mixture, add enough Water to make a gallon, allow to stand a few days and filter.

The dose is a teaspoonful to a tablespoonful four times a day.

4038.

Female Pills.

Under this title a great many pills are found in the market, most of them being indirectly advertised to "cure irregularity," and sold at an exorbitant price.

A variety of formulas for Female Pills will be found among the Pills, or the following may be used :

Ergotin,	100 grains.
Extract Hellebore,	50 grains.
Myrrh,	50 grains.
Sulphate of Iron,	50 grains.
Aloin,	20 grains.

Make into 100 pills.

The dose is 1 to 3 pills two or three times a day.

HAIR DYES, RESTORATIVES, AND TONICS.

Preparations for the hair, to dye or change its color and promote its growth, are extensively sold as proprietary remedies. The following formulæ are the best of the kinds used for their purposes :

HAIR DYES.

4039. "Lightning Dye," Black, for the Hair and Whiskers.

This is similar to the dye used by barbers. It is composed of a mordant and a dye, as follows :

NO. 1. MORDANT.

Pyrogallie Acid,	3 drachms.
Alcohol,	5 fl.ounces.
Water,	11 fl.ounces.

Mix and dissolve.

NO. 2. BLACK DYE.

Nitrate of Silver (Crystals),	2 ounces av.
Aqua Ammonia, q. s., or about	4 fl.ounces.
Distilled Water, q. s., or about	12 fl.ounces.

Dissolve the Nitrate of Silver in 8 fl.ounces of the distilled Water and add 3 fl.ounces of Aqua Ammonia. This will produce a dark brown precipitate. Continue to add Aqua Ammonia in small quantities until the precipitate is entirely redissolved, then add enough distilled Water to make a pint.

In making this preparation for a black dye no more Aqua Ammonia must be used than is necessary to dissolve the precipitate, for a larger quantity than is necessary lightens the color.

4040. **Lightning Dye — Brown.**

Nitrate of Silver,	1 ounce av.
Aqua Ammonia, q. s., or about	2 fl.ounces.
Carbonate of Sodium (Sal Soda),	3 drachms.
Water, q. s., or about	10 fl.ounces.

Dissolve the Nitrate of Silver in 8 ounces of Water and add Aqua Ammonia until the precipitate which is formed is dissolved; dissolve the Sal Soda in the solution and add enough Water to make 12 fl.ounces, and, after standing a few days, decant.

Use the same mordant for this dye as for the black.

To apply these dyes the hair or whiskers are first washed with soda water or soap suds to remove any grease or oil, the mordant is then applied and allowed to dry; the dye is then put on carefully with a tooth-brush or other convenient utensil and dried by fanning; the hair, when dry, is then washed with soapsuds, to remove any superfluous dye, and dried.

Stains on the skin may be removed by rubbing them with the following solution:

Sulphate of Potassium,	1 ounce.
Water,	1 pint.

Dissolve.

4041. **Hair Dye — Black. (One Preparation.)**

Nitrate of Silver,	2 ounces
Nitrate of Copper,	30 grains.
Water of Ammonia, about	4 fl.ounces.
Distilled Water, enough to make a pint.	

Dissolve the Nitrate of Silver and Copper in 8 ounces of distilled Water and gradually add the Water of Ammonia until the precipitate first formed is redissolved, then add sufficient distilled Water to make a pint.

This dye may be used without a mordant.

4042. Blondine, or Golden Hair Coloring.

What is sold on the market for the purpose of bleaching the hair or producing a blonde color is simply *Peroxide of Hydrogen Solution*. It cannot readily be prepared except in a chemical laboratory. The hair is first washed in a weak solution of soda to remove any grease or oil, and then dried by ironing it with a warm flat-iron. The solution is then applied and dried in the same manner, several applications often being necessary to produce the desired color.

HAIR RESTORATIVES.

These preparations, which are designed for changing gray hair to its former natural color, have had a very extensive sale in past years, and still sell considerably. They are generally made to serve as invigorator and dressing for the hair as well as to restore the color. They all act by the absorption of lead and sulphur, and their conversion into sulphide of lead in the hair when exposed to light. It is necessary that these preparations be protected from the light. The following formulæ make preparations similar to those most popular in the market:

4043. Hair Renewer or Balsam.

Acetate of Lead,	1 ½ ounces av.
Lac Sulphur (Precipitated Sulphur),	2 ounces av.
Tincture of Cantharides,	1 fl.ounce.
Glycerin,	1 pint.
Alcohol,	½ pint.
Oil of Citronella,	2 fl.drachms.
Oil of Bergamot,	1 fl.drachm.
Water, sufficient to make a gallon.	

Dissolve the Oils in the Alcohol, add the Glycerin and Tincture of Cantharides and mix with the Water, then add the Sulphur and Acetate of Lead.

4044. Hair Vigor or Vitalizer.

Precipitated (Lac) Sulphur,	2	ounces av.
Nitrate of Lead,	1 1/2	ounces av.
Tincture of Cantharides,	2	fl.ounces.
Glycerin,	1	pint.
Alcohol,	1/2	pint.
Oil of Lavender,	1/2	fl.ounce.
Essential Oil of Almonds,	30	minims.
Water, enough to make a gallon.		

Mix the Sulphur and the Lead and add to half a gallon of the Water, dissolve the Oils in the Alcohol, add the Tincture of Cantharides and Glycerin and add to the mixture; then add enough Water to make a gallon. The Nitrate of Lead is to be preferred to the Acetate on account of the disagreeable odor of the Acetate. If the odor of rose is preferred to Lavender, 3 pints of Rose Water may be used, the Oil of Lavender being omitted.

4045. Hair Renovator.

Acetate or Nitrate of Lead,	1 1/2	ounce av.
Hyposulphite of Sodium,	5	ounces av.
Glycerin,	1	pint.
Alcohol,	1/2	pint.
Oil of Lemon,	2	fl.drachms.
Essential Oil or Almonds,	1/2	fl.drachm.
Oil of Cloves,	1/2	fl.drachm.
Rose Water,	2	pints.

Water, sufficient to make a gallon.

Dissolve the Lead and Hyposulphite of Sodium, each separately, in 2 pints of hot Water and mix the solutions; dissolve the Oils in the Alcohol, add 2 pints of Water and rub with half ounce Carbonate of Magnesium in a mortar, filter and add the filtrate to the other mixture, then add the Glycerin and enough Water to make a gallon.

This makes a preparation without sediment, which is much cleaner to use than those containing the Precipitated Sulphur. It must be kept from the light.

4046. Hair Restorer. (Two Preparations.)

The following is similar to several preparations that have been put upon the market, containing two bottles. It has no particular

advantage over No. 4044, except that the bottles may be exposed to light without causing precipitation.

NO. 1 SOLUTION.

Hyposulphite of Sodium,	2	ounces av.
Rose Water,	1	pint.
Water,	1	pint.
Alcohol,	$\frac{1}{2}$	pint.

Mix and dissolve.

NO. 2 SOLUTION.

Nitrate of Lead,	1	ounce av.
Glycerin,	4	fl.ounces.
Distilled Water,	3	pints.

Mix and dissolve.

Apply No. 1 solution to the hair and allow to dry, then apply No. 2 solution, rubbing it in thoroughly with a hair brush.

4047. Mrs. Allen's Hair Restorer.

From analyses of this preparation, conducted separately by Wittstein and Musset, it is shown to contain Sulphur, Sugar of Lead, and Glycerin, with aromatic water. The following formula very nearly corresponds with the analysis :

Lac Sulphur,	135	grains.
Acetate of Lead,	190	grains.
Glycerin,	$3\frac{1}{2}$	fl.ounces.
Water,	11	fl.ounces.
Cologne or bulk perfume,	1	ounce.

Mix.

This is one of the oldest and best known Hair Restorers.

HAIR TONICS.

4048. Katharion Tonic.

Castor Oil,	4	fl.ounces.
Tincture Cantharides (1880),	4	fl.drachms.
Tannic Acid,	30	grains.
Oil Citronella,	30	minims.
Oil Bergamot,	30	minims.
Oil Cloves,	40	minims.
Oil Lavender Flowers,	60	minims.
Oil Rosemary,	60	minims.
Alcohol,	12	fl.ounces.

Mix.

4049. Hair Tonic.

Tincture of Cantharides,	4 fl.drachms.
Water of Ammonia,	1 fl.ounce.
Cologne,	2 fl.ounces.
Glycerin,	4 fl.ounces.
Borax,	2 drachms.
Bay Rum,	4 fl.ounces.
Water,	4 fl.ounces.

Mix.

This is an excellent tonic, shampoo, or dressing :

4050. Hair Lotion or Wash.

To prevent the Hair from falling out and promote its growth.

Tincture Cantharides,	2 fl.drachms.
Water of Ammonia,	1 fl.drachm.
Glycerin,	1 fl.ounce.
Bay Rum,	5 fl.ounces.
Rose Water,	10 fl.ounces.

Mix them. This is applied as a lotion for baldness, etc., also as a dressing.

4051. Carboline Hair Grower.

Neutral Paraffin Oil,	1 pint.
Cantharides Tincture,	4 fl.drachms
Euphorbium,	20 grains.
Oil of Rosemary,	4 fl.drachms.
Oil of Cassia,	20 drops.
Oil of Cloves,	5 drops.

Heat the Euphorbium and Tincture of Cantharides for 2 hours with the Paraffin Oil, then strain and add the other Oils. This is used for promoting the growth of the hair, baldness, etc. It should be rubbed thoroughly on the scalp.

HEART PREPARATIONS.

The sale for proprietary heart medicines has never been large, for the reason that people who have any trouble with this organ, if pos-

sible, seek the advice of physicians. A very few preparations for heart troubles are found on the market, all similar in composition.

4052. Heart Corrector or Regulator.

Digitalis, in coarse powder,	1 ounce.
Hyoscyamus, in coarse powder,	1 ounce.
American Hellebore (veratrum-viride),	2 drachms.
Diluted Alcohol, sufficient to make	1 pint.

Percolate the drugs with the Diluted Alcohol until a pint of Tincture is obtained. The dose is from $\frac{1}{4}$ to 1 teaspoonful for palpitation or other disturbances of the heart.

HYPOPHOSPHITE COMPOUNDS.

The Compounds of Hypophosphites are considerably sold as proprietary medicines, some special makes being quite popular, but as they have been noticed under solutions, emulsions, malt preparations, syrups and other headings, it will be unnecessary to give further formulas for them in this department.

INHALANTS AND INHALERS.

Inhalants are designed to be used, by being vaporized in Inhalers specially designed for that purpose, and are employed for the relief or cure of asthma, catarrh, colds, bronchitis, hay-fever, and other diseases affecting the air passages. A great variety of Inhalers are made, the most convenient and practical being those which admit of the passage of air through tubes of paper, wood, or other absorbing substance or loose fibrous material which is saturated with the Inhalant. The air then being drawn through these saturated tubes or substances carries the vapor of the Inhalant to the diseased part, where it exerts its curative action. Other forms of Inhalers are those by which a current of air is made to pass through a solution of some volatile medicinal substance contained in a bottle.

The following Inhalants may be put up as proprietary.

4053. Carbolate of Iodine Inhalant.

Carbolic Acid (Crystals),	120 grains.
Glycerin,	1 drachm.
Tincture Iodine,	3 drachms.
Camphor, in powder,	90 grains.
Water of Ammonia, q. s.	

Dissolve the Carbolic Acid in the Glycerin, add the Tincture of Iodine and Camphor, and then add Water of Ammonia drop by drop until the solution is nearly colorless.

4054. Excelsior Inhalant.

Carbolic Acid (Crystals),	1 $\frac{1}{4}$ ounce av.
Camphor,	2 ounces av.
Oil of Eucalyptus,	$\frac{1}{4}$ fl.ounce.
Oil of Sassafras,	1 fl.drachm.
Oil of Tar,	1 fl.drachm.
Oil of Hemlock,	1 fl.drachm.

Mix and dissolve.

This is an excellent Inhalant and may be put up by any other name than the one in the title. It is used for catarrh, etc.

4055. Menthol Inhalant.

Menthol Inhalers are made by enclosing crystallized Menthol or pip-menthol loosely packed in a glass tube which may be opened at both ends. The air being inhaled through the tube is charged with the menthol vapor. They are used chiefly for headache. A solution of Menthol may also be prepared by dissolving 1 ounce of Menthol in 8 ounces of Alcohol. This may be used with any of the ordinary forms of tubular inhalers.

INJECTIONS.

Injectons which are sold as proprietary remedies are mostly for private diseases, but in regular pharmacy Hypodermic Injectons of Apo-morphine, Ergotin and Morphine are official in the Br. P., and many others are prescribed or employed by physicians in their prac-

tice. In this department the proprietary injections only will be noticed.

4056. Injection Brou.

Acacia, in coarse powder,	2 drachms.
Calamine,	1 drachm.
Acetate of Zinc,	1 drachm.
Tincture of Catechu,	4 fl.drachms.
Tincture of Opium and Saffron,	4 fl.drachms.
Water sufficient to make a pint.	

Dissolve the Acacia and Acetate of Zinc in the Water and triturate with the Calamine in a mortar, then add the tinctures. This is to be shaken before using. Ordinary Laudanum may be used instead of the Tincture of Opium and Saffron.

4057. Rose Injection or Rose Wash.

Sulphate of Zinc,	1 drachm.
Tincture of Catechu,	4 fl.drachms.
Tincture of Opium,	4 fl.drachms.
Glycerin,	1 fl.ounce.
Rose Water,	14 fl.ounces.

Mix them.

4058. Compound Hydrastis Injection.

Fluid Hydrastis, or Aqueous Fl. Extract	
Hydrastis,	1 fl.ounce.
Sulphate of Zinc,	1 drachm.
Glycerin,	1 fl.ounce.
Tincture of Catechu,	4 fl.drachms.
Rose Water,	14 fl.ounces.

Mix them.

IODIDE ALTERATIVES.

The following preparations have been popular as proprietary medicines with published formulas of composition, and sold mainly by prescription of physicians.

4059. Iodide of Potassium Elixir Compound.

"Iodia" — Alterative Elixir.

Under the name "Iodia," Battle & Co., Chemists, Corporation of St. Louis, have made and sold an alterative preparation, claiming it

to contain certain alterative preparations combined with Iodide of Potassium and Phosphate of Iron. A good preparation of this kind, containing similar ingredients as is claimed for this, may be made as follows :

Stillingia, in coarse powder,	2	ounces av.
Prickly-Ash Bark,	$\frac{1}{4}$	ounce.
Saxafraga,	1	ounce.
Yellow Parilla,	1	ounce.
Blue Flag,	$\frac{1}{4}$	ounce.
Iodide of Potassium,	256	grains.
Phosphate of Iron (Scale salt 1880),	128	grains.
Diluted Alcohol,	16	fl.ounces.
Water, sufficient to make	1	pint.

Mix the powdered drugs and percolate with the diluted Alcohol first, and then with Water until 15 fl.ounces are obtained. Dissolve the Iodide of Potassium in the tincture and the Iron Salt in 1 ounce of hot Water, and gradually add the tincture to the Iron solution and after standing filter.

By using tasteless "Tincture of Iron" a better preparation may be made.

4060. Elixir Iodides and Bromides of Calcium Compound.

"Elixir Iodo-Bromide of Calcium Compound."

Under the title "Elixir Iodo-Bromide of Calcium Compound," Tilden & Co. of New Lebanon, have had an extensive sale for an alterative compound, claiming to contain many valuable Alterative Salts and medicines. This is noted on page 292. The following formula is suggested by C. S. Hallberg of Chicago, in a paper read before the Illinois Pharmaceutical Association at Bloomington, Ill., October 1, 1884 :

Calcium Bromide,	256	grains.
Sodium Iodide,	256	grains.
Potassium Iodide,	256	grains.
Magnesium Chloride,	256	grains.
Fluid Extract Sarsaparilla Compound,	2	ounces.
Fluid Extract Stillingia Compound,	2	ounces.
Elixir Orange,	4	ounces.
Sugar,	4	ounces.
Water sufficient to make a pint.		

Dissolve the Salts in the Water, add the Sugar, and to this syrup add the fluid extracts previously mixed with the Elixir Orange.

After standing two days filter, adding Water to make the measure 16 fl.ounces.

KIDNEY AND LIVER REMEDIES.

Many of the remedies which are designed to act on the Kidneys and Liver are noticed under other headings, and only those which are known in the market by the name of Kidney and Liver Remedies or Cures, or by other similar titles are included in this section.

There has always been a good demand for proprietary remedies for diseases of the kidneys, bladder and urinary organs. In the earlier days, Vaughn's Lithontriptic and Constitution Water were popular. More recently, Helmbold's and other Buchus had a big run; still more lately Diuretic Elixirs of various kinds have had their day, and now a large family of Liver and Kidney Remedies have swept everything else out of the way, and are having the market all to themselves. So extensively have some of these late remedies been advertised and pushed, that it is now difficult to find a man, woman, or child who has not some serious kidney difficulty.

In making the formulæ for those preparations we would have preferred to confine their use to the kidneys, bladder, and urinary organs, but we must follow the fashion and include the liver also.

The formulæ which follow make preparations similar to those most popular in the market, and are representative of different kinds of kidney and liver remedies.

4061. Diuretic Cordial, Kidney and Liver Remedy.

Liverwort, herb (Hepatica),	16	ounces av.
Dandelion Root,	8	ounces av.
Digitalis, leaves,	1	ounce av.
Hydrangea Root,	4	ounces av.
Wintergreen, herb,	2	ounces av.
Nitrate of Potassium,	3	ounces av.
Sugar,	12	ounces av.
Alcohol,	1½	pints.
Menthol,	5	grains.
Water, sufficient to make a gallon.		

Grind the herbs, etc., to a coarse powder and, having mixed the Alcohol with 4 pints of Water, moisten the powder with 2 pints of the mixture and macerate in a covered vessel for 24 hours; transfer to the water-bath percolator, pack moderately, pour upon it the remainder of the liquid and set in a warm place for one day; then heat

very moderately and, after one hour, begin to percolate, adding Water through the percolator after the liquid has disappeared from the surface, and continuing the heat and percolation until $7\frac{1}{2}$ pints have passed; in this dissolve the Nitrate of Potassium and Sugar, and, after standing a few days, filter.

This may be made by the ordinary method of percolation instead of by water-bath, but the latter is preferable.

If it is desired to use fluid extracts instead of the drugs, the formula is as follows: Fluid Extract of Liverwort 16 fl.ounces, Fluid Extract of Dandelion 8 fl.ounces, Fluid Extract of Hydrangea 4 fl.ounces, Fluid Extract of Digitalis 1 fl.ounce, Essence of Wintergreen 1 fl.drachm, Nitrate of Potassium 3 ounces av., Sugar 12 ounces av., Alcohol 10 fl.ounces, Menthol 5 grains, Water 5 pints.

Mix the Fluid Extracts, Alcohol, and Water, add the Essence of Wintergreen and Menthol, dissolve the Sugar and Nitre in the liquid, and filter.

This is very similar to, but considerably stronger than, the "Safe" cure. The usual dose is from a dessertspoonful to a tablespoonful, the latter containing about 5 grains of Nitrate of Potassium.

4062.

Kidney and Liver Remedy.

Dandelion Root,	12 ounces av.
Buchu Leaves, short,	8 ounces av.
Liverwort, herb,	8 ounces av.
Hydrangea Root,	4 ounces av.
Spirit of Nitrous Ether,	8 fl.ounces.
Sugar,	12 ounces av.
Alcohol,	2 pints.

Water, sufficient to make a gallon.

Grind the drugs to a coarse powder and, having mixed the Alcohol with 4 pints of Water, moisten the powder with 2 pints of the mixture and macerate in a covered vessel for 24 hours; transfer to the water-bath percolator, pack moderately, pour upon it the remainder of the liquid and set in a warm place for one day, then heat very moderately and, after one hour, begin to percolate, adding Water to the drugs after the liquid has disappeared, and continuing the heat and percolation until 7 pints have passed; to this add the Spirit of Nitre and the Sugar, and enough Water to make a gallon, and, after standing a few days, strain.

This may be made by the ordinary method of percolation instead of by water-bath. The dose is a dessertspoonful to a tablespoonful.

It may be made from fluid extracts by taking Fluid Extract of Dandelion 12 fl.ounces, Fluid Extract of Buchu 8 fl.ounces, Fluid Extract of Liverwort 8 fl.ounces, Fluid Extract of Hydrangea 4 fl.ounces, Spirit of Nitre, sweet, 8 fl.ounces, Sugar 12 ounces av., Alcohol 1 pint, Water $4\frac{1}{4}$ pints.

Mix, dissolve the Sugar, and filter.

4063. Buchu Compound.

Buchu Leaves, short,	12	ounces av.
Juniper Berries,	8	ounces av.
Liverwort, herb,	4	ounces av.
Hydrangea Root,	4	ounces av.
Acetate of Potassium,	4	ounces av.
Spirit of Nitrous Ether,	4	fl.ounces.
Sugar,	12	ounces av.
Alcohol,	$2\frac{1}{2}$	pints.

Water, sufficient to make a gallon.

Grind the drugs to a coarse powder and, having mixed the Alcohol with 4 pints of Water, moisten them with 2 pints of the mixture and macerate in a covered vessel for 24 hours; transfer to the water-bath percolator, pack moderately, pour upon them the remainder of the liquid and set in a warm place for one day, then heat very moderately and, after one hour, begin to percolate, adding Water to the drugs after the liquid has disappeared from the surface, and continuing the heat and percolation until $7\frac{1}{4}$ pints have passed; in this dissolve the Sugar and Acetate of Potassium and, after standing a few days, filter.

This is somewhat similar to the Diuretic Elixir, Buchu, Juniper, and Acetate of Potassium, which has been quite popular.

4064. Nephritic Compound.

Buchu Leaves, short,	12	ounces av.
Hydrangea Root,	12	ounces av.
Digitalis Leaves,	3	ounces av.
Juniper Berries,	8	ounces av.
Nitrate of Potassium,	3	ounces av.
Essence of Wintergreen,	1	fl.ounce.
Alcohol,	3	pints.

Water, sufficient to make a gallon.

Grind the drugs to a coarse powder, moisten them with sufficient Alcohol and Water mixed in equal quantities by measure, and

macerate for 24 hours, then transfer to a water-bath percolator, pack firmly, cover with a mixture of equal measures of Alcohol and Water, heat moderately and percolate with the same until the quantity of Alcohol which is directed has been used ; then add Water to the drugs, and continue the percolation, until one gallon of the percolate is obtained. Dissolve the Nitrate of Potassium in this and filter.

The dose is a dessertspoonful to a tablespoonful as a remedy for kidney troubles.

4065. **Kidney and Liverwort Tea.**

Liverwort, herb, cut,	8	ounces.
Dandelion Root, cut,	4	ounces.
Digitalis Leaves, cut,	$\frac{1}{2}$	ounce.
Hydrangea Root, cut,	2	ounces.
Wintergreen, herb, cut,	1	ounce.
Peppermint, herb, cut,	1	ounce.
Nitrate of Potassium, powder,	3	ounces.

Mix thoroughly, and put up in packages, holding about 2 ounces.

Directions for use : Steep the contents of the package in a quart of water, with gentle heat, for two hours, then strain off $1\frac{1}{2}$ pints, and add to it half a pint of alcohol and 2 ounces of sugar. Adult dose of this preparation a wine-glass full (1 fl.ounce), four times a day.

Kidneywort.—A proprietary medicine by this title is put up by Wells, Richardson & Co. of Burlington, Vt., both in a liquid and dry form. The dry Kidneywort is a mixture of drugs, as dandelion, hydrangea, etc., and extracts of other drugs, with roasted beans coarsely ground. The liquid contains the strength of similar medicinal ingredients.

LINIMENTS.

Proprietary preparations that are sold as Liniments may naturally be divided into two classes : A, those intended for internal and external use, and B, those intended for external use only. The former are used the same as the Balms and Pain Killers as general panaceas, and consist mostly of oils or volatile substances dissolved in Alcohol or similar solvents ; the latter are usually mixtures of volatile oil and substances with some fixed or mineral oil, and are used externally for pain, swellings, sores, etc.

The following formulæ are representatives of popular liniments. Others will be found under other headings throughout this work.

CLASS A. — For External and Internal Use.

4066. Arnica Liniment.

Arnica Flowers,	16	ounces av.
Smartweed Herb,	18	ounces av.
Marigold Flowers,	4	ounces av.
Oil of Sassafras,	3	fl.ounces.
Oil of Hemlock,	1	fl.ounce.
Oil of Origanum,	$\frac{1}{2}$	fl.ounce.
Camphor,	1	ounce av.
Alcohol,	7	pints.

Water, a sufficient quantity to make a gallon.

Reduce the drugs to a coarse powder and pack firmly in the water-bath percolator. Pour upon them 4 pints of alcohol, and macerate in a warm place for 24 hours, then heat very moderately for one hour, and begin to percolate slowly, adding first the remaining three pints of alcohol, and when it has disappeared from the surface continue the percolation with water until $7\frac{1}{2}$ pints have passed. To this percolate add the oils and the camphor and dissolve; filter if necessary. This is for external or internal use.

4067. Cocaine Liniment.

Hydrochlorate of Cocaine,	30	grains.
Oil of Hemlock,	1	fl.ounce.
Oil of Sassafras,	1	ounce.
Alcohol,	14	fl.ounces.

Mix and dissolve. The dose is 20 to 30 minims. It is also used externally for pains, etc.

4068. Eclectic Liniment.

Oil of Origanum,	2	fl.ounces.
Oil of Hemlock,	4	fl.ounces.
Oil of Turpentine,	4	fl.ounces.
Oil of Sassafras,	2	fl.ounces.
Oil of Amber,	$\frac{1}{2}$	fl.ounce.
Camphor,	2	ounces av.
Capsicum in fine powder,	1	ounce av.
Myrrh in fine powder,	1	ounce av.
Water of Ammonia,	4	fl.ounces.

Alcohol, sufficient to make a gallon.

Mix and macerate for 7 days, then filter.

For external or internal use.

4069. Indian Liniment.

Oil of Sassafras,	1 ounce.
Oil of Origanum,	1 ounce.
Oil of Pennyroyal,	1 ounce.
Oil of Hemlock,	1 ounce.
Tincture of Capsicum,	2 ounces.
Alcohol,	26 ounces.

Mix them. This is a popular general panacea for pain, colic, etc.
Dose 20 to 30 minims or more.

4070. Menthol Liniment.

Menthol,	1 ounce.
Tincture of Capsicum,	4 ounces.
Sulphate of Morphine,	30 grains.
Alcohol,	27 ounces.

Mix and dissolve. This is used externally for pain, rheumatism, headache, etc., and may be taken in doses of 20 to 30 minims.

4071. "Ready Relief."

Druggists have no right to use the title "Ready Relief" on their labels and wrappers, as it is claimed as proprietary by Radway & Co. This formula, however, makes a similar preparation.

Camphor,	3 ounces av.
Capsicum,	8 ounces av.
Oil of Turpentine,	2 fl.ounces.
Stronger Waters of Ammonia,	8 fl.ounces.
Alcohol,	1 gallon.

Mix and macerate for a week, shaking daily, then filter.

4072. Thymol-Chloral Liniment.

Thymol,	1 ounce.
Chloral Hydrate,	1 ounce.
Tincture of Capsicum,	4 ounces.
Alcohol,	26 ounces.

Mix, dissolve and filter. For rheumatism, pain, etc. Dose 20 to 30 minims when taken.

4073. Smartweed Compound or Extract.

Smartweed, leaves or herb,	20 ounces.
Alcohol,	6 pints.
Water,	2 pints.
Camphor,	6 drachms.
Oil Hemlock, } each,	1 ounce.
Oil Sassafras, }	

Grind the Smartweed to a coarse powder, and moisten it with 1 pint of the Alcohol; pack tightly in a percolator, and pour upon it the remaining Alcohol; cover closely and allow to stand four days; begin the percolation, and when no more Alcohol remains on top of drug, add the water. When the liquid has ceased to drop, press out what remains in the drug in the percolator, and add to the last portion.

In the 4 pints first obtained by percolation (before the Water is added to the drug in the percolator), dissolve the Camphor and Oils, and when the last portion of the percolate and that from the pressure is obtained, add it gradually to the portion in which the Oils, etc., have been dissolved, and filter, adding Alcohol enough to make 1 gallon. For external and internal use.

4074. Wizard Liniment.

Oil of Sassafras,	8 fl.ounces.
Oil of Cloves,	2 fl.ounces.
Oil of Turpentine,	4 fl.ounces.
Stronger Water of Ammonia,	1 fl.ounce.
Ether (Sulphuric),	4 fl.ounces.
Chloroform,	1 fl.ounce.
Camphor,	2 ounces av.
Alcohol sufficient to make a gallon.	

Mix and dissolve.

For internal or external use.

Under the title Wizard Oil, Wizard Liniment, Wizard Balm, Golden Relief, Golden Oil, and by many other similar names, a class of preparations for internal and external use are largely sold. In the preceding pages many good formulas for such preparations will be found under various titles. They are mostly compounds of aromatic oils with camphor and chloroform or ether, and act as prompt and diffusive remedies to relieve cramp, pain, colic. The profit on these preparations is large, and as they may readily be prepared there is no reason why druggists should not as well secure it to themselves as to pay it to others.

4075.

Eclectic Oil.

The following formula has been published as similar to Thomas'.

Camphor,	½ ounce.
Oil Gaultheria,	½ ounce.
Oil Origanum,	½ ounce.
Chloroform,	1 ounce.
Laudanum,	1 ounce.
Oil Sassafras,	1 ounce.
Oil Hemlock,	1 ounce.
Oil Turpentine,	1 ounce.
Balsam Fir,	1 ounce.
Tincture Guaiacum,	1 ounce.
Tincture Catechu,	1 ounce.
Alcohol,	4 pints.

Alkanet, sufficient to color.

Several other formulas are given in this work which make preparations similar to this.

CLASS B.—For External Use only.

4076.

Fluid Lightning.

Aconitia,	1 grain.
Essential Oil of Mustard,	1 drachm.
Glycerin,	1 ounce.
Alcohol,	4 ounces.

Mix.

This is a valuable external preparation for headache, neuralgia, rheumatism, and all nervous pains.

4077.

"Gargling Oil" Liniment.

Camphor,	8 ounces av.
Oil of Amber,	2 fl.ounces.
Origanum Oil,	1 fl.ounce.
Carbolic Acid,	4 ounces av.
Oil of Turpentine,	3 pints.
Crude Petroleum Oil,	4 pints.
Stronger Water of Ammonia,	2 fl.ounces.

Mix and dissolve.

This is somewhat like but we think a much better preparation than Gargling Oil.

4078. Iodide of Ammonium Liniment.

Iodine,	1	drachm.
Camphor,	½	ounce.
Oil Rosemary, } Oil Lavender, }	each,	2 drachms.
Water of Ammonia, q. s., or	1	ounce.
Alcohol,	1	pint.

Dissolve the Iodine in the Alcohol and add the Camphor and the Oils, then add Water of Ammonia enough to remove the dark color of the mixture, or change it to a light straw color.

4079. Mexican Liniment.

Olive Oil,	2	pints.
Camphor,	2	ounces.
Oil Origanum,	1	ounce.
Oil Sassafras,	1	ounce.
Water of Ammonia,	8	ounces.

Dissolve the Camphor in the Oils and mix well with the Water of Ammonia.

4080. Nerve and Bone Liniment.

Oil of Origanum,	1	fl.ounce.
Oil of Rosemary,	1	fl.ounce.
Oil of Amber,	1	fl.ounce.
Oil of Hemlock,	1	fl.ounce.
Camphor,	4	ounces av.
Oil of Turpentine,	3	pints.
Linseed Oil,	5	pints.

Mix and dissolve.

4081. Ready Oil Liniment.

Oil Origanum,	1	fl.ounce.
Oil Sassafras,	1	fl.ounce.
Oil Hemlock,	1	fl.ounce.
Oil Peppermint,	2	fl.drachms.
Chloroform,	4	fl.drachms.
Camphor,	1	ounce av.
Neutral Paraffin Oil,	12	fl.ounces.

Mix the Oils and dissolve the Camphor in the mixture. Cotton-Seed Oil or Linseed Oil may be used instead of the Paraffin Oil.

This is a good general Oil Liniment.

4082. Rheumatic Liniment.

Oil of Sassafras,	6 fl.ounces.
Oil of Origanum,	4 fl.ounces.
Oil of Cedar,	2 fl.ounces.
Oil of Amber,	1 fl.ounce.
Camphor,	8 ounces av.
Oil of Turpentine sufficient to make a gallon.	

Mix and dissolve.

This is said to be quite similar to the popular preparation known as "St. Jacob's Oil."

4083. "Spavin Cure."

This comes properly under the head of Liniments, but it is chiefly used in veterinary practice. It is, however, an excellent absorbent liniment for man or beast. An excellent application for swellings or lameness of any kind, but it must not be used internally.

Camphor,	4 ounces av.
Oil of Turpentine,	4 fl.ounces.
Tincture of Iodine,	4 fl.ounces.
Bichloride of Mercury,	30 grains.
Oil of Spike,	2 fl.ounces.
Oil of Amber,	2 fl.drachms.

Mix and dissolve.

4084. Veterinary Liniment.

Oil of Amber,	2 fl.ounces.
Camphor,	4 ounces av.
Carbolic Acid,	3 ounces av.
Oil of Tar,	2 fl.ounces.
Oil of Sassafras,	4 fl.ounces.
Oil of Turpentine,	2 pints.
Crude Petroleum,	5 pints.

Mix and dissolve.

NERVINES, HYPNOTICS AND SEDATIVES.

Nervines and Sedatives, as a class, do not have a large sale as proprietary medicines, which is rather strange considering the prevalence of nervous diseases. It is to be inferred that persons thus afflicted either apply to their physician, or purchase some nervine of their druggist with which they have become familiar.

It would seem from these conditions that there is a good opening for a proprietary nervine, which druggists may themselves prepare and put before their patrons.

Many formulas for such preparations are given throughout this work, but the following are calculated, particularly, to put up as proprietary :

4085.

Nervine Tonic.

Scullycap, in coarse powder,	8 ounces av.
Hops, in coarse powder,	8 ounces av.
Hyoscyamus, in coarse powder,	8 ounces av.
Valerian, in coarse powder,	8 ounces av.
Bromide of Ammonium,	4 ounces av.
Ether (Sulphuric),	4 fl.ounces.
Alcohol,	3 pints.
Sugar,	2 pounds av.
Water, sufficient to make	1 gallon.

Mix the powders, and having mixed the Alcohol with 3 pints of Water, pour upon them 2 pints of the liquid and macerate for 24 hours, in a warm place ; then transfer to the water-bath percolator, pack firmly, pour upon it the remaining Alcohol and Water, and set in a warm place for one day ; then heat very moderately, and after one hour begin to percolate, adding Water to the drugs when the liquid has disappeared from the surface, and continuing the heat and percolation until 7 pints have passed ; to this add the Ether and dissolve in the liquid, by agitation, the Bromide of Ammonium and Sugar. This is an excellent tonic nervine for general nervous depression and irritation, nervous headache, neuralgia, sleeplessness, epilepsy, etc.

The dose is from a teaspoonful to a tablespoonful, as required.

4086.

Nervine Elixir.

Bromide of Ammonium,	1 $\frac{1}{4}$ ounce av.
Valerianate of Ammonium,	$\frac{1}{4}$ ounce av.
Fluid Extract of Valerian,	1 fl.ounce.
Fluid Extract of Hyoscyamus,	1 fl.ounce.
Fluid Extract of Coca,	1 fl.ounce.
Syrup,	2 fl.ounces.
Elixir Simple, enough to make	1 pint.

Mix the liquids and dissolve the salts in the mixture ; after standing 24 hours filter. This is an excellent nervine and Anodyne

Elixir, for nervousness, pain, neuralgia, hysteria, and all "nervous" troubles.

Dose, from a teaspoonful to a tablespoonful, as required.

4087. Sedative Nervine Elixir.

Bromide of Potassium,	640	grains.
Sulphate of Morphine,	8	grains.
Valerianate of Ammonium,	256	grains.
Fluid Extract Valerian,	1	fl.ounce.
Fluid Extract Hops,	$\frac{1}{2}$	fl.ounce.
Water of Ammonia,	1	fl.drachm.
Syrup,	2	fl.ounces.
Elixir, simple, enough to make	1	pint.

Dissolve the salts in the Elixir and Syrup, add the Fluid Extracts and the Water of Ammonia, let stand a day or two and filter.

Dose, a teaspoonful to a dessertspoonful.

4088. Celery Compound.

Several preparations of Celery compounded with other Nervines have had a good sale as proprietary medicines, under various titles, as "*Celerina*," *Celery Cordial*, *Celery Compound*, etc.

The following formula will make a satisfactory preparation :

Celery Seed,	1	ounce av.
Coca Leaves,	1	ounce av.
Black Haw Bark,	1	ounce av.
Hyoscyamus Leaves,	$\frac{1}{2}$	ounce av.
Orange Peel,	2	drachms.
Sugar,	4	ounces.
Alcohol,	6	ounces.
Water, q. s., to make	1	pint.

Grind the drugs to a coarse powder, mix the Alcohol with 6 ounces of Water, pour upon the drugs enough of the diluted Alcohol to cover, and macerate for 24 hours; then heat moderately and percolate, adding Water through the percolator until 14 fl.ounces are obtained; in this dissolve the sugar and filter. The dose is a teaspoonful to a dessertspoonful or more as a nerve tonic.

4089. Chloral-Bromide Compound.

"*Bromidia*."

Under the title "*Bromidia*," which is claimed as a trade-mark, Battle & Co., Chemists, Corporation of St. Louis, Mo., have prepared and extensively sold a preparation intended to be used as a

nervine, sedative, and hypnotic. The following formula is based upon the quantitative composition of the preparation as published by them, but druggists are warned by them not to sell nor dispense any preparation other than their own as "Bromidia."

Chloral, crystallized,	4 ounces av.
Bromide of Potassium,	4 ounces av.
Extract Cannabis Indica,	16 grains.
Extract Hyoscyamus,	16 grains.
Water, sufficient to make	1 pint.

Dissolve the Extracts in 4 ounces of boiling Water, rub the solution with 1 drachm of Carbonate of Magnesium and filter. Dissolve the Bromide of Potassium in 8 ounces of boiling Water and add the Chloral, mix the solutions and add Water enough to make 1 pint. This may be colored a little with a few grains Extract of Liquorice if desired. Dose 15 to 30 drops.

4090. Bromides Compound.

A number of preparations of Bromides are sold as proprietary, as "Peacock's Bromides," and by other titles. The following formula makes a preparation similar to those found in the market.

Bromide of Potassium,	640 grains.
Bromide of Sodium,	640 grains.
Bromide of Ammonium,	384 grains.
Bromide of Calcium,	192 grains.
Bromide of Lithium,	64 grains.
Water,	8 fl.ounces.
Extract of Vanilla,	1 fl.ounce.
Sugar,	10 ounces av.

Rub the Bromides to a coarse powder. Mix the Water and Extract of Vanilla and dissolve the Salts in the mixture; filter and dissolve the Sugar in the filtrate by agitation.

Dose 1 to 2 fl.drachms in water.

4091. Chlorodyne.

Chloroform,	1 fl.ounce.
Fluid Extract Cannabis Indica,	1 fl.ounce.
Spirit of Ether,	1 ½ fl.ounce.
Tincture Opium deodorized,	1 ½ fl.ounce.
Hydrocyanic Acid (U. S. P.),	3 fl.drachms.
Oleoresin of Capsicum,	3 minims.

Dissolve the oleoresin in the Chloroform, add the Spirit of Ether, and mix.

4092.

Chlorodyne.

Chloroform,	4 fl.drachms.
Sulphuric Ether,	2 fl.drachms.
Hydrocyanic Acid (U. S. P.),	4 fl.drachms.
Tincture Capsicum,	4 fl.drachms.
Mucilage Acacia,	1 fl.ounce.
Sulphate of Morphine,	20 grains.
Oil of Peppermint,	8 minims.
Treacle (Molasses),	4 fl.ounces.

Mix the Chloroform with the Mucilage Acacia, add the Oil of Peppermint and Syrup and shake them well together. Dissolve the Sulphate of Morphine in the Tincture of Capsicum, and add to the mixture, and lastly add the Hydrocyanic Acid and mix. This is quite similar to the popular English Brown's Chlorodyne. It must be shaken before taking. The dose is 10 to 20 minims.

4093.

Chlorodynia.

Sulphate of Morphine,	15 grains.
Chloroform,	1 fl.ounce.
Alcohol,	1 fl.ounce.
Fluid Extract Cannabis Indica,	1 fl.ounce.
Glycerin,	1 fl.ounce.
Hydrocyanic Acid, U. S. P.,	15 minims.
Peppermint Essence,	15 minims.

Mix the liquids and dissolve the Morphine Salt in the mixture. This is one of the best forms of Chlorodyne, as it makes a clear preparation, not required to be shaken when taken. The dose is 10 to 30 minims.

OINTMENTS AND SALVES.

The sales of proprietary salves and ointments are perhaps as frequent as of almost any class of proprietary medicines; and, although but few sell for more than twenty-five cents, the aggregate of sales is large. A great variety of these remedies are on the market; but, with the exception of a very few, the public are not particular as to the preparation they have, provided, only, it is good for the purpose. Druggists can, therefore, put up their own ointments and salves from reliable formulæ, and if the preparation is good, and the

packages attractive, can secure most of the sales of such articles for their own preparations.

Many formulas are given under other headings. The following are representatives of other popular ointments.

4094. **Camphor Ice.**

Paraffin,	8 ounces av.
White Petrolatum,	24 ounces av.
Camphor,	6 ounces av.
Oil of Neroli,	5 minims.
Oil of Bitter Almond,	20 minims.
Oil of Cloves,	10 minims.

Melt the Paraffin and Petrolatum together, reduce the Camphor to a coarse powder and dissolve it in the melted mixture, keeping at as low a temperature as it can be without solidifying. When all is dissolved strain while still fluid, add the perfuming oils and run in molds.

4095. **Carbolic Salve or Ointment.**

Carbolic Acid (crystals),	1 ounce av.
Yellow Wax,	2 ounces av.
Petrolatum,	16 ounces av.

Melt the Wax and the Petrolatum together, and when cooling add the Carbolic Acid, and mix them well together. This is a simple Carbolic Ointment or Salve, useful for all purposes. Other medicinal agents are frequently added, as Canada Balsam, or White Pine Turpentine, say one ounce, to make it more stimulating for old sores, etc.; but the plain Carbolic Salve, as above prepared, meets the general requirement. This is a very popular preparation, and has only to be put up attractively to sell.

4096. **Golden Ointment.**

Oil of Origanum,	2 fl.drachms.
Oil of Sassafras,	2 fl.drachms.
Balsam of Fir,	$\frac{1}{2}$ fl.ounce.
Citrine Ointment,	4 ounces av.
Yellow Wax,	1 ounce av.
Petrolatum,	10 ounces av.

Melt the solid ingredients together, and when cooling add the Oils and Balsam, mixing them well together.

4097. Healing Ointment.

White Pine Turpentine,	1 ounce av.
Oil of Rosemary,	2 fl.drachms.
Oil of Sassafras,	2 fl drachms.
Yellow Wax,	1 ounce av.
Petrolatum,	16 ounces av.

Mix the solid ingredients together, and when cooling add the Oils.

4098. Itch Ointment.

Lac Sulphur,	2 ounces av.
Naphthalin,	60 grains.
Oil Bergamot,	20 minims.
Petrolatum,	6 ounces.

Rub the Lac Sulphur to a fine powder and sift it into the melted Petrolatum, stirring them well together, and when nearly cool add the Naphthalin and Oil of Bergamot, stirring them well together until cold. The same may be made without Naphthalin, if desired.

Red Precipitate Ointment is also much employed for the itch and other parasitic skin diseases. This is usually made with Red Precipitate 1 ounce, Venice Turpentine 1 ounce, Yellow Wax 1 ounce, Petrolatum 9 ounces.

4099. Menthol Ointment.

Menthol,	1 ounce av.
Yellow Wax,	1 ounce av.
Petrolatum,	6 ounces av.

Melt the Wax and Petrolatum, and when cooling add the Menthol and mix thoroughly.

4100. Pile Ointment.

Powdered Nutgalls,	1 ounce av.
Powdered Opium,	1 drachm.
Powdered Myrrh,	2 drachms.
Goulard's Extract,	4 fl.drachms.
Yellow Wax,	2 ounces.
Petrolatum,	16 ounces.

Melt the Wax and Petrolatum, and while cooling add the other ingredients, with constant stirring until cold.

4101. Salt Rheum Ointment.

Oil of Sassafras,	2	fl.drachms.
Oil of Hemlock,	1	fl.drachm.
Oil of Rosemary,	1	fl.drachm.
Pine Tar,	½	ounce av.
Salicylic Acid,	2	drachms.
White Pine Turpentine,	1	ounce.
Solution Subacetate of Lead,	½	fl.ounce.
Petrolatum,	16	ounces.

Melt the solid ingredients together and while cooling incorporate the Oils, Tar and Solution of Lead, stirring them well together until cold.

4102. Skin Ointment.

This ointment is designed for any kind of skin eruption or "Eczema" as it is popularly termed. For parasitic diseases, however, the Itch or Tetter Ointment will be more efficacious.

Tincture of Benzoin, Compound,	2	fl.drachms.
Juniper Tar,	1	fl.ounce.
Salicylic Acid,	2	drachms.
Resin,	1	ounce av.
Oil of Rosemary,	2	fl.drachms.
Carbolic Acid,	1	drachm.
Petrolatum,	16	ounces av.

Melt the solid ingredients, and while cooling add the liquids.

4103. Tetter Ointment.

Carbonate of Lead,	1	ounce av.
Alum, in fine powder,	1	ounce av.
Calomel,	1	ounce av.
White Pine Turpentine,	1	ounce av.
Salicylic Acid,	2	drachms.
Petrolatum,	12	ounces av.

Melt the Petrolatum and Turpentine together, and when cooling add the other ingredients previously mixed, and stir them together constantly until cold.

4104. Thymol Ointment.

Thymol,	1	ounce av.
Yellow Wax,	2	ounces av.
Petrolatum,	16	ounces av.

Melt the Wax and Petrolatum together, and when cooling add the Thymol, stirring them well together.

4105. Veterinary Ointment.

Citrine Ointment,	2 ounces av.
Oil Sassafras,	$\frac{1}{2}$ fl.ounce.
Resin,	1 ounce av.
Petrolatum, dark,	16 ounces av.

Melt the Petrolatum and Resin together, and while cooling add the Citrine Ointment and Oil of Sassafras.

PECTORALS.

Pectorals might very properly be classed under Cough Remedies, but as there are a few preparations known more particularly as Pectorals, they are included under this heading.

4106. Cherry Pectoral.

Acetate of Morphine,	6 grains.
Tincture of Sanguinaria,	4 fl.drachms.
Wine of Ipecac,	6 fl.drachms.
Wine of Antimony,	6 fl.drachms.
Fluid Extract of Wild Cherry,	2 fl.ounces.
Oil Bitter Almond,	5 drops.
Hydrocyanic Acid, U. S. P.,	1 fl.drachm.
Alcohol,	2 fl.ounces.
Syrup, sufficient to make	1 pint.

Mix, and after standing a few days filter clear.

This preparation is quite similar to Ayer's. The dose is 15 drops to 1 teaspoonful.

4107. Pectoral Drops. Bateman's.

Tincture of Opium, Camphorated,	10 fl.ounces.
Tincture of Castor,	4 fl.ounces.
Tincture of Opium,	1 fl.ounce.
Tincture of Cochineal,	$\frac{1}{2}$ fl.ounce.
Oil of Anise,	15 drops.

Mix them. This is supposed to be the original formula. The Philadelphia College of Pharmacy give the following formula as a substitute: Camphor, Catechu, powdered Opium and Red Saunders Wood, each 2 ounces av., Oil of Anise 4 fl.drachms, proof Spirit 4 gallons. Digest 10 days and filter.

4108. Pectoral or Cough Pills.

Ipecac, in powder,	100 grains.
Squill, in powder,	50 grains.
Sulphate of Morphine,	3 grains.
Tartar Emetic,	6 grains.
Extract Hyoscyamus,	100 grains.

Make 100 pills. The dose is one or two pills.

4109. Pectoral Tea or Hamburg Tea.*Brust-Thee.*

Althæa Root, cut,	4 ounces.
Liquorice Root, cut,	1 ounce.
Mullein Leaves, cut,	4 ounces.
Senna Leaves, cut,	1 ounce.
American Saffron,	$\frac{1}{4}$ ounce.
Malva Flowers, cut,	3 ounces.
Blue Flowers (Asters or Bachelor Button),	$\frac{1}{4}$ ounce.
Fennel Seed, bruised,	$\frac{1}{2}$ ounce.
Anise Seed, bruised,	$\frac{1}{2}$ ounce.
Granulated Sugar,	$\frac{1}{2}$ ounce.

Mix them thoroughly. This is usually put up in packages of about 2 ounces, a tablespoonful being steeped in two or three cups of boiling Water, and the infusion drank freely for influenza and colds.

PILLS, PLASTERS AND POWDERS.

So many formulas for pills have been given under other headings that it will be unnecessary to give any more in this department, druggists will be able to select such as they wish from the formulas already given. The manufacture of spread plasters is seldom attempted except by those who have establishments and machinery specially adapted for the purpose. There is now but little sale for sticking salves and plasters, and sufficient formulas for them will be found under the heading "Emplastra." The formulas for powders will be found under other headings, the Condition Powders being the most important.

RHEUMATIC REMEDIES.

Proprietary remedies for Rheumatism, which are to be taken, are quite salable preparations, and the market is not so overstocked with them as with some other remedies. The following formulæ are representative of the various kinds.

4110. Rheumatic Remedy.

Salicylate of Sodium,	4 ounces av.
Iodide of Potassium,	2 ounces av.
Nitrate of Potassium,	3 ounces av.
Fluid Extract of Black Cohosh,	4 fl.ounces.
Fluid Extract of Colchicum,	4 fl.ounces.
Oil of Wintergreen,	3 fl.drachms.
Sugar,	1 pound av.
Water,	5 pints.
Alcohol,	2 pints.

Mix the Oil of Wintergreen and the Fluid Extract with the Alcohol. Dissolve the Salts and the Sugar in the Water, mix the solution and allow to stand over night, then filter clear. This is an excellent remedy, the dose is 1 to 2 teaspoonfuls.

4111. Favorite Rheumatic Remedy.

Iodide of Potassium,	1 ounce av.
Fluid Extract of Colchicum,	1 fl.ounce.
Spirit of Nitre,	3 fl.ounces.
Syrup Sarsaparilla, compound,	1 pint.
Gin or Whisky,	12 fl.ounces.

Formulas similar to this are popular, and very good results are usually obtained from their use. The dose is a teaspoonful to a dessertspoonful.

4112. Salicylica Rheumatic Remedy.

Salicylic Acid,	8 ounces av.
Bicarbonate of Sodium,	5 ½ ounces av.
Nitrate of Potassium,	3 ounces av.
Tincture of Colchicum Seed,	8 fl.ounces.
Oil of Wintergreen,	2 fl.drachms.
Syrup,	2 pints.
Alcohol,	2 pints.
Water, sufficient to make	1 gallon.

Mix the Salicylic Acid with 2 pints of Water in a gallon bottle and gradually add the Bicarbonate of Sodium in small portions, at

intervals of a few moments, giving time for the effervescence to subside before adding more. When all has been dissolved (which will require about 2 hours), add the Alcohol in which the Wintergreen Oil has been dissolved, and then the tincture and Syrup, and lastly the Nitrate of Potassium and sufficient Water to make a gallon; after standing filter. Dose, a dessertspoonful.

4113. Salol Rheumatic Remedy.

Salol,	128 grains.
Iodide of Potassium,	256 grains.
Bicarbonate of Potassium,	128 grains.
Elixir,	1 pint.

Mix and dissolve.

Dose a dessertspoonful.

4114. Rheumatic Elixir.

Iodide of Potassium,	1 ounce av.
Salicylate of Sodium,	1 ounce av.
Wine of Colchicum Seed,	2 ounces av.
Elixir, sufficient to make	1 pint.

Mix and dissolve. Dose, from a dessertspoonful to a table-spoonful.

4115. Rheumatic Cure.

Acetate of Potassium,	2½ ounces av.
Wine of Colchicum,	2 fl.ounces.
Elixir, sufficient to make	1 pint.

Mix and dissolve. Dose from a teaspoonful to a tablespoonful.

4116. Rheumatic Bitters — Powder.

Colchicum Root, in fine powder,	4 ounces.
Black Cohosh Root, in fine powder,	4 ounces.
Prickly-Ash Bark, in fine powder,	½ ounce.
Cinnamon Bark, in fine powder,	½ ounce.
Iodide of Potassium, in fine powder,	1 ounce.
Nitrate of Potassium, in fine powder,	1 ounce.

Mix thoroughly and put up in packages or boxes of about 1 ounce. The contents of the package to be added to a quart of gin.

4117. Rheumatic Remedy — Tea.

Black Cohosh Root, cut fine,	6 ounces.
Colchicum Root, cut fine,	4 ounces.
Sassafras Bark, cut fine,	2 ounces.
Prickly-Ash Bark, cut fine,	1 ounce.
Juniper Berries, crushed,	1 ounce.
Nitrate of Potassium, in powder,	2 ounces.

Mix thoroughly and put up in packages of about 2 ounces, which is sufficient for a quart of liquid medicine. It may be added to a quart of Gin or Diluted Alcohol.

SARSAPARILLA COMPOUNDS.

Of all proprietary medicines the Sarsaparilla Compounds have the largest sale. They are put up under various names and titles, as alteratives, blood purifiers, blood searchers, blood cleansers, medical discoveries, resolvents, etc., but are best known and most frequently sold under the name of "Sarsaparilla," although this is considered medicinally the least valuable of the drugs composing the preparation. In the preceding pages many good formulas for Sarsaparilla preparations suitable for putting up will be found under other headings.

The following are also given as representative of preparations of this kind found in the market as proprietary medicines.

4118. Sarsaparilla Compound.

With Iodide of Potassium.

This is one of the best and most common Sarsaparilla preparations.

Sarsaparilla, in No. 30 powder,	8 ounces av.
Stillingia, in No. 40 powder,	8 ounces av.
Burdock Root, in No. 30 powder,	3 ounces av.
Blue Flag Root, in No. 20 powder,	1½ ounces av.
Mandrake Root, in No. 50 powder,	1½ ounces av.
Senna Leaves, in No. 20 powder,	1½ ounces av.
Prickly-Ash Bark, in No. 50 powder,	¾ ounce av.
Iodide of Potassium,	1 ounce av.
Sarsaparilla Flavoring,	1 fl.ounce.
Diluted Alcohol,	4 pints.
Sugar,	5 pounds av.
Water, a sufficient quantity to make	1 gallon.

Mix the drugs, moisten them with 2 pints of Diluted Alcohol and macerate for 24 hours; transfer to the water-bath percolator, pack moderately, pour upon them 2 pints of Diluted Alcohol and set in a warm place for 24 hours; then heat moderately, and after one hour begin to percolate adding Water to the drugs after the liquid has ceased to drop and continuing the heat and percolation until five pints are obtained. To this add the Sarsaparilla Flavoring and Iodide of Potassium, and after standing 24 hours filter, adding through the filter enough Water to make 5 pints. In this dissolve the Sugar and add enough Water to make 1 gallon. A larger quantity of Iodide of Potassium may be added if desired.

4119. Concentrated Extract of Sarsaparilla Compound.

This formula makes a preparation similar to the stronger Sarsaparilla compounds that are found in the market, like Ayer's and other similar preparations.

Fluid Extract Sarsaparilla, Honduras,	4	fl.ounces.
Fluid Extract Yellow Dock,	4	fl.ounces.
Fluid Extract Stillingia,	3	fl.drachms.
Fluid Extract Mandrake,	2	fl.drachms.
Sugar,	1 ½	ounce.
Iodide of Potassium,	100	grains.
Iodide of Iron,	10	grains.
Alcohol,	4	fl.ounces.
Water, sufficient to make	1	pint.

Mix, dissolve and filter. The dose is from half to a teaspoonful

The weaker Sarsaparilla compounds may be made from this by diluting it with 3 parts by measure of Syrup.

4120. Sarsaparilla, Stillingia and Red Clover Extract.

Sarsaparilla,	8	ounces av.
Stillingia,	8	ounces av.
Red Clover Tops,	8	ounces av.
Mezereum Bark,	1	ounce av.
Sassafras Bark,	1	ounce av.
Iodide of Potassium,	1	ounce av.
Sarsaparilla Flavoring,	1	fl.ounce.
Diluted Alcohol,	6	pints.
Sugar,	4	pounds.

Water, sufficient to make a gallon.

Make as directed in the preceding formula.

Dose, a teaspoonful to a dessertspoonful.

Sarsaparilla Resolvent.

A few proprietary preparations found in the market are known as Resolvents. They are mostly compounds of Sarsaparilla with a considerable quantity of Iodide of Potassium or Potassa Alkali, and are known as Cuticura, Resolvent, Ready Resolvent, etc.

One sample formula will suffice.

Sarsaparilla, Honduras,	8	ounces av.
Stillingia,	8	ounces av.
Burdock Root,	8	ounces av.
Sassafras Bark,	2	ounces av.
Blue Flag Root,	2	ounces av.
Prickly-Ash Bark,	$\frac{1}{2}$	ounce av.
Iodide of Potassium,	1	ounce av.
Bicarbonate of Potassium,	1	ounce av.
Sarsaparilla Flavoring,	$\frac{1}{2}$	ounce av.
Diluted Alcohol,	6	pints.
Sugar,	3	pounds av.
Water, sufficient to make a gallon.		

Grind the drugs to a coarse powder and percolate by water-bath percolation, first with the diluted alcohol, then with enough Water to make $6\frac{1}{2}$ pints of the percolate, add the flavoring, and the salts, and the sugar, and after standing filter. The dose is a dessert-spoonful.

4221.

Medical Discovery.

Under this title several Alterative and Sarsaparilla compounds have been extensively sold as blood purifiers, etc. The following will suffice for all.

Sarsaparilla, Mexican,	8	ounces.
Yellow Dock Root,	8	ounces.
Blue Flag Root,	4	ounces.
Yellow Parilla,	2	ounces.
Leptandra Root,	1	ounce.
Sarsaparilla Flavoring,	$\frac{1}{2}$	ounce.
Iodide of Potassium,	2	ounces.
Sugar,	4	pounds.
Diluted Alcohol,	6	pints.
Water, sufficient to make	1	gallon.

Grind the drugs to a coarse powder and percolate by water-bath percolation, first with the Diluted Alcohol and then with Water

until 6 pints are obtained, then add the Sarsaparilla Flavoring and Iodide of Potassium and filter, afterwards dissolving the Sugar in the filtrate, and making up the measure with Water to 1 gallon.

The dose is a teaspoonful to a tablespoonful.

Iodide of Mercury $\frac{1}{2}$ ounce may be used instead of Iodide of Potassium.

SOOTHING AND TEETHING SYRUPS.

The sale for proprietary Soothing Syrups and like preparations is quite extensive, and there are but comparatively few makes on the market. The following formulæ make preparations similar to those in use and others quite different from any to be found.

4122. Baby-Soother, or Soothing Syrup.

Tincture of Hyoscyamus,	8 fl.ounces.
Fluid Extract of Senna,	2 fl.ounces.
Oil of Anise,	3 fl.drachms.
Chloroform,	30 minims.
Alcohol,	10 fl.ounces.
Water,	4 pints.
Sugar,	6 pounds av.

Dissolve the Oil of Anise and Chloroform in the Alcohol, and mix with the tincture and fluid extract add the Water, filter clear and dissolve the Sugar in the filtrate by agitation. This is a quieting, slightly laxative Syrup and contains nothing injurious to children. It may be further improved by adding to it 1 pint of Syrup, Lacto-phosphate of Lime, which supplies to the blood the required nutrition during the critical period of dentition.

From $\frac{1}{4}$ to a teaspoonful may be given at a dose.

4123. Soothing Syrup.

Rochelle Salts,	1 $\frac{1}{3}$ ounces.
Sulphate of Morphine,	6 grains.
Extract Jamaica Ginger,	$\frac{1}{2}$ ounce.
Essence of Anise (1 part Oil of Anise to 16 parts Alcohol),	1 ounce.
Sugar,	13 ounces.
Water,	8 ounces.
Carbonate Magnesium,	1 drachm.

Mix the Extract Ginger and Essence Anise, and rub them with the Carbonate Magnesium, in a mortar, to a smooth paste; add the

Water a little at a time, and rub thoroughly ; filter, and dissolve the Morphine first, and then the Rochelle Salts in the filtrate ; when dissolved filter, if necessary, and dissolve the Sugar in the liquid by agitation.

Dose, $\frac{1}{4}$ to 1 teaspoonful.

4124.

Quieting Syrup.

Lactucarium,	256	grains.
Extract Ginger,	$\frac{1}{2}$	ounce.
Essence Anise,	1	ounce.
Sugar,	13	ounces.
Hot Water,	8	ounces.
Rochelle Salts,	$1\frac{1}{3}$	ounces.

Rub the Lactucarium with the Hot Water in a mortar, and add the Rochelle Salts, allow to macerate with occasional agitation for twenty-four hours, then add the Ginger and Anise to the Sugar, and shake thoroughly together, and dissolve in the liquid by agitation. When dissolved, strain.

Dose, $\frac{1}{2}$ to 1 teaspoonful.

4125.

Rhubarb Soothing Syrup.

Rhubarb,	8	ounces.
Anise Seed,	3	ounces.
Jamaica Ginger,	2	ounces.
Poppy Leaves,	4	ounces.
Bicarbonate Potassium,	2	ounces.
Water, q. s., to make	$4\frac{1}{2}$	pints.
Sugar (avoirdupois weight),	7	pounds.

Grind the drugs to a coarse powder. Dissolve the Bicarbonate Potassium in the Water and moisten the drugs with it ; pack in a percolator, and pour the Water upon the drugs ; macerate for two days, and begin the percolation ; percolate until $4\frac{1}{2}$ pints are obtained, adding enough Water through the percolator to make that quantity. Dissolve the Sugar in the percolate by agitation or gentle heat, and strain.

Dose, $\frac{1}{4}$ to 1 teaspoonful.

This is a harmless Soothing Syrup, well suited to neutralize the acid stomach and to correct the bowel difficulties incident to teething.

4126. Nutritive Soothing Syrup.

Sulphate of Morphine,	6 grains.
Syrup of Lacto-phosphates, compound, . . .	15 ounces.
Water,	1 ounce.

Dissolve the Morphine in the Water, and add to the Syrup.

Dose, $\frac{1}{2}$ to 1 teaspoonful.

This is an excellent compound for teething babies.

4127. Malt Soothing Syrup.

Sulphate of Morphine,	6 grains.
Water,	1 ounce.
Compound Syrup of Hypophosphites, }	each, $7\frac{1}{2}$ ounces.
Liquid Extract Malt, }	

Dissolve the Morphine in the Water and mix with the Extract of Malt, then mix the Syrup Hypophosphites

Dose, $\frac{1}{2}$ to 1 teaspoonful.

The same remarks apply to this as to No. 4, the addition of Malt being of much service.

SALTS.

A few preparations in the form of Salts have a good sale as proprietary medicines. The following are representative of those found in the market, others will be found under other headings.

4128. Seltzer Aperient.

Sulphate of Magnesium dried,	2 ounces.
Rochelle Salt, dry,	2 ounces.
Tartaric Acid, dry,	6 ounces.
Bicarbonate of Sodium,	$6\frac{1}{2}$ ounces.

Mix them thoroughly and put up in dry bottles.

It is necessary that the Sulphate of Magnesium (Epsom Salts) should be thoroughly dried by heating on a sand bath in a porcelain vessel for a considerable time until it has lost its Water of crystallization.

The dose is a teaspoonful or two in part of a glass of Water.

4129. Fruit or Grape Salt.

Several preparations under various titles as *Fruit Salt*, *Grape Salts*, *Fruit Saline*, *Sal Muscatel*, etc., are put up as laxatives and restoratives. The following formula will suffice for all :

Bicarbonate of Sodium,	6 ounces.
Tartaric Acid,	2 ounces.
Cream of Tartar,	10 ounces.
Rochelle Salt,	4 ounces.
Sugar,	1 ounce.
Oil Lemon,	30 minims.
Oil Orange,	20 minims.
Oil Limes,	20 minims.

Mix the Oils with a small portion of the Rochelle Salt, and then with the remainder, and incorporate this thoroughly, first with the Cream of Tartar and then with the Bicarbonate of Sodium and put up in dry bottles.

4130. Crab-Orchard Salts.

Sulphate of Magnesium,	2 ounces.
Sulphate of Sodium,	2 ounces.
Cream of Tartar,	2 ounces.
Tartaric Acid,	2 ounces.
Bicarbonate of Sodium,	2 ounces.
Sugar,	4 ounces.

Dry the salts and mix them well together and put up in dry bottles.

4131. Carlsbad Salts, Artificial.

Chloride of Sodium,	1 ounce.
Bicarbonate of Sodium,	3 ounces.
Sulphate of Sodium, dried,	10 ounces.

Mix them thoroughly and put up in dry bottles.

The Sulphate of Sodium must be dried by heating on a sand-bath until its Water of crystallization has evaporated and it is reduced to a dry powder.

This may also be prepared by dissolving the salts altogether in water and evaporating to a granular salt.

This is given as a laxative in doses of a teaspoonful in part of a glass of Water.

SPECIFICS.

A few proprietary medicines are known as Specifics. The name is applied to medicines of various kinds, for asthma, catarrh, dyspepsia, gout, rheumatism, malaria, etc., but is more particularly understood to apply to remedies for Syphilis, and these only will be considered under this heading, as they are not given elsewhere except generally under alteratives, sarsaparillas, etc.

4132.

S. S. Specific.

Fluid Extract of Stillingia,	8	fl.ounces.
Fluid Extract of Blue Flag,	2	fl.ounces.
Fluid Extract of Prickly-Ash,	1	fl.ounce.
Iodide of Potassium,	1	ounce av.
Iodide of Calcium,	$\frac{1}{2}$	ounce av.
Diluted Alcohol, sufficient to make	1	pint.

Dissolve the Iodides in the Diluted Alcohol and mix the solution with the fluid extracts. The dose is a teaspoonful to a dessertspoonful.

4133.

Rex Magnus Specific.

Iodide of Calcium,	1	ounce av.
Iodide of Potassium,	1	ounce av.
Tincture of Iodine,	1	fl.ounce.
Essence of Wintergreen,	1	fl.drachm.
Alcohol,	4	fl.ounces.
Syrup,	4	fl.ounces.
Water, sufficient to make	1	pint.

Mix and dissolve. The dose is a teaspoonful to a dessertspoonful, which should be taken alternately with the following :

Fluid Extract Stillingia,	6	ounces.
Fluid Extract Sarsaparilla, Honduras,	4	ounces.
Fluid Extract Yellow Dock,	4	ounces.
Fluid Extract Prickly Ash,	1	ounce.
Fluid Extract Blue Flag,	1	ounce.
Fluid Extract Mandrake,	4	drachms.

Mix them. The dose is a teaspoonful to a dessertspoonful, to be taken alternately with the foregoing.

The latter part of this preparation is entirely unlike the proprietary "Rex Magnus," but is believed to be much better as an alterative in connection with the solution of Iodides, etc.

TONICS.

A great many tonic preparations for various uses are included under other headings in the preceding pages, therefore only a few which are more particularly known in the market as tonics will be mentioned here.

4134. Beef and Coca Tonic.

Elixir Beef and Coca.

Liebig's Extract of Meat,	½ ounce av.
Fluid Extract of Coca,	1 fl.ounce.
Elixir,	15 fl.ounces.

Rub the Meat Extract with the Elixir, add the Fluid Extract, and after standing filter.

To make *Beef, Coca and Iron Tonic* or Elixir, add to the foregoing ½ ounce Solution Phosphate of Iron. If Quinine is desired in the preparation 32 grains may be dissolved in a pint of either the Beef and Coca, or the Beef, Coca and Iron.

The dose of these preparations is a teaspoonful to a tablespoonful.

4135. German Tonic.

Tincture of Cinchona,	2 fl.ounces.
Tincture of Gentian Compound,	1 fl.ounce.
Tincture of Capsicum,	1 fl.drachm.
Fluid Extract of Golden Seal,	2 fl.drachms.
Sugar,	4 ounces av.
Brandy,	6 fl.ounces.
Cinnamon Water,	5 fl.ounces.

Mix. Dissolve the Sugar in the mixture and after standing filter. This is a general tonic; the formula may be varied as desired. Dose, a dessertspoonful to a tablespoonful.

4136. Ginger Tonic.

Jamaica Ginger, in powder,	2 ounces av.
Gentian, in coarse powder,	¼ ounce av.
Cinnamon, in coarse powder,	1 drachm.
Bitter Orange Peel, in coarse powder,	¾ ounce.
Golden Seal, in coarse powder,	¼ ounce.
Carbonate of Magnesium,	¼ ounce.

Sugar,	2	ounces.
Alcohol,	6	fl.ounces.
Diluted Alcohol, a sufficient quantity.		
Water, sufficient to make	1	pint.

Macerate the powdered drugs first with the Alcohol in a wide mouth bottle for 5 days, then add 6 fl.ounces of Water, and let stand 5 days more with daily agitation, then pour off the fluid portion and percolate the drugs with sufficient diluted Alcohol to make when added to the poured-off liquid 16 fl.ounces, rub this with the Carbonate of Magnesium in a mortar, filter and dissolve the Sugar in the filtrate.

This may also be made by mixing Soluble Extract of Ginger (943) 4 fl.ounces with Tincture Gentian Compound 2 fl.ounces, Aqueous Fluid Extract Golden Seal 2 fl.drachms, Sugar 2 ounces, Alcohol, Water, each 5 fl.ounces.

The dose is a teaspoonful to a dessertspoonful.

4137. Iron Tonic.

A great variety of Iron Tonics will be found among the elixirs, bitters, wines, etc., but the following general formula is submitted.

Sulphate of Quinine,	40	grains.
Sulphate of Cinchonidine,	80	grains.
Sulphate of Strychnine,	4	grains.
Fluid Hydrastis (1576),	4	fl.ounces.
Tincture of Gentian, compound,	8	fl.ounces.
Tincture of Iron, tasteless (1923),	4	fl.ounces.
Soluble Elixir Flavoring (510),	4	fl.ounces.
Sugar,	2	pounds.
Alcohol,	2	pints.
Water, sufficient to make	1	gallon.

Dissolve the Salts in the Alcohol, mix the other ingredients with 4 pints of Water, and when the Sugar is dissolved mix the two solutions, and after standing filter. This may be colored brown, or reddish brown, with caramel and red coloring, if desired. The dose is a dessertspoonful or more.

Any of the Iron Bitters or Bitter Wines of Iron or Elixirs of Bark and Iron may be put up under this title. The proprietors of *Brown's Iron Bitters* have endeavored to intimidate the retail druggists by claiming a proprietary right to the title Iron Bitters, or Iron Tonic, and that no other preparations by similar names could be sold; but this claim cannot, of course, be maintained, and any druggist may put up an Iron Bitters or Iron Tonic.

TOOTH-ACHE REMEDIES.

Perhaps there is nothing in the line of remedies for which there is a more general call than tooth-ache cures or remedies, and it is certainly convenient and profitable to have something put up ready for this trade. As special proprietary preparations of this kind are seldom designated, it is obvious that the druggist may supply any good remedy for the purpose.

The following formulas will give satisfaction. These same remedies may also be used for ear-ache, neuralgia, etc.

4138. Camphor-Chloral Tooth-ache Cure.

Camphor,	I	ounce av.
Chloral Hydrate,	I	ounce av.
Chloroform,	I	fl.ounce.
Ether (Sulphuric),	I	fl.ounce.
Tincture of Opium,	$\frac{1}{2}$	fl.ounce.
Oil of Thyme (Origanum pure),	$\frac{1}{2}$	fl.ounce.
Oil of Sassafras,	$\frac{1}{2}$	fl.ounce.
Alcohol,	16	fl.ounces.

Mix and dissolve, saturate a little cotton and insert it in the cavity, also rub on the gums.

4139. Carbolic Tooth-ache Cure.

Carbolic Acid,	5	ounces av.
Camphor,	8	ounces av.
Oil of Sassafras,	$\frac{1}{2}$	fl.ounce.
Oil of Cloves,	$\frac{1}{2}$	fl.ounce.
Chloroform,	I	fl.ounce.

Mix and dissolve, moisten cotton and put in the cavity of the tooth, and rub around the gums if necessary.

This is an efficient and prompt tooth-ache remedy.

4140. Clove Anodyne, Tooth-ache Cure.

Oil of Cloves,	2	fl.ounces.
Carbolic Acid,	$\frac{1}{2}$	ounce av.
Oil of Peppermint,	2	fl.drachms.
Sulphate of Morphine,	30	grains.
Alcohol,	13	fl.ounces.

4141. Cajuput Tooth-ache Remedy.

Sulphate of Morphine,	30 grains.
Camphor,	1 ounce av.
Chloroform,	1 fl.ounce.
Oil of Peppermint,	2 fl.drachms.
Oil of Cajuput,	4 fl.ounces.
Alcohol,	10 fl.ounces.

4142. Lightning Tooth-ache Remedy.

Essential Oil of Mustard,	1 fl.ounce.
Chloroform,	2 fl.ounces.
Oil of Sassafras,	1 fl.ounce.
Alcohol,	12 fl.ounces.

4143. Cocaine Tooth-ache Cure.

Cocaine Hydrochlorate,	60 grains.
Oil of Wintergreen,	2 fl.drachms.
Oil of Peppermint,	2 fl.drachms.
Alcohol,	15 fl.ounces.

4144. Menthol Tooth-ache Remedy.

Menthol,	1 ounce av.
Chloroform,	1 fl.ounce.
Alcohol,	14 fl.ounces.

4145. Thymol Tooth-ache Remedy.

Thymol,	1 ounce av.
Chloroform,	1 fl.ounce
Alcohol,	14 fl.ounces.

4146. Aseptol Tooth-ache Remedy.

Aseptol,	1 ounce av.
Chloroform,	1 fl.ounce.
Alcohol,	14 fl.ounces.

4147. Salicylic Tooth-ache Cure.

Collodion,	1 pint.
Salicylic Acid,	2 ounces.

Dissolve the Salicylic Acid in the Collodion. This forms a plug in the cavity of the tooth, thus covering the exposed nerve.

WORM MEDICINES.

Worm medicines that are popular in the market are chiefly in the form of syrups or cordials, and confections or lozenges. Worm powders and pills are, however, frequently used, and "Worm Tea" is not an unpopular form of medication.

The following formulæ are representative of various forms of Worm medicines which have a popular sale.

4148.

Worm Killer.

Santonin in fine powder,	$\frac{1}{4}$ ounce av.
Fluid Extract of Pink Root,	$\frac{1}{2}$ fl.ounce.
Fluid Extract of Senna,	1 fl.ounce.
Essence of Peppermint,	20 minims.
Simple Syrup, sufficient to make a pint.	

Mix them well together.

It is not intended that the Santonin shall be dissolved in this preparation, but it must be "shaken before taken." Santonin should never be dissolved when used as a worm medicine, for the reason that in solution it acts as a poison to the patient instead of the worms, because it is much more rapidly absorbed than when given in powder, and, as the medicine is designed to act on the contents of the stomach or bowels instead of through the blood, it is obvious that it should not be in solution.

4149.

Tonic Vermifuge.

Male Fern Root, in coarse powder, . . .	4	ounces.
Anise Seed, } each, in coarse powder, . . .	1	ounce.
Pink Root, }		
Cape Aloes,	120	grains.
Carbonate Potassium (Sal Tartar), . . .	80	grains.
Culver's Root,	$\frac{1}{4}$	ounce.
Glycerin,	6	ounces.
Alcohol,	6	ounces.
Water,	6	ounces.

Grind the drugs to a coarse powder and moisten with 3 ounces each of the Alcohol and Glycerin, pack in a percolator and pour upon them the remaining liquids in which the Aloes and Carb. Potassium have previously been dissolved, allow to stand forty-eight hours and percolate, adding enough Water through the percolator to make 1 pint of the percolate.

Dose, teaspoonful to dessertspoonful.

4150. Standard Worm Syrup.

Pink Root,	16	ounces.
Male Fern Root,	8	ounces.
Senna Leaves,	8	ounces.
Worm Seed,	16	ounces.
Essence Anise,	2	ounces
Carbonate of Potassium, } each,	$\frac{1}{4}$	ounce.
Santonin,		
Sugar,	7	ounces
Water, a sufficient quantity to make a gallon.		

Grind the drugs to a coarse powder and steep them for six hours in nearly boiling water enough to cover them well, then pour off the liquid and reserve; put fresh water on the drugs and steep two hours, pour off this liquid and mix with that before reserved, pressing out all that is possible from the drugs.

Then evaporate the liquid to 5 pints, and while evaporating add the Carb. Potassium and Santonin; add, while cooling, the Essence Anise and Sugar, dissolve by agitation and strain.

Dose, teaspoonful to dessertspoonful.

This is a good general Worm Syrup requiring no laxative after using it. It may be made from the Fluid Extracts instead of the drugs, if preferred.

4151. Worm Syrup.

Fluid Extract of Pink and Senna,	3	fl.ounces.
Oil of Anise,	10	drops.
Syrup, sufficient to make a pint.		

Mix.

This is a simple "Pink or Senna" worm syrup, harmless and efficient; many other medicines may be combined with this, but we do not know that it can be much improved except by adding Santonine as in No. 4148.

4152. Vermifuge.

This vile compound—the terror of childhood—has, thanks to the advance of pharmacy, nearly gone out of use.

The following formulas will be sufficient.

Oil of Wormseed,	1	fl.ounce.
Oil of Peppermint,	1	fl.drachm.
Oil of Turpentine,	1	fl.drachm.
Castor Oil,	6	fl.ounces.

Mix well together.

4153.

Vermifuge.

Oil of Wormseed,	1	fl.ounce.
Fluid Extract Pink and Senna,	1	fl.ounce.
Glycerine,	5	fl.ounces
Essence of Peppermint,	$\frac{1}{2}$	fl.ounce.

Mix well together, shake before taking. The usual dose of vermifuge is from one-half to a teaspoonful.

4154.

Worm Lozenges.

This is by far the most popular form of administering worm medicines, for children will readily take them. The making of worm lozenges is mostly done by manufacturing houses who have apparatus suitable for such work. Santonin is the chief medicinal ingredient ; it is sometimes combined with calomel or other laxative remedies. The following formulæ make good worm lozenges, comfits or tablets. They can be made in the same way as other lozenges :

Santonin in fine powder,	50	grains.
Powdered Tragacanth,	150	grains.
Chocolate,	300	grains.
Powdered Sugar,	700	grains.

Rub the Chocolate with a little Water to a stiff paste. Mix the Santonin, Tragacanth and Sugar intimately, and with the addition of Water incorporate them with the Chocolate paste and cut into 100 lozenges.

4155.

Worm Lozenges or Tablets.

Santonin, in fine powder,	50	grains.
Calomel,	5	grains.
Carmine,	10	grains.
Powdered Tragacanth,	150	grains.
Powdered Sugar,	1,000	grains.

Mix the Carmine intimately with a portion of the Sugar, add the Santonin and Calomel, then the Tragacanth, and having mixed them thoroughly together make into a mass with Water and cut into 100 lozenges.

Other combinations may be made in the same manner.

As each lozenge contains $\frac{1}{2}$ grain of Santonin, the usual dose for children would be one or two before meals.

4156. Worm Tea-Powder.

This was formerly a very popular form of medicine for worms, but has now been superseded by more convenient preparations.

Wormseed, in powder,	2 ounces.
Pink Root, in powder,	6 ounces.
Senna, in powder,	6 ounces.
Liquorice Root, in powder,	2 ounces.

Mix them thoroughly. The dose is a teaspoonful to a dessert-spoonful in half a cup of hot water, sweetened, before meals.

4157. Vermifuge Tea.

Pink Root, in coarse powder,	4 ounces.
Pomegranate Bark, cut,	4 ounces.
Senna Leaves, cut,	4 ounces.
Wormseed,	2 ounces.
Anise Seed, ground,	2 ounces.

Mix thoroughly and put up in packages, of about two ounces.

Directions for preparing : Steep the contents of the package in a pint and a half of Water with gentle heat for two hours, then strain off one pint, add to it half a pound of sugar and $\frac{1}{4}$ pint alcohol.

Directions for taking : For children two to three years old a teaspoonful before meals, three times a day ; three to five years old, two teaspoonfuls ; five to ten years old, a tablespoonful ; ten years and older, a wine-glassful (two tablespoonfuls) before meals.

4158. Tape Worm Remedy.

Pomegranate Bark, ground,	3 ounces av.
Male Fern, ground,	1 ounce av.
Senna Leaves, ground,	1 ounce av.
Kameela,	2 drachms.

Mix them well together.

One-half of this quantity is to be steeped in a pint of water and the infusion to be taken in doses of four ounces twenty minutes apart. If not successful in getting the head of the tape worm, the remainder can be prepared and taken in the same manner a week later.

Fluid Extracts of the ingredients as above may be mixed in the same proportion and given in the same manner, but are not considered so efficient as the infusion.

UNCLASSIFIED PROPRIETARY REMEDIES.

The following preparations were not included in the classes which have been already given. Many more might be included, but the line is already quite extended and is probably sufficient for the uses of the trade.

4159. **Phosphorized Cod Liver Oil.***Phosphorol.*

Phosphorus,	1 grain.
Cod Liver Oil,	24 fl.ounces.

Shave the Phosphorus fine and having mixed it with 4 fl.ounces of the Oil, stop tightly in a bottle and heat by water-bath until the Phosphorus is melted, shake well until the Phosphorus is all dissolved, then add the remainder of the Oil and mix them well together.

A dessertspoonful, the usual dose, contains $\frac{1}{100}$ grain Phosphorus.

4160. **Iodized Cod Liver Oil.**

Iodine,	16 grains.
Cod Liver Oil,	16 fl.ounces.

Add the Iodine to the Cod Liver Oil contained in a closely stopped bottle, and heat by means of a water-bath until the Iodine is dissolved.

A dessertspoonful, the usual dose, contains $\frac{1}{4}$ grain Iodine.

4161. **Iodo-ferrated Cod Liver Oil.**

Tasteless Iodide of Iron,	64 grains.
Cod Liver Oil,	16 fl.ounces.

Rub the Tasteless Iodide of Iron to a fine powder and then with the Cod Liver Oil gradually added, until the salt is dissolved as much as it will, then allow to settle and decant the clear portion.

The dose is a dessertspoonful.

4162. **Hamburger Drops.**

Socotrine Aloes, in powder,	2 ounces.
Myrrh, in powder,	$\frac{1}{2}$ ounce.
Cinnamon Bark, in powder,	$\frac{1}{2}$ ounce.
Cloves, in powder,	1 drachm.

Opium, in powder,	1	drachm.
Saffron, American,	2	drachms.
Alcohol, sufficient to make	1	pint.

Mix the drugs and macerate first with 12 fl.ounces of Alcohol for one week with frequent agitation and pour off the clear liquid and reserve, then pour on the drugs, 6 fl.ounces more of Alcohol, macerate as before and add the product to the reserved liquid.

The dose is 10 to 30 drops or more.

4163. **Holloway's Pills.**

As these are much called for, the formula is given.

Aloes,	200	parts.
Rhubarb,	40	parts.
Black Pepper,	18	parts.
Saffron,	10	parts.
Sulphate of Sodium, dried,	10	parts.

To be divided into $3\frac{1}{2}$ grain pills.

4164. **Hunn's Life Drops.**

Oil of Cajuput,	1	fl.ounce.
Oil of Anise,	1	fl.ounce.
Oil of Cloves,	1	fl.ounce.
Oil of Peppermint,	1	fl.ounce.
Alcohol,	4	fl.ounces.

Dissolve the Oils in the Alcohol. This is used as a quick stimulant for colic, pain, etc. The dose is 10 to 20 drops on sugar.

4165. **Liquid Rennet.**

The inner lining membrane of one calf's stomach, dissected off and chopped.

Hydrochloric Acid,	6	fl drachms.
Glycerin,	6	fl.ounces.
Water, sufficient to make	1	pint.

Macerate for two weeks and strain or filter.

This is used for dyspepsia and also in cooking to make curd, with milk.

Pepsin prepared from calf's stomach may be used instead of the fresh stomachs, but pepsin prepared from pig's, or other, stomachs will not make a curd with milk.

The dose is a teaspoonful to a dessertspoonful.

4166.**Listerine.**

This is a proprietary medicine used as an antiseptic solution, and claimed to contain the essential antiseptic properties of thyme, eucalyptus, baptisia and mentha arvensis, combined with benzoic and boric acids.

The following formula will make a good preparation of this kind, but is not claimed to be the exact formulæ of the original.

Boric Acid,	128 grains.
Benzoic Acid,	64 grains.
Baptisin,	20 grains.
Thymol,	20 grains.
Eucalyptol,	10 grains.
Menthol,	10 grains.
Oil of Wintergreen,	5 minims.
Glycerin,	1 fl.ounce.
Alcohol,	2 fl.ounces.
Water, sufficient to make	1 pint.

Mix the Boric Acid with the Glycerin and Water, add the other ingredients to the Alcohol, and after standing 24 hours, add the aqueous solution to the alcoholic, and after standing filter.

4167.**Papine.**

This is a proprietary preparation of Opium claiming to represent 1 grain of Opium in a fl.drachm. Such a preparation may be made as follows :

Deodorized Tincture of Opium (1870),	3½ fl.ounces.
Elixir,	13 fl.ounces.

Mix them. Dose a tablespoonful.

4168.**Soda Mint.**

Bicarbonate of Sodium,	1 ounce av.
Peppermint Water,	1 pint.
Aromatic Spirit of Ammonia,	1 fl.drachm.

Mix, dissolve and filter.

This may be sweetened with 2 ounces of Sugar if desired, but for medicinal effect is usually preferred plain.

This is given in doses of a teaspoonful to a tablespoonful, for acid stomach, dyspepsia, etc.

4169.

Chlorides Solution.

A solution of Chlorides for disinfecting, bleaching, deodorizing, etc., may be prepared and put up as proprietary.

Formulas have been already given for such preparations under other headings. The following is, however, given :

Chloride of Ammonium,	½ ounce.
Chloride of Calcium,	½ ounce.
Chlorinated Lime,	2 ounces.
Carbonate of Sodium,	2½ ounces.
Water, sufficient to make	2 pints.

Dissolve the Chlorides and Chlorinated Lime in 1 pint of Water and the Carbonate of Sodium in a pint of boiling Water, and pour upon the solution of Chlorides, etc. in a close vessel, stir the contents, cover tightly, allow to settle and decant the clear liquid.

4170.

Colorless Solution Hydrastine.

Hydrastine, White Alkaloid,	20 grains.
Glycerin,	2 ounces.
Diluted Hydrochloric Acid, q. s. to dissolve,	
Water, sufficient to make	1 pint.

Rub the Hydrastine with a portion of the Water and add the Acid drop by drop until it is dissolved, then add the Glycerin and the remainder of the Water.

4171.

Stoke's Liniment.

Oil of Turpentine,	3 fl.ounces.
Oil of Lemon,	60 minims.
Acetic Acid,	½ fl.ounce.
Yolk of Egg,	No. 1.
Rose Water,	3 fl.ounces.

Shake the Oils with the Yolk of Egg and Acid in a bottle until they are well mixed.

4172. Concentrated Tincture Avena Sativa or Oats.

Common Black Oats,	16⅔ ounces av.
Alcohol, a sufficient quantity to make	1 pint.

Make a fluid extract or concentrated tincture in the same manner as is directed (1069).

4173. Tongaline or Tonga.

This is a proprietary remedy for neuralgia, etc., and is prepared from Tonga, a mixture of barks obtained from Fiji Islands. It may be made from

Fluid Extract Tonga, 4 fl.ounces.

Diluted Alcohol, 1 pint.

or by percolating 4 ounces of Tonga with Diluted Alcohol until 20 fl.ounces are obtained.

4174. Viburnum Compound.

Black Haw Bark, 12 ounces av.

High Cranberry Bark, 8 ounces av.

Blue Cohosh, 3 ounces av.

Life Root Plant, 3 ounces av.

Sugar, 4 ounces av.

Alcohol, 3 pints.

Water, sufficient to make 1 gallon.

Make a tincture of the drugs by percolating first with the Alcohol mixed with an equal quantity of Water, and then with Water until one gallon is obtained. In this dissolve the Sugar and filter.

The dose is a dessertspoonful.

PART V.

TOILET PREPARATIONS AND PERFUMES.

The formulæ for preparations which are used for the Toilet and Perfumes would of themselves fill a large volume. In this work, therefore, a few only of those most important and most likely to be used by druggists and pharmacists can be given, and our readers are referred to the more elaborate works on this subject for further information if desired.

BANDOLINE.

Bandoline is intended to be used as a fixer for the hair and for other similar uses. Several different kinds may be made, as shown in the following formulas.

4175. Rose Bandoline.—Best Flake Tragacanth 1 ounce av., Rose Water 13 fl.ounces, Cologne Spirit 3 fl.ounces. Mix the Rose Water and Cologne Spirit and macerate the Tragacanth in the mixture for several days, stirring frequently, then squeeze through a coarse muslin strainer, let stand two or three days and again squeeze through muslin.

This makes a white translucent preparation; if desired it may be colored pink or red with solution of carmine.

4176. Quince Bandoline.—Quince seed coarsely powdered or bruised $\frac{1}{2}$ ounce, Orange Flower Water 13 fl.ounces, Cologne Spirit 3 fl.ounces. Make in the same manner as the preceding. In either of these formulas, Distilled Water may be used instead of Rose or Orange Flower Water and 1 ounce of any kind of bulk perfume added in place of 1 ounce of the Cologne Spirit directed. By using hot Water the operation may be greatly hastened.

4177. Bandoline Powder.—The best Bandoline Powder is prepared from Quince Seeds, although it is not so light colored, and does not yield so much liquid as that prepared from Tragacanth.

The following formulas may be used: Quince seed, in fine powder, 4 ounces, Bulk Perfume (Upper Ten or other) 2 fl.drachms. Mix them well together.

This is put up in packages of about 1 drachm, which will make 3 or 4 ounces of Bandoline when added to Water.

Tragacanth, in fine powder, 4 ounces, Acacia, in fine powder, 1 ounce, Bulk Perfumes 2 fl.drachms. Mix and use as the foregoing.

Powdered perfumed soap also makes a good Bandoline Powder, a few grains only should be mixed with a few drops of Water when wanted for use.

COSMETICS FOR THE COMPLEXION.

In a general sense the term Cosmetic may be applied to preparations which are used to soften, cleanse, purify or beautify the complexion, hair, teeth, etc., but in this connection, the preparations only which are applied to "beautifying" the complexion will be noted. The preparations containing insoluble substances are best made by grinding them through a paint mill, but very good preparations may be made by rubbing them fine in a mortar as directed in the formulæ.

Liquid Cosmetics.

These are mostly preparations containing some insoluble ingredients which are intended to beautify the complexion, making the skin white or of a flesh tint, and covering tan, freckles, etc.

4178. Oriental Cream.—Calomel 2 ounces av., Sub-Nitrate of Bismuth 1 ounce av., Carbonate of Barium, or Oxide of Zinc, 1 ounce av., Water a sufficient quantity. Rub the powders in a mortar with successive portions of Water, allowing the precipitate to settle, and pouring off the Water several times to wash out the impurities and make a smooth preparation; finally, pour the precipitate into a pint bottle and add enough distilled or filtered rain water to make a pint. This preparation is similar and equal to the celebrated "Oriental Cream." It is only necessary that good material should be used in making it. It may also be made with four ounces of Calomel in 1 pint of water, in the same manner.

4179. Liquid Enamel or Pearl.—Oxide of Zinc, French, 2 ounces av., Prepared Chalk 2 ounces av., Calomel 1 ounce av., Essence Rose or Almonds 1 fl.ounce, Glycerin 1 fl.ounce, Water, a sufficient quantity. Rub the powders with successive portions of Water to wash out any impurities and reduce them to a smooth and uniform precipitate, and finally pour the precipitate in a pint bottle, add the Essence of Rose or Almond and enough distilled or filtered rain Water to make a pint.

4180. Cream of Roses.—Carbonate of Barium 2 ounces av., Prepared Chalk 2 ounces av., Carmine, No. 40, 10 grains, Carbonate of Potassium 5 grains, Glycerin 1 fl.ounce, Rose Water, sufficient to make a pint. Rub the

Carmine and Carbonate of Potassium together and add Rose Water gradually until it is dissolved. Mix the Carbonate of Barium and Chalk, and having washed them by rubbing with successive portions of Water, put the precipitate in a pint bottle, add the Glycerin, the dissolved Carmine and enough Rose Water to make a pint.

4181. Cream of Lilies, or Bloom of Youth.—Heavy Magnesia (*Magnesia Ponderosa*) 1½ ounces av., Oxide of Zinc 2 ounces av., Glycerin 1 fl.ounce, Water, sufficient to make a pint. Rub the Magnesia and the Zinc with successive portions of water to wash them, transfer the precipitate to a pint bottle, and add the Glycerin and enough Water to make a pint. A little perfume may be added if desired.

4182. Liquid Rouge, or Bloom of Roses.—This is used for giving a flesh tint or red coloring to the complexion, also for adding to any of the foregoing white preparations to impart a flesh tint. It is frequently put up in small bottles and furnished in a package with the white Cosmetique. It is made as follows: Carmine, No. 40, 120 grains, Carbonate of Potassium (Salts of Tartar) 60 grains, Glycerin 4 fl.ounces, Aqua Ammonia ½ fl.ounce, Orange Flower Water 12 fl.ounces. Rub the Carmine and the Carbonate of Potassium to a fine powder, add the Glycerin, rub them together, then add the Ammonia and Orange Flower Water. A small quantity of this liquid is applied to the cheek with a sponge or soft cloth and thoroughly rubbed in. For making a flesh tint of the white preparations, add from 1 to 1½ fl.drachms to a pint.

Vinegar Rouge. True Vinegar Rouge is prepared from pure Rouge, Carthamine (from safflower) by dissolving it in Alcohol and acidulating with Acetic Acid. An imitation may be made by adding Acetic Acid to a solution of Scarlet Aniline.

Creams, etc.

For Softening the Skin, Etc.

These are designed for softening the skin and removing tan, sunburn, freckles, chap, etc. Several different kinds of preparations are put up for such uses, and the following formulas are representative of preparations found in the market :

4183. Camphor Cream.—Quince Seed, in coarse powder, 60 grains, Hot Water 14 fl.ounces, Borax, powdered, 60 grains, Glycerin 2 fl.ounces, Spirit of Camphor 1 fl.ounce, Oil of Bitter Almonds 10 minims. Macerate the Quince Seeds for half a day with the Water and strain. Mix with the Glycerin. Dissolve the Oil of Bitter Almonds in the Spirit of Camphor and gradually add to it the Mucilage of Quince, etc., and mix them thoroughly.

4184. Fragrant Cream.—Quince Seed 120 grains, Borax, in powder, 60 grains, Hot Water 12 fl.ounces, Glycerin 3 fl.ounces, Cologne 2 fl.ounces. Crush the Quince Seed and macerate with the Hot Water for one hour, stir-

ring frequently, then strain through muslin, without pressure, add the Glycerin and Borax, and then add the translucent solution to the Cologne slowly, shaking them well together. One ounce of Bulk Perfume and 1 ounce of Cologne Spirit may be used instead of the Cologne. This is used for softening the skin, chap, etc. By using double the quantity of Quince Seed a preparation similar to "*Frostilla*" may be made.

4185. Marshmallow Cream.—Tragacanth, in powder $\frac{1}{2}$ ounce av., Marshmallow Root, cut, $\frac{1}{2}$ ounce av., Water 12 fl.ounces, Glycerin 3 fl.ounces, Cologne 2 fl.ounces. Mix the Glycerin with the Water, add the Tragacanth and Mallow to the mixture and agitate frequently for several days, then strain through a muslin strainer, add the Cologne, let stand two or three days and strain again.

4186. Savonia Cream.—White Castile Soap 1 ounce, Tragacanth $\frac{1}{4}$ ounce, Water 8 fl.ounces, Glycerin 6 fl.ounces, Cologne 2 fl.ounces. Make in the same manner as the preceding.

4187. Blandine.—Take of Albumen (white of egg) 6 ounces, Glycerin 10 ounces, Oil Bitter Almonds 10 drops. Mix the Albumen with the Glycerin, and add the flavor; pass several times through a muslin strainer to mix well and remove any "lumps." This is a fine liquid preparation for the skin. As the Glycerin is absorbed, a thin coating of Albumen is left on the surface, which protects it from the air.

4188. Amandine.—This is a preparation intended to whiten and soften the skin and prevent chapping, etc. Honey, strained, 2 ounces, White Soft Soap (2908) 1 ounce, Liquor Potassa, 1 fl.drachm, Oil of Sweet Almonds 28 ounces, Oil of Bergamot $1\frac{1}{2}$ drachm, Oil of Bitter Almonds $1\frac{1}{2}$ drachm, Oil of Cloves 40 minims, Balsam Peru 40 minims. Rub the honey with the Soft Soap in a mortar add the Liquor Potassa, and when thoroughly mixed gradually add the Almond Oil, with which the other oils have been previously mixed, stirring them thoroughly to form an emulsion.

4189. Shaving Cream.—White Wax, Spermaceti, Almond Oil, each $\frac{1}{2}$ ounce, Shaving Soap, William's 2 small cakes, Rose Water 2 ounces. Melt the Soap with the Rose Water in a wide mouth bottle. Melt the Wax Spermaceti and Almond Oil together and add to the warm solution of Soap, beating them all well together into a cream until cool.

Another formula is, William's Soap 8 ounces, Almond Oil, Cologne and Glycerine each 1 ounce, Water 8 ounces, made in the same manner.

4190. Shaving Cream for Metal Tubes.—Lard 16 ounces, Spermaceti 1 ounce, Caustic Potassa 2 ounces, Alcohol $\frac{1}{2}$ ounce, Oil Bitter Almond 20 minims, Water 16 ounces. Melt the Lard and Spermaceti together on a sand-bath. Dissolve the Caustic Potassa in half the Water and gradually add the solution to the melted Lard, etc., with gentle stirring. Dissolve the Oil of Almond in the Alcohol, mix with the Water and while the Soap is cooling mix it thoroughly. This may be run into metal tubes while warm.

Face and Toilet Powders, etc.

A great variety of Toilet and Face powders are found on the market, some in the form of powder and some in the form of balls or solid blocks or tablets. The following formulas represent the most desirable kinds.

4191. Face Powder—(white).—Oxide of Zinc, English, Hubbuck's 6 ounces, Precipitated Chalk, English 6 ounces, Rice Flour, Bolted 16 ounces, French Chalk, very fine powder, 4 ounces, Orris Root, in very fine powder, 4 ounces, Oil of Santal 60 minims, Oil of Cloves 20 minims. The Orris Root must be reduced to an impalpable powder, and thoroughly mixed with the other powders, the Oils are then to be rubbed with a portion of the powder, and the remaining powder gradually added and thoroughly mixed. The chief trouble usually experienced with Face Powders is to reduce them to the proper fineness. This is especially the case when Orris Root is used, as it is a very refractory substance to reduce to an impalpable powder. To obviate this difficulty, the Extract of Orris (934), such as is used in perfumery; may be used in place of the powdered root. It may be gradually mixed by rubbing it with the powder, and the Alcohol evaporated off by exposing for a few hours in the open air to gentle heat. This should be done before adding the Essential Oils.

Flesh. The Flesh-tinted Powders may be prepared from this or any other white powders, by first rubbing a little Carmine to an impalpable powder, mixing it with a portion of the powder, and then gradually incorporating more of the powder until the desired shade is obtained. It requires considerable care to incorporate the Carmine so that it will not be "streaked," and it may therefore be advisable to add it in the form of a solution, first, with a portion of the powder, and then with enough gradually added to make the desired color.

4192. Swan-Down Face Powder.—Oxide of Zinc, Hubbuck's, 4 ounces, Orris Root, *in very fine powder*, 1½ ounce, French Chalk 4½ ounces. Mix them thoroughly, perfume if desired.

4193. Peerless Face Powder.—French Chalk 2½ ounces, Corn Starch 3 ounces, Oxide of Bismuth ½ ounce, Precipitated Chalk 4 ounces. Mix them.

4194. Bloom of Ninon Face Powder.—Precipitated Chalk 4 ounces, Sub-Carbonate of Bismuth 1 ounce, Oxide of Zinc, Hubbuck's, 2½ ounces, Corn Starch 4 ounces. Mix them thoroughly and perfume with Essence of Orris and Rose. This is known also as Saunder's Face Powder.

4195. Invisible Face Powder.—French Chalk 4 ounces, Calcined Magnesia 1 ounce, Precipitated Chalk 2 ounces, Subcarbonate of Bismuth 1 ounce, Carmine 30 grains. Mix them.

4196. Complexion Powder.—French Chalk 4½ ounces, Precipitated Chalk 3 ounces, Oxychloride of Bismuth 1 ounce. Mix them.

4197. Lily White Tablet.—The Lily White tablets and solid cakes and balls that are found in the market consist mainly of Prepared or Precipitated Chalk 4 parts, French Chalk 5 parts, ground together in a mill with water sufficient to make a thick paste, and run into the desired form or cut, or formed while still moist into the required shape.

4198. Rose or Violet Toilet Powder.—The ordinary Toilet or Baby Powder which is used as a drier or dusting after washing, and by barbers after shaving, may be made with Wheat Starch or Arrow Root, in fine powder, 1 pound, Oxide of Zinc or Oxide of Bismuth 4 ounces, Orris Root, in very fine powder, 2½ ounces. This may be perfumed with Essence of Rose for *Rose Powder*, or with Essence of Orris for *Violet Powder*.

DENTIFRICES.

Dentifrices or cosmetics for the teeth are found in the market in the forms of Tooth Powders, Tablets, Pastes, Washes and liquid saponaceous compounds. They are mostly to be used on a brush, and are put up in various ways to make them attractive and convenient for use. The following formulæ represents the different kinds of preparations which are in use :

Tooth Washes and Cosmetics.

4199. Balm of a Thousand Flowers.—This is a liquid dentifrice, also used for softening the skin, shaving, etc. It may be made as follows : White Castile Soap 2 ounces, Honey 4 ounces, Water 12 ounces, Alcohol 4 ounces, Oil of Rose 3 drops, Oil of Wintergreen 10 drops, Oil of Cinnamon 5 drops, Extract of Vanilla ½ ounce. Dissolve the soap in the water by the aid of heat, add the Honey; dissolve the Oils in the Alcohol and mix with the solution of Soap, etc. After standing, filter.

4200. Oriental Tooth Wash.—Soap Bark (Quillaya) 4 ounces, Orris Root 2 ounces, Tannin 30 grains, Cloves 60 grains, Oil Wintergreen 2 drachms, Cologne Spirit enough to make 20 ounces. Grind the drugs to a coarse powder and macerate for seven days in 1 pint of Cologne Spirit; pour off the liquid and put the drugs in a percolator; pour the liquid upon the drugs and percolate, adding Cologne Spirit in the percolator until 20 ounces of percolate are obtained. Dissolve the Oil of Wintergreen in the percolate, and filter, if necessary.

4201. Saponaceous Tooth Wash.—White Castile Soap 1 ounce, Oil Cloves, Oil Cinnamon each 10 minims, Oil Wintergreen 15 minims, Oil Peppermint 20 minims, Hot Water 4 ounces, Alcohol or Cologne Spirit 10 ounces, Glycerin 2 ounces. Cut the Soap in thin shavings, and dissolve in the Hot Water; dissolve the Oils in the Alcohol, add the Solution of Soap and Glycerin, and color with Cochineal or Caramel, or both; filter, add a little Powdered Charcoal in the filter.

4202. Eau Angelique.—Angelica Root, true, $\frac{1}{2}$ ounce, Red Rose Leaves 2 drachms, Cloves 90 grains, Nutmeg, Cinnamon, each, 60 grains, Extract Vanilla $\frac{1}{2}$ ounce, Oil Peppermint 30 minims, Oil Wintergreen 20 minims, Cologne Spirit 14 ounces, Glycerin 2 ounces, Cochineal 8 grains. Grind the drugs to a fine powder and macerate for seven days with the mixed Glycerin and Cologne Spirit; pour off the liquid and put the drugs in a percolator; pour the liquid upon the drugs and percolate, adding enough Cologne Spirit through the percolator to make 1 pint. Dissolve the Oils in 2 drachms of Cologne Spirit and mix with the liquid; then add the Extract Vanilla and filter, adding a little Powdered Charcoal in the filter.

4203. Balsamic Tooth Wash.—Compound Tincture of Benzoin, Tincture Tolu, Tincture Myrrh, each $\frac{1}{2}$ ounce, White Castile Soap 1 ounce, Hot Water 10 ounces, Glycerin 2 ounces, Cologne Spirit 3 ounces, Oil Peppermint 40 minims, Oil Wintergreen 20 minims, Oil Cloves 10 minims. Mix the Tinctures and the Cologne Spirit, and dissolve the Oils in the mixture. Cut the Soap in fine shavings, and dissolve in the Hot Water; add the Glycerin to this solution. Add the saponaceous solution very gradually to the solution of Oils and Balsams, allow to stand twenty-four hours, shaking occasionally, then filter, adding a little Powdered Charcoal to the filter.

The saponaceous solution can be best added to the balsamic solution by putting a cork in a funnel so that it will be added drop by drop.

The solution of soap must always be added to the balsamic solution.

4204. Almond Tooth Cream.—Tincture Myrrh, Tincture Tolu, each $\frac{1}{2}$ ounce, Oil Bitter Almonds 20 minims, Borax, powdered, $\frac{1}{2}$ ounce, Glycerin 2 ounces, Hot Water 13 ounces. Mix the Tinctures, and dissolve in the mixture the Oil of Bitter Almonds, dissolve the Borax in the Hot Water and add the Glycerin, add the solution of Borax very gradually (by dropping as directed in the previous formulæ) to the Tinctures, etc.

4205. Carbolated Tooth Wash.—Carbolic Acid 20 grains, Alcohol 1 drachm, Eau Angelique 1 pint, dissolve the Carbolic Acid in the Alcohol and add the Eau Angelique. Carbolic Acid may be added to any of the other Tooth Washes, in the same proportion as above. It makes a valuable addition in many cases, as it destroys the odor of decayed teeth and offensive breath.

4206. Arnica Tooth Wash.—Arnica Flowers 1 ounce, Gum Myrrh $\frac{1}{4}$ ounce, Cloves 60 grains, Cinnamon 60 grains, Oil Peppermint 40 minims, Cologne Spirit enough to make 1 pint, grind the drugs to a fine powder and percolate with the Cologne Spirit until 1 pint is obtained, and add the Oil of Peppermint, filter if necessary.

4207. "Sozodont."—This is a proprietary Dentifrice, a similar preparation may be made with White Castile Soap 1 $\frac{1}{2}$ ounce av., Glycerin 4 fl.ounces, Cologne Spirit 6 fl.ounces, Water 6 fl.ounces, Oil Peppermint 20 minims, Oil Wintergreen 30 minims, Oil Cloves, 10 minims, Extract Vanilla $\frac{1}{2}$ ounce, cut the Soap in fine shavings and dissolve it in the water by the aid of heat,

then add the Glycerin and Extract Vanilla, dissolve the Oils in the Alcohol and add, and after standing filter.

Tooth Pastes.

Tooth pastes are favorite dentifrices, made up in the form of a soft mass and usually put up in flat earthen jars.

4208. Cherry Tooth Paste.—Precipitated Chalk 8 ounces, Powdered Orris Root 8 ounces, Powdered Areca Nut 2 ounces, Powdered Cuttle Bone 2 ounces, Powdered Quillaya Bark 1 ounce, Borax, in powder, 1 ounce, Carmine, in fine powder, or solution of Carmine, a sufficient quantity Oil of Cloves, Oil of Nutmeg, each 40 minims, Oil of Bitter Almond 30 minims, Oil of Rose 10 minims, Glycerin, Honey and Mucilage Acacia, equal quantities, each a sufficient quantity to make into a mass, mix the powders first and color with the Carmine or Carmine solution, then make into a mass.

4209. Saponaceous Tooth Paste.—Precipitated Chalk 4 ounces, Powdered Orris Root 4 ounces, White Castile Soap 1 ounce, Powdered Borax 1 ounce, Powdered Myrrh $\frac{1}{2}$ ounce, Honey and Glycerin, equal parts, sufficient to make a paste. This may be perfumed with Wintergreen, Cassia or other flavors, and colored with Carmine or Rose Pink, if desired.

4210. Odontine Paste.—French Chalk 8 ounces, Soap, in powder, 4 ounces, Sugar 4 ounces, Gum Arabic, in powder, $\frac{1}{2}$ ounce, Peppermint Oil, Wintergreen Oil, each 1 drachm, Glycerin and Honey, sufficient to make a mass. This may be colored if desired.

4211. Charcoal Tooth Paste.—A Charcoal Tooth Paste may be made by using 4 ounces of Charcoal, in fine powder, instead of the Soap, in the foregoing formula.

4212. Tooth Paste for Metal Tubes.—A Tooth Paste for putting up in metal tubes may be made from any of the foregoing formulas by making them much thinner with the Glycerin and Honey than when they are to be put up in jars or pots.

Tooth Powders.

Tooth Powders are the most frequently sold of any of the dentifrices, probably because they are better known and are furnished at a less price; a great variety are found in the market. The following formulæ make preparations similar to a few of the best.

4213. Tooth Powder.—*General formula.*—Precipitated Chalk 8 ounces, Powdered Cuttle Bone 4 ounces, Orris Root, in powder, 3 ounces, Powdered Borax 1 ounce, Oil of Cloves 10 minims, Oil of Wintergreen 2 fl.drachms. Carmine solution a sufficient quantity, mix the powders and with a small portion incorporate the Oils and sufficient of the Carmine solution to color the

batch, making a moist powder, to this gradually add the remainder of the powder, rubbing the mixture well together until they are thoroughly mixed and of uniform color and flavor. This may be flavored with other flavoring oils in place of those mentioned, as desired, giving it an entirely different flavor. Various substances may be added to this powder, changing it in appearance, flavor, etc., but it is essentially the basis of all the other powders and may be kept in stock for mixing other substances, as Powdered Pumice Stone or Marble Dust may be used instead of Powdered Cuttle Bone, but the latter is generally preferable.

4214. Carbolic Tooth Powder.—Mix $\frac{1}{2}$ ounce of Carbolic Acid with 20 ounces of the foregoing, by rubbing it first with a small portion of the powder and then incorporating with the remainder.

4215. Cinchona Tooth Powder.—Add 2 ounces of powdered Cinchona Bark and 1 ounce of powdered Myrrh to 20 ounces of the general Tooth Powder (4213).

4216. Camphorated Tooth Powder.—Mix Camphor in fine powder 1 ounce with 20 ounces of the general Tooth Powder (4213), and when thoroughly mixed pass through a fine sieve.

4217. Quinine Tooth Powder.—Mix Sulphate of Quinine $\frac{1}{4}$ ounce with 20 ounces of the general Tooth Powder (4213).

4218. Rose Tooth Powder.—Precipitated Chalk 8 ounces, Powdered Orris Root 4 ounces, Powdered Cuttle Bone 4 ounces, Carmine in fine powder 2 drachms, or sufficient to color, Oil of Rose 30 minims, Oil of Santal Wood 5 minims, Oil Cassia 5 minims, mix them well together as directed in the general formula.

4219. Saponaceous Tooth Powder.—Precipitated Chalk 8 ounces, Powdered Cuttle Bone 4 ounces, Powdered White Soap 4 ounces, Oil of Wintergreen 2 drachms, Oil of Calamus 10 minims, mix them well together.

It is needless to give further formulas for tooth powders, as an infinite variety may be made in the same general manner as has been described in the foregoing, it being only necessary to change the flavor, or color, and add such other antiseptic or other ingredients as may be desired.

4220. Tooth Tablets.—These are simply tooth powders put up in the form of cakes or squares, and may be made as follows: Powdered Cuttle Bone or Pumice Stone 4 ounces, Orris Root, in powder, 4 ounces, Carbonate of Magnesium 4 ounces, White Castile Soap 4 ounces, Gum Arabic, in fine powder, 1 ounce, Water 6 ounces, Essence of Wintergreen 2 ounces. Beat the Castile Soap and the Gum Arabic with the water and Essence of Wintergreen, and having mixed the other powders, gradually incorporate them with the mixture by working in a mortar the same as a pill or lozenge mass. Then roll out and cut out or mark as desired into squares, and dry them with gentle heat.

Mouth Waters.

In this connection it is proper to give a few formulas for Mouth Waters, which are used for rinsing the mouth and teeth, preventing bad breath, etc.

4221. Eau de Botot or Mouth Water.—Anise Seed 10 ounces, Ceylon Cinnamon $2\frac{1}{4}$ ounces, Cloves 75 grains, Cochineal $\frac{1}{2}$ ounce, Oil of Peppermint $\frac{1}{2}$ ounce, Alcohol sufficient to make 20 fl.ounces, grind the drugs and macerate with the alcohol, then percolate until 20 ounces have passed and dissolve the Oil of Peppermint in the percolate. This may be more readily made with Oil of Anise $\frac{1}{2}$ ounce, Oil of Cinnamon 1 drachm, Oil Peppermint $\frac{1}{2}$ ounce, Oil Cloves, 10 minims, dissolved in Alcohol 19 fl.ounces. A teaspoonful of this is poured into half a glass of Warm Water for rinsing the mouth and teeth. It may be applied to the teeth also with a brush, simply to clean them.

4222. Salicylic Mouth Water.—Salicylic Acid 20 grains, Oil of Peppermint 10 drops, Oil of Wintergreen 20 drops, Alcohol 2 fl.ounces, Orange Flower Water, Distilled Water, each, $2\frac{1}{2}$ fl.ounces, mix the Oils and Acid with the Alcohol and add the Waters. This is to be diluted with 2 to 4 parts of Water when used.

4223. Violet Mouth Water.—Extract of Orris Root (934) 8 ounces, Essence of Rose (920) 8 ounces, Oil Bitter Almonds 5 drops, Alcohol 8 ounces, mix them. Use 1 teaspoonful in half a glass of water for rinsing the mouth, etc.

HAIR PREPARATIONS.

Preparations for the Hair are put up by most all druggists, and a great variety of Dyes, Restoratives, Tonics, Pomades, Cosmetics, Oils, etc., are found in the market. The formulæ for Dyes, Restoratives and Tonics have already been given in the Standard Remedies Department, and the formulas which follow will be more especially devoted to such as are classed with Toilet Preparations.

Depilatories.

Depilatories are preparations designed to remove superfluous hair, by killing its roots. They are but little used.

4224. Depilatory Paste.—Freshly-slacked Lime 1 ounce, Starch in fine powder 2 drachms, Glycerin 2 ounces, Water $\frac{1}{2}$ ounce; heat the Starch with the Glycerin on a sand-bath until it is gelatinized; then mix the Lime with the Water and stir with the paste until thoroughly mixed. The hair is to be shaved off close, this is then to be applied and left on for only a few moments

(3 to 5 minutes), then removed and the part dressed with cream or soft ointment.

4225. Depilatory Powder.—Arsenic 1 part, Quick Lime 8 parts, well mixed together; when used this is to be mixed with Glycerite of Starch, or Soft Soap; it should be freshly made when wanted. As this is quite poisonous as well as caustic it should be handled with caution.

4226. Depilatory Liquid.—Quicklime, in powder, 1 ounce, Carbonate of Potassium 1 ounce, Sugar 2 ounces, Water 4 ounces, boil them together and after standing decant. The Caustic Liquid may be applied as it is or mixed with starch paste.

Hair Dyes.

Formulas for Hair Dyes will be found on pages 1079, 1080; but two more are appended here.

4227. Bismuth Hair Dye.—Trisnitrate of Bismuth 1 ounce av., Glycerine $3\frac{1}{2}$ fl.ounces, dissolve the Bismuth in the Glycerine. When desired to use mix the Dye with an equal quantity of Water and apply as usual.

4228. Vanadium Hair Dye.—This is applied with two preparations in the same manner as the Nitrate of Silver Dye 4039, using the same mordant, and then apply the Vanadium solution in the same manner as the Silver Dye. The Vanadium Solution is made with Vanadate of Ammonium 10 grains, dissolved in Water 4 ounces.

Hair Oils, Etc.

These are liquid preparations intended as a dressing for the hair to keep it soft and glossy, clean the scalp, etc. A great variety of such preparations may be made, but a few formulas only will be necessary; for, with a good base, the perfumes may be varied to suit the taste. The following bases may be used:

4229. Castor Oil Base for Hair Oil.—Castor Oil 12 fl.ounces, Alcohol 5 fl.ounces. Mix them. As Castor Oil mixes in all preparations with Alcohol this may be made thinner if desired by using a larger proportion of Alcohol.

4230. Other Hair Oil Bases.—*Oil of Benne, Oil of Almond, Mustard Seed Oil, Oil of Cotton Seed, refined, Lard Oil, Salad Oil, Hickory Nut Oil and White Neutral Paraffin Oil*, are all good bases for Hair Oils; they may be perfumed with any combination of perfuming Oils desired, and colored if desired as directed for coloring.

4231. Coloring for Hair Oils.—Hair Oils are best colored Red by infusing them with Alkanet contained in a thin cotton bag, occasionally squeezing out the coloring matter. No other substance gives so fine a red color to Oils as this. The Oils may be heated or macerated cold, but it requires longer if

prepared cold. Other colors for Hair Oils are seldom required, but they can be colored orange or yellow with Anatto, or green with fresh lawn grass.

4232. Walnut Hair Oil.—As a sample of Hair Oils that may be made by macerating substances of various kinds in oils the following is given: Crush 2 ounces of fresh green Walnut shells with $\frac{1}{4}$ ounce of powdered Alum to a smooth paste; digest with 10 ounces of White Neutral Paraffin Oil or any bland Vegetable Oil, as Cotton Seed or other oil, until all vapor has been driven off, then strain and perfume as desired. Fresh Violet Flowers, Rose or Orris or other odorous substances, may be macerated with Oil in a similar manner.

Perfumes for Hair Oils.

Hair Oils may be perfumed as desired with perfuming Oils or mixtures of Oils. The following mixtures for general use are recommended:

4233. Rose Oil Perfume, cheap.—Oil of Bergamot 4 ounces, Oil of Citronella 1 ounce, Oil of Cassia or Cinnamon 3 drachms, Oil of Cloves $\frac{1}{2}$ drachm. Mix them. Of this, from 3 to 6 drachms or more may be used for each pint of Oil. If finer perfumes are desired without regard to expense, from 1 to 3 ounces of Bulk Perfume of any odor may be used in place of an equal quantity of Alcohol in the Castor Oil Base, or the following combinations of Fatty Perfuming Oils, etc., may be used to mix with any of the other Hair Oil bases. The fatty Oils mentioned in the formulas are made by macerating the fresh flowers in Almond or Olive Oil. They are imported and may be obtained of New-York jobbing houses. These perfumes can also be used for fine pomades or stick cosmetics.

4234. Fine Rose Oil Perfume.—Oil or Otto of Rose 2 parts, Oil of Rose Geranium 4 parts, Oil of Patchouli 1 part, Oil of Jasmine, fatty, 10 parts, Oil of Tuberose, fatty, 10 parts, Oil of Violet, fatty, 5 parts. Mix them. This may be used as is necessary to perfume the Oil, from 2 drachms to 1 ounce being used to each pint of Oil.

4235. Fine Orange Flower Perfume.—Oil of Neroli, Bigarade, 1 part, Oil of Neroli, Petit Grain, Oil of Jasmine, fatty, 10 parts. Mix them. This may be used the same as the foregoing.

4236. Ilang Ilang Perfume.—Oil of Ilang Ilang 1 part, Oil of Tuberose, fatty, 10 parts, Oil of Violet, fatty, 5 parts. Mix them. This may be used the same as the foregoing. Other combinations may be made in the same manner.

Hair Growers.

For promoting the growth of the hair many preparations of an oily nature are used. Several such preparations are noticed under

Hair Tonics; the following are added in this department. These are particularly used for thin or falling hair, baldness, etc.

4237. Hair Grower.—Neutral Paraffin Oil or Cotton Seed Oil 1 pint, Cantharides, in coarse powder, 60 grains, Alkanet Root, in coarse powder, $\frac{1}{2}$ ounce, Oil of Cinnamon 5 minims, Oil of Lemon 30 minims, Oil of Citronella 10 minims, Oil of Bergamot 60 minims. Enclose the Cantharides and Alkanet in a coarse muslin bag and digest in the Oil by the aid of a water-bath at a moderate heat for 12 hours, occasionally squeezing the bag, and then, when cool, add the perfuming oils.

4238. Bay Hair Grower.—Castor Oil 10 ounces av., Tincture of Cantharides (1880) 1 fl.ounce, Cologne Spirit 5 fl.ounces, Oil of Bay Leaves 20 minims, Oil of Pimento 5 minims, Oil of Bergamot 30 minims. Mix them. This may be colored red if desired with Tincture of Alkanet.

4239. Cocaine or Cocoa Cream.—Cocoanut Oil 1 ounce, Castor Oil 8 ounces, Cologne Spirit 7 ounces, Oil of Bergamot 1 drachm, Oil of Lemon $\frac{1}{2}$ drachm. Melt the Cocoanut Oil by gentle heat and add it to the Castor Oil previously warmed, add the Cologne Spirit and, when cool, the flavoring Oils.

4240. Tricophorus.—Castor Oil 8 ounces, Alcohol 8 ounces, Oil Bergamot $1\frac{1}{2}$ drachms, Tincture Cantharides (1880) 2 drachms, Tincture Alkanet, sufficient to color a light red. Mix.

4241. Hair Grower Pomade.—Petrolatum 1 pound, Tincture of Cantharides $1\frac{1}{2}$ ounce, Oil of Cinnamon 10 minims, Oil of Bergamot 60 minims, Oil of Citronella 20 minims, Oil of Cloves 5 minims. Melt the Petrolatum, add the tincture, and while cooling add the oils.

Hair Lotions.

Hair Lotions differ from Hair Oils in containing but little or no oil. They are applied more freely to the hair and intended to promote its growth, and give it a gloss or luster, also to clean the scalp and remove dandruff, eruptions, etc.

4242. Almond Hair Lotion.—Cologne 4 ounces, Glycerin 1 ounce, Water of Ammonia $\frac{1}{2}$ ounce, Bitter Almond or Cherry Laurel Water 4 ounces. Mix them.

4243. Bay Hair Lotion.—Make the same as the foregoing, only use Bay Rum instead of Cologne.

4244. Rose Hair Lotion.—Make the same as the first mentioned, but use Rose Water instead of Almond Water. Many others may be made in the same manner.

4245. Stimulating Hair Lotion.—For thin hair, baldness, etc., Tincture of Cantharides (1880) 2 drachms, Acetic Ether 2 drachms, Glycerin 2 ounces, Bay Rum 6 ounces. Mix them. Cologne diluted with an equal quantity of Water may be used instead of Bay Rum.

4246. Bay Rum.—A great many formulas for Bay Rum have been published, but we have seen no reason to change the formula which we published many years ago, which quite closely imitates the imported distilled Bay Rum, and gives excellent satisfaction. It was as follows: Oil of Bay Leaves 2 fl.drachms, Oil of Bergamot 30 minims, Oil of Pimenta 15 minims, Acetic Ether 15 minims, Caustic Soda, or concentrated Lye, 2 drachms, Cologne Spirit $3\frac{1}{2}$ pints, Water $4\frac{1}{2}$ pints. Grass-green coloring, sufficient. Mix the oils and dissolve them in the Cologne Spirit, dissolve the Caustic Soda in the Water and gradually add the solution to the Alcoholic solution of the oils, then add the Acetic Ether and enough of the green coloring to give the desired color, and after standing a few days filter through a glass funnel without using a filter rack or any metallic substance.

4247. Shampoo Liquids.—Two kinds of Shampoo Liquids are used, the "wet" and the "dry," the former being intended to be used with a quantity of Water to wash the head and the other to be applied in small quantities and the hair rubbed until nearly dry. Of the former the two formulas are given.

4248. Barbers' Shampoo.—Carbonate of Potassium (Salts of Tartar) 90 grains, Water of Ammonia 3 fl.ounces, Cologne 2 fl.ounces, Water, sufficient to make 2 pints. Mix and dissolve.

4249. Clifford's Shampoo Compound.—Borax 12 ounces, Salts of Tartar 4 ounces. Mix and dissolve 1 ounce of the mixture in 1 pint of Water when wanted for use.

4250. Dry Shampoo.—Cologne 1 ounce, Alcohol 2 ounces, Water of Ammonia 3 ounces, Water 12 ounces. Mix them. This is applied and the hair rubbed until the lather first formed has dried.

4251. Sea Foam.—Bay Rum 3 fl.ounces, Water of Ammonia 3 fl.ounces, Water 10 fl.ounces. Mix them.

4252. Quillaya Sea Foam.—Tincture of Quillaya 2 ounces, Cologne or Bay Rum 2 ounces, Water 12 ounces. Mix them. This does away with the odor of Ammonia, which is disagreeable to many.

Pomades.

Pomades for the hair are fatty preparations of the consistence of ointments. They were formerly made of beef marrow, suet, washed lard, or a mixture of fats, generally perfumed and colored, but were quite liable to spoil or become rancid by standing. Since the introduction of Petrolatum it has, in this country, taken the place of other fats as a basis for pomades, as it is of about the right consistence, and never becomes rancid nor deteriorates. It is therefore directed in the following formulas, but if preferred, the purified suet directed for making stick pomades (4256) may be used as a base.

4253. Barbers' Pomade.—Petrolatum 16 ounces, Oil of Bergamot 60 minims, Oil of Citronella 20 minims, Oil of Cassia 10 minims, Oil of Cloves 5

minims. Melt the petrolatum and while cooling, but still liquid, add the oils and mix thoroughly. If finer perfume is desired without regard to expense the fine perfumes given under Hair Oils may be used.

4254. Fine Pomades.—By mixing equal parts of Petrolatum with various Flower Pomades No. 24, and, if necessary, adding additional perfume, a great variety of Fine Pomades may be made, as Acacia or Cassia Pomade, Rose Pomade, Orange Flower Pomade, Violet Pomade, etc. They may also be made by mixing Petrolatum with Purified Suet (4256), equal parts, and scenting with fine perfuming Oils as directed for Stick Pomades. It is unnecessary to give detailed formulas.

4255.—Pomade Hongroise or Moustache Wax.—White Wax 1 ounce, Powdered Castile Soap $\frac{1}{2}$ ounce, Gum Arabic, powdered, $\frac{1}{2}$ ounce, Rose Water 1 ounce, Oil of Bergamot 30 minims, Oil of Thyme 3 drops. Melt the Gum Arabic and the Soap in the Rose Water by gentle heat, then, having previously melted the Wax, add it gradually to the mixture, stirring them constantly; while cooling, add the perfume.

It is usually put up in jars or pots.

Stick Pomades or Cosmetics.

These are pomades of much firmer consistence than the foregoing, containing considerable wax, and run in sticks. They are used for the moustache and whiskers, and for making the hair lay where it is wanted.

4256. Stick Cosmetic Base.—Take 10 pounds of fresh Beef Suet, cut it in small pieces, pound it in a mortar and wash it thoroughly several times in pure cold Water. Then put over the fire and slowly "try it out," not allowing it to come to a boil (as that develops the disagreeable animal odor), add to it when melted $2\frac{1}{2}$ drachms powdered Alum and about the same amount of Salt, then let it come to a simmer, remove the scum that rises, and strain through a fine wire or muslin strainer, into a deep dish partly filled with hot Water. Allow it to stand 2 or 3 hours, that all impure matter may settle, then remove from the dish, melt and mix 1 ounce powdered Gum Benzoin, and $\frac{1}{2}$ pint Rose Water, bring to a boil and simmer for a few minutes, skimming off all that rises to the top, add to it $\frac{1}{2}$ gallon boiling water, agitate and stir thoroughly and at last pour off into a shallow pan to cool. This makes the same kind of purified grease that is used in making perfumed Pomades. It will keep for any length of time sweet and pure, without becoming rancid, and is suited well for making any of the harder kinds of Pomades, Cosmetiques, etc.

To make the Stick Pomade, take of the Purified Suet thus prepared $10\frac{1}{2}$ ounces, White Wax or Paraffin $1\frac{1}{2}$ ounce. Perfume as desired. This is sufficient to make 1 dozen 1 ounce sticks of Pomade, which may be made by running in suitable moulds.

The base may be perfumed with the mixtures of perfuming oils as given

under hair oils, or as follows: The quantity of perfuming oils stated being for 12 ounces of the base. This may be variously perfumed with other ingredients, or colored brown with umber, black with ivory black, etc.

- 4257. **Almond Cosmetic.**—30 minims Essential Oil of Almonds.
- 4258. **Bay Cosmetic.**—30 minims Oil of Bay.
- 4259. **Cassia Cosmetic.**—30 minims Oil of Cassia.
- 4260. **Orange Flower Cosmetic.**—20 minims Oil of Neroli.
- 4261. **Rose Geranium Cosmetic.**—30 minims Oil Rose Geranium.
- 4262. **Santalina Cosmetic.**—30 minims Santal Wood Oil, 5 drops Oil Rose.
- 4263. **Verbena Cosmetic.**—20 minims Oil Lemon Grass.
- 4264. **White Rose Cosmetic.**—10 minims Oil Rose, 3 minims Oil Patchouly.
- 4265. **Ylang Ylang Cosmetic.**—10 minims Oil Ylang Ylang, 3 minims Oil Rose.

Hair Powders.

For powdering the hair *white* ordinary powdered starch scented with some kind of bulk perfume is generally used. The perfume may be rubbed with a small quantity of the powder first and then with the remainder gradually added.

Silver powder is made from mica, coarsely ground, and *gold* powder from gold colored mica or Tinsel ground or finely cut.

COSMETIC ICES AND JELLIES.

The most familiar preparation of this kind is Camphor Ice, which is considerably used for sun-burn, tan, chap, chafe, etc. Cold cream is a softer preparation much used for the same purpose. Formulas for both of these have been given under other headings (3709), (4094), and a few only will be given here.

4266. **Camphor Ice with Glycerin.**—Paraffin or White Wax 4 ounces, White Petrolatum or Washed Lard 12 ounces, Camphor 3 ounces, Glycerin 3 ounces, Oil of Bitter Almond 20 minims, Oil of Rose 5 minims, Oil of Cloves 5 minims. Melt the Paraffin and Petrolatum together and remove from the fire, add the Camphor in powder and keep warm until the Camphor is dissolved, then strain, and while cooling add the Glycerin and Perfuming Oils, beating them well together until it is cool enough to set, when run into cold moulds or a flat pan on ice. It may then be cut up as desired.

4267. **Carbolated Camphor Ice.**—This may be made by adding 2 ounces of Carbolic Acid to the ingredients of the formula 4094.

4268. Carbolated Camphor Ice with Glycerin.— This may be made by adding 1 ounce of Carbolic Acid to the ingredients of the formula for Camphor Ice with Glycerin (4266).

4269. Glycerin, Honey or Jelly.— *Solidified Glycerin.*— Transparent Soap 4 ounces, Water 6 ounces, Glycerin 12 ounces, Oil Bergamot 20 minims, Oil Cloves 10 minims, Oil Bitter Almonds 5 minims. Cut the Soap in thin shavings and dissolve in an evaporating dish with the Water, when dissolved add the Glycerin and boil for one hour or until the vapor of Water no longer rises, and the liquid measures only 1 pint, when nearly cool stir in the essential oils and pour into a shallow pan or boxes designed for the preparation; the perfume may be varied to suit, by using other combinations. This makes transparent Jelly.

4270. Glycerin Jelly.— Another method of making this is as follows: White Castile Soap, in powder, 140 parts, Pure Glycerin 210 parts, Oil of Almonds, expressed, 1260 parts for winter use, or 1680 parts for summer use, Oil of Bergamot 8 parts, Oil of Rose 2 parts, Oil of Lavender 4 parts, mix the powdered Soap and the Glycerin in a Mortar, then add the Oil of Almonds and incorporate it by triturating rapidly and add the perfume. This Jelly is not transparent.

4271. Camphorated Glycerin Honey or Jelly.— This may be made by adding $\frac{1}{2}$ ounce of Powdered Camphor to the Glycerin Honey while warm.

4272. Carbolated Glycerin Honey.— This may be prepared by adding Carbolic Acid $\frac{1}{4}$ ounce to the Glycerin Honey while warm, the same may also be added to the Camphorated Glycerin Honey if desired.

4273. Glycerine Ice.— Gelatine 2 ounces, Water 6 ounces, Glycerin 14 ounces, perfuming Oils to suit. Dissolve the Gelatin in the Water by the heat of a water-bath, add the Glycerin previously heated, boil until only 1 pint remains and strain, while cooling incorporate the perfumes, and pour into shallow tins, this may be colored red or other color if desired. It resembles Ice. To apply it the skin should first be moistened with Water and the cake rubbed over it.

4274. Glycerine Jelly.— Gelatin 1 ounce, Glycerin 1 pint, Boric Acid, in fine powder, 2 drachms, Water 1 pint, Bulk Perfume 1 or 2 ounces. Soak the Gelatin in the Water until soft, then heat until dissolved, add the Glycerin and Boric Acid and strain while cooling, add the perfume and mix thoroughly, this is a thin or soft Jelly and should be put up in pots or jars. It is an excellent preparation for chaf, chafe and roughness of the skin.

4275. Arnica Jelly.— This may be made by adding 4 fl.ounces of Tincture of Arnica to the Solution of Gelatin, and boiling the solution until only 1 pint remains, then adding the Glycerin, etc., as before. The firm Arnica Jelly may be made by adding Tincture Arnica 2 ounces, to each pint of any of the former preparations before adding the Glycerin, etc., other substances may be combined with the Jellies in the same manner.

LOTIONS.

Lotions are intended to whiten and soften the skin, remove pimples, tan, freckles, sunburn, etc. The milks are also included under this heading, as they are employed for similar purposes.

4276. Moth and Freckle Lotion.—Bichloride of Mercury 60 grains, Chloride of Ammonium 240 grains, Alcohol 3 fl.ounces, Rose or Orange Flower Water 3 fl.ounces, Water 10 fl.ounces. Rub the corrosive sublimate to a fine powder and dissolve it in the Alcohol, dissolve the Chloride of Ammonium in the Water, add the Rose or Orange Flower Water and mix with the Alcoholic solution, after standing a day or two, filter. This may be applied once or twice a day with a soft sponge or linen cloth and will quickly remove moth or freckles, tan, etc.

4277. Anti-Freckle Lotion.—Bichloride of Mercury 12 grains, Hydrochloric Acid 3 fl.drachms, Bitter Almonds 1½ ounces, Glycerin 1 ounce, Tincture Benzoin 2 drachms, Orange Flower Water sufficient to make 1 pint. Dissolve the Bichloride of Mercury in 3 ounces of the Orange Flower Water, add the Hydrochloric Acid and set aside. Blanch the Almonds and bruise them to a paste in a mortar with the Glycerin and add sufficient Orange Flower Water to make about 12 ounces of Cream or Milk of Almonds, add to this the Tincture of Benzoin, drop by drop, rubbing them well together, then add the solution of Bichloride of Mercury, and enough Orange Flower Water to make a pint and strain the whole forcibly through a cheese cloth strainer to remove the coarser particles of Almond.

4278. Freckle Lotion.—Sulpho-Carbolate of Zinc ¼ ounce av., Glycerin 3 ounces av., Alcohol 2 fl.ounces, Orange Flower Water 3 fl.ounces, Rose Water sufficient to make a pint. Mix, dissolve and filter.

4279. Face Lotion.—Bitter Almonds, Sweet Almonds, each, 1 ounce, Oil of Almonds 1 ounce, Spermaceti ½ ounce, Borax, in powder, ¼ ounce, Glycerin 4 ounces, Rose or Orange Flower Water sufficient to make a pint. Blanch the Almonds and reduce them to a uniform paste, by beating in a mortar and then rubbing with the Glycerin. Rub the Spermaceti in another mortar previously warmed with the Oil of Almonds, and beat until dissolved. Dissolve the Borax in half a pint of the perfumed Water, and having gradually added the warm Oil solution to the emulsion of Almonds in the mortar, rubbing them constantly, then add the solution of Borax and shake them well together, then add enough of the perfumed Water to make a pint and strain the mixture through coarse cheese cloth to remove larger particles of Almond.

4280. Pimple Lotion.—Carbolic Acid 1 drachm, Borax 4 drachms, Glycerin 2 fl.ounces, Tannin 2 drachms, Alcohol 3 fl.ounces, Rose Water 10 fl.ounces, mix and dissolve. Apply night and morning.

4281. Milk of Almonds.—Bitter Almond, Sweet Almond, each 1 ounce, Alcohol, Glycerin, each, 3 ounces, Oil of Bitter Almonds 30 minims, Water

sufficient to make a pint. Blanch the Almonds, beat to a paste, add the Glycerin, dissolve the Oil of Almonds in the Alcohol and add, then add enough Water to make a pint and strain through cheese cloth to remove the coarser particles of Almond. This may also be made by mixing $1\frac{1}{2}$ ounce Expressed Oil of Almond with 8 ounces of Water, in which $\frac{1}{2}$ ounce of Borax has been dissolved and adding to the mixture 3 ounces of Glycerin, and 3 ounces of Alcohol in which 10 drops of Essential Oil of Almond is dissolved, and Water enough to make 1 pint. This is used as a bland application for sunburn, tan, etc., also as a vehicle for other medicinal substances.

4282. Milk of Roses.— This may be made in the same manner as Milk of Almond, except that Oil of Rose 15 drops, instead of Essential Oil of Bitter Almond, and Rose Water instead of Water, are to be used with the other ingredients. Another formula is Sweet Almonds, blanched, 4 ounces, Rose Water 1 pint, Alcohol 2 ounces, Oil of Rose 20 minims, White Wax, Spermaceti, Castile Soap, each, 2 drachms. The Almonds are blanched and beat with the Rose Water; the Wax Soap and Spermaceti are melted together by water-bath and the Almond Emulsion is gradually mixed by rubbing in a warm mortar with the melted ingredients. The Alcohol in which the Oil of Rose is dissolved is then added to the mixture. By using Pistachio Nuts instead of Almonds, a finer preparation may be made.

4283. Lait Virginal.— Tincture of Benzoin $\frac{1}{2}$ ounce, Cologne 2 ounces, Glycerin 2 ounces, Rose Water or other Perfumed Water 12 ounces; mix the Tincture of Benzoin with the Cologne, and having mixed the Water and Glycerin arrange a funnel in such a manner that the latter mixture will fall drop by drop into the former, by which process little or no precipitation of the resinous matter is formed, but a fine, smooth, milky preparation is produced. This is much used as a wash for the complexion. Tincture of Myrrh, or Tincture of Tolu, may be used instead of Tincture of Benzoin in this preparation.

4284. Glycerin Lotions.— Quite a variety of preparations are sold as Glycerin Lotions, the most common being *Rose Water and Glycerin*, equal parts of each, mixed; or two parts of Rose Water to one of Glycerin. *Lime Juice and Glycerin*, usually made with equal parts of Lime Juice, Glycerin Rose Water, is also a favorite application for tan and freckles, and is sometimes applied to the hair. Other Waters may be used instead of Rose Water; Cherry Laurel or Orange Flower Water, making fine preparations.

4285. Hair Gloss.— Glycerin 12 ounces, Cologne 4 ounces. Mix them. Hair Gloss may also be made with Glycerin and Rose Water, or Orange Flower Water, mixed equal parts by measure.

LIP SALVES AND COSMETICS.

Lip Salves are used for softening the lips, preventing them from cracking, curing sores, etc., and are sometimes employed to impart

a color to them. The following formulas will suffice. Lip Salves are usually put up in small metal, glass or porcelain boxes.

4286. Lip Salve.—Oil of Sweet Almond 4 ounces, White Wax, Spermaceti, each, 1 ounce, Essential Oil of Almonds, Oil of Bay Leaves, each, 15 drops. Melt the Wax and Spermaceti together, add the Almond Oil and while cooling the Perfuming Oils, and stir constantly until cold.

4287 Lip Salve.—The foregoing preparation is liable to deteriorate by age, this one will keep indefinitely and is to be preferred. Petrolatum 8 ounces, White Wax or Paraffin 1 ½ ounce, Tannin 1 drachm, Oil of Lavender, Oil of Bergamot, each, 1 drachm, Oil of Rose Geranium 2 drachms. Melt the Petrolatum and wax together and add the Tannin; while cooling, add the oils and stir until cold.

4288. Coral Lip Salve.—This may be made by adding to either of the foregoing formulas, 10 grains of Carmine for each ounce of the lip salve. It is best reduced to a fine powder in a mortar and then rubbed with a small portion of the salve, to a smooth mass, the remainder being gradually mixed with it.

NAIL COSMETICS.

Powder and ointment for the nails is sometimes called for as toilet preparations, and may readily be made by druggists.

4289. Nail or Manicure Powder.—This is for polishing, smoothing and cleaning the nails. Pumice Stone, in powder, 8 ounces, Powdered French Chalk 2 ounces, Carmine No. 40, in powder, 1 drachm, Bulk Perfume, Rose or Violet ½ ounce.

4290. Nail or Manicure Salve.—This is for softening the nails, curing hang nails, etc. Petrolatum 1 ounce, Castile Soap, in powder, 1 drachm, Oil of Bergamot 10 drops, or other more expensive perfuming Oils if desired. Mix them thoroughly. This is to be applied at night and the fingers covered with gloves.

PERFUMES FOR THE HANDKERCHIEF.

Handkerchief Extracts, or "Perfumes" as they are popularly called, are kept by nearly all druggists and constitute quite an important part of their trade. It will be inexpedient in this volume to give anything but a brief outline of the manner of making them, and a very few formulas for the more popular odors. They are made by but few druggists, — not because they are difficult to make, but because it is difficult and expensive to obtain the material requisite to manufacture them. The following are the extracts, essences,

etc., necessary to be made and kept on hand for the manufacture of perfumes. The processes are adapted to the conveniences always at hand. Perfume Laboratories are supplied with machinery for the purpose.

CLASS A.

Extracts of Flowers from Pomades.

The Pomades used for making these Extracts are prepared by *Eufleurage* (see page 645), and may be obtained of perfumers and New-York jobbers. They cost from \$2.00 to \$2.50 per pound, some of them, as Violet, costing much more.

4291. To make Triple Extracts from Pomades.—*First.* Take equal parts, by weight, of the required Pomade and the strongest Cologne Spirit (Deodorized Alcohol). Divide the Pomade into three equal parts, and put one part (one-third) of the Pomade and all of the Cologne Spirit in a glass or copper jar that will hold double the quantity, and can be stopped air-tight. (An ordinary glass fruit jar is just the thing for small quantities.)

Put the jar in a water-bath, and keep at only a moderate heat (just sufficient to keep the Pomade melted) for three or four days, agitating frequently, then remove from the water-bath, cool, and pour the liquid extract from the Pomade. This product may be termed the Single Extract.

Second. Take another part (one-third) of the fresh Pomade, and macerate it in the same manner as before, with the Extract which has been obtained from the first maceration. This product may be termed the Double Extract.

Third. Take the remaining third of the fresh Pomade, and macerate it in the same manner as before, with the product of the previous macerations.

When this maceration is completed, surround the jar containing the Pomade and Extract with ice, that all particles of fatty matter may be congealed. When thoroughly cold, pour off the Extract, straining through a little cotton wool into bottles, and keep closely stopped.

This constitutes the Triple Extract, and is the finest and strongest Extract that can be obtained.

The Pomade that remains after the Extract has been poured off may be again treated in a similar manner with Fresh Cologne Spirit, and the product will be a very fine Extract, but not as strong as the first. It will, perhaps, about correspond to the Single Extract, which may be used for another batch, or for making Colognes or cheap Perfumes.

After the Pomade has been thus successively treated, it is called Washed Pomade, and is very good for making Cosmetics and Pomades for the hair.

The following list embraces the Extracts made in the manner described, from Pomades readily obtainable in the market.

4292. Triple Extract Cassie or Acacia.—From Cassie Pomade.

4293. Triple Extract Jasmine.—From Jasmine Pomade.

4311. **Essence Santal.**— { Oil Santalwood (true), 1 part,
 { Cologne Spirit, 20 parts.
4312. **Essence Ylang Ylang.**— { Oil Ylang Ylang, 1 part,
 { Cologne Spirit, 60 parts.

CLASS C.

Extracts or Tinctures from Odorous Substances.

These are Extracts or Tinctures of Odorous Substances that are used in Perfumes, chiefly to give permanence to the more volatile odors. They should be kept on hand ready to combine as desired. Most of them require long maceration to extract their odorous principle.

4313. **Extract Ambergris.**— { Ambergris, 1 part,
 { Cologne Spirit, 60 parts.

Rub the Ambergris fine and macerate for thirty days in warm place, in a tightly stopped bottle.

4314. **Extract Angelica.**— { Angelica Root (true), 1 part,
 { Cologne Spirit, 4 parts.

Reduce the Angelica Root to coarse powder, and macerate for thirty days with the Cologne Spirit. Press out and filter.

4315. **Extract Civet.**— { Civet, 1 part,
 { Cologne Spirit, 60 parts.

Macerate for thirty days in a tightly stopped bottle in a warm place.

4316. **Extract Musk.**— { Fine Grain Musk, 2 parts,
 { Carbonate of Potassium, 1 part,
 { Cologne Spirit, 120 parts.

Macerate for thirty days in a warm place in a tightly stopped bottle.

4317. **Extract Musk Root or Sumbul.**— { Sumbul Root, . . . 1 part,
 { Cologne Spirit, . . . 4 parts.

Reduce the Musk Root to a coarse powder, and macerate for thirty days. Express and filter.

4318. **Extract Musk Seed or Ambrette.**— { Musk Seed, . . . 1 part,
 { Cologne Spirit, . . 4 parts.

Macerate for thirty days. Express and filter.

4319. **Extract Orris or Violet.**— { Orris Root, 3 parts,
 { Cologne Spirit enough to
 make 4 parts.

Reduce the Orris Root to a coarse powder, and macerate for thirty days with four parts of Cologne Spirit, then transfer to a percolator and percolate, adding fresh Spirit through the percolator until four parts are obtained. This is much used as a substitute for Violet.

4320. **Extract Tonqua.**— { Tonqua Beans, 1 part,
 { Cologne Spirit, 9 parts.

Cut the beans fine, crush, and macerate for thirty days.

4321. **Extract Vanilla.**— { Vanilla, 1 part,
Cologne Spirit, 9 parts.

Cut the Vanilla in fine pieces and rub with White Sand to a coarse powder, add the Cologne Spirit and macerate for thirty days in a warm place.

4322. **Extract Wild Ginger.**— { Wild Ginger (Canada Snake
Root), 1 part,
Cologne Spirit, 4 parts.

Reduce the drug to a coarse powder, and macerate for thirty days in the Cologne Spirit. Express and filter.

Balsam Peru, Tolu, Benzoin, Styrax, and some other odoriferous bodies are also used in perfumes, but no special extract need be prepared of them, 1 part to 9 of Cologne Spirit being used to make an extract or tincture.

The druggist will, of course, make up these preparations in such quantities only as his trade demands, but it is best to have some of each kind on hand.

The Citrine Oils, Bergamot, Lemon and Orange, change quickly if not dissolved in spirit, and it will be found advantageous to dissolve these, while fresh, in Cologne Spirit, and keep them in this way.

ODORS OF FLOWERS,

Or Handkerchief Extracts.

Having now prepared the elements, as they may be termed, of Perfumery (Classes A, B and C), the druggist may prepare any combination that may be desired. The formulas which follow are for those which have the most sale on the market, and which time has demonstrated to be good and salable perfumes. There may be of course as many combinations of odors as there are stars in the heavens: but it is not best to encourage a multiplicity of odors, but rather a familiarity with a few good ones, which will soon come to be favorites with the customers of the druggist.

Since the introduction of bulk perfumes, many old and favorite odors have gone out of use, and many new ones come in. No standard has yet been established for many of the newly-named perfumes, and they are put up as the fancy of the fabricateur and the harmony of odors may direct.

The formulæ which follow make only the best grade or quality of perfumes. If the druggist desires to make cheaper goods, any of these may be diluted with Cologne Spirit to meet the desired cost. And in fact this is much better than to try to make them cheaper by using inferior material, because, although they may be weak, they will preserve their purity and delicacy of odor.

For other combinations our readers are referred to more elaborate works on the subject, and to the published formulas from reliable sources.

The essences, extracts, etc., which are directed to be used in the formulas are those which are given in the foregoing classes.

4323. Essence Bouquet—*Esprit de Bouquet*.—Essence Rose 8 parts, Essence Lemon 1 part, Essence Bergamot, Extract Orris, each, 4 parts, Extract Ambergris, Essence Santal, each, 1 part. Mix.

4324. Extract Frangipanni.—Essence Neroli, Essence Rose, each, 2 parts, Essence Santal, Essence Cassia, Essence Rose Geranium, each, 1 part, Extract Musk, Extract Ambergris, Extract Civet, each, 1 part, Triple Extract Tuberose, Triple Extract Orange Flowers, each, 2 parts, Cologne Spirit 5 parts. Mix.

4325. Extract Jockey Club.—Triple Extract Rose, Triple Extract Tuberose, each, 4 parts, Triple Extract Cassie, Triple Extract Jasmine, each, 2 parts, Extract Orris 3 parts, Extract Ambergris, Extract Civet, each, 1 part, Essence Rose 2 parts, Cologne Spirit 5 parts. Mix.

4326. Extract Lily of the Valley.—Triple Extract Tuberose 8 parts, Triple Extract Jasmine 1 part, Triple Extract Orange Flower, Triple Extract Cassie 2 parts, Triple Extract Rose 4 parts, Essence Ylang Ylang 1 part, Essence Almonds $\frac{1}{4}$ part, Extract Vanilla 3 parts, Cologne Spirit 5 parts. Mix.

4327. Extract Musk.—Extract Musk 10 parts, Extract Civet, Extract Ambergris, Extract Musk Seed, each, 4 parts, Essence Rose 3 parts, Extract Wild Ginger 1 part, Cologne Spirit 5 to 20 parts, according to strength desired. Mix.

4328. Extract Night Blooming Cereus.—Triple Extract Rose 8 parts, Triple Extract Orange Flower 2 parts, Essence Neroli 2 parts, Extract Vanilla 2 parts, Extract Orris 3 parts, Extract Musk, Extract Civet, each, 1 part, Essence Almond $\frac{1}{10}$ part, Tincture Benzoin $\frac{1}{10}$ part. Mix.

4329. Extract Mary Stewart.—Triple Extract Rose 3 parts, Triple Extract Cassie 1 part, Triple Extract Tuberose 2 parts, Essence Rose 3 parts, Essence Ylang Ylang 2 parts, Essence Rose Geranium 2 parts, Essence Orange $\frac{1}{4}$ part, Extract Orris 2 parts, Extract Musk 1 part, Extract Ambergris 1 part, Tincture Benzoin, Extract Tonqua, each, $\frac{1}{4}$ part, Cologne Spirit 5 parts. Mix.

4330. Extract Ilang-Ilang, or Ylang-Ylang.—Essence Ylang-Ylang 8 parts, Essence Rose 2 parts, Extract Orris 2 parts, Triple Extract Jasmine, Extract Musk, Essence Orange, each 1 part. Mix.

4331. Extract Ocean Spray, or Sea Breeze.—Triple Extract Jasmine, Triple Extract Cassia, each, 4 parts, Triple Extract Rose 6 parts, Essence Bergamot, Essence Lavender, each, 3 parts, Essence Santal 1 part, Extract Ambergris, Extract Civet, each, 1 part, Cologne Spirit 5 parts. Mix.

4332. Extract Patchouly.—Essence Patchouly 8 parts, Essence Rose, Essence Rose Geranium, each, 2 parts, Cologne Spirit 4 parts. Mix.

4333. Extract Wild Olive.—Triple Extract Rose 8 parts, Triple Extract Jasmine, Triple Extract Violet, each, 4 parts, Triple Extract Cassie 2 parts, Essence Rose 4 parts, Essence Ylang Ylang 2 parts, Extract Musk, Essence Ambergris, each, $\frac{1}{2}$ part, Cologne Spirit 5 parts. Mix.

4334. Extract White Rose.—Triple Extract Rose, Triple Extract Violet (or Extract Orris), Essence Rose, each, 4 parts, Triple Extract Jasmine 2 parts, Essence Patchouly 1 part. Mix. This may be diluted with 4 parts of Cologne Spirit if desired.

4335. Extract Stephanotis.—Triple Extract Cassie, Triple Extract Tuberose, each, 4 parts, Triple Extract Jasmine 2 parts, Essence Rose 3 parts, Extract Musk, Extract Tonqua, Essence Neroli, each, 2 parts, Extract Orris 8 parts, Extract Wild Ginger 1 part, Tincture Benzoin 1 part, Cologne Spirit 5 parts. Mix.

4336. Extract Upper Ten.—Triple Extract Rose, Triple Extract Jasmine, Triple Extract Violet (or Extract Orris), each, 6 parts, Extract Musk 4 parts, Cologne Spirit 6 parts. Mix.

4337. Extract Violet—*Finest.*—Triple Extract of Violet (from pomade) 16 parts, Triple Extract Cassie 3 parts, Extract Orris 4 parts, Tincture Tolu 1 part, Tincture Vanilla 1 part, Cologne Spirit 6 parts. Mix.

4338. Extract Violet—*Good.*—A good Extract of Violet, such as is ordinarily sold, may be made with Triple Extract Cassie 2 parts, Triple Extract Rose, Triple Extract Tuberose, each, 1 part, Extract Orris 6 parts, Essence Almonds $\frac{1}{20}$ part, Tincture Tolu 1 part, Cologne Spirit 3 parts. Mix.

The formulæ given for handkerchief extracts are merely sample formulas representative of combinations that are popular on the market. A great variety of other odors by various names are found, and may be made by druggists by combining various extracts, essences, etc.

COLOGNES AND TOILET WATERS.

Colognes are fragrant compounds of much less strength and permanence of odor than the foregoing Extracts.

In addition to their legitimate use as toilet waters, they now take the place, to a large extent, of the cheaper grades of perfume that were formerly sold.

As with the Handkerchief Extracts, the combinations that may be made are almost infinite, though but few have ever met with great public favor.

The formulæ which follow represent those most widely known and esteemed as Colognes; but, as any of the Handkerchief Extracts

may be made into Colognes, by following the "General Cologne Formula," the druggist may choose such as suits his fancy, and have as large a variety as he pleases.

Colognes prepared from the Handkerchief Extracts may also be put up as cheap perfumes; the grades that the druggist wishes to prepare may be regulated by the amount of Cologne Spirit added.

For second grade perfumes, taking Handkerchief Extract 1 part, Cologne Spirit 1 part.

For third grade perfumes, taking Handkerchief Extract 1 part, Cologne Spirit 2 parts, and for Colognes, the following *General Cologne Formula*: Handkerchief Extract 1 part, Cologne Spirit 3 parts, Water (distilled) * q. s.

Mix the Extract with two and a half parts of the Cologne Spirit, and add Water gradually until, when shaken up, it remains, after standing a short time, just a trifle cloudy or milky, then add the balance of the Cologne Spirit, and set away for a month or more before using.

These Colognes may be named from the Extracts of which they are made, as White Rose Cologne, Marie Stewart Cologne, Upper Ten Cologne, etc., and the druggist may have no lack of cheaper grades of perfumes and Colognes by following these directions.

4339. Farina Cologne.—Essence Bergamot 10 parts, Essence Neroli 1 part, Essence Lavender 2 parts, Essence Lemon 2 parts, Essence Orange 2 parts, Essence Cloves 1 part, Essence Cassia 1 part, Essence Rose 2 parts, Essence Rose Geranium 1 part, Triple Extract Jasmine 6 parts, Extract Angelica 1 part, Extract Orris 3 parts, Extract Musk Seed 2 parts, Essence Nutmeg 1 part, Essence Spearmint 2 parts, Essence Cedrat, 2 parts, Essence Thyme $\frac{1}{2}$ part, Essence Cajeput $\frac{1}{2}$ part, Cologne Spirit 400 parts, Distilled Water 60 parts. Mix the Essences, etc., with the Cologne Spirit, and gradually add the Water. If it should remain milky after the addition of the Water, add enough Cologne Spirit to clear.

4340. Floral Cologne.—Essence Bergamot 10 parts, Essence Cassia 4 parts, Essence Orange 6 parts, Essence Lavender 2 parts, Essence Lemon 6 parts, Essence Santal 2 parts, Essence Neroli 2 parts, Essence Rose Geranium 4 parts, Extract Orris 4 parts, Extract Tonqua 2 parts, Extract Ambergis 2 parts, Cologne Spirit 300 parts, Rose Water 50 parts. Mix the Essences, etc., with the Cologne Spirit, and gradually add the Rose Water. If milky after standing, add enough Cologne Spirit to make clear.

4341. German Cologne, A. 1.—Essence Rose Geranium 8 parts, Essence Orange 10 parts, Essence Cassia 6 parts, Essence Bergamot 10 parts, Essence Cloves 1 part, Essence Neroli 2 parts, Essence Lavender 4 parts, Essence

* If Rose Water or Orange Flower Water is added instead of Distilled Water, the product will be finer. Rose Water may be used with all Extracts, but Orange Flower Water is preferable in those compounds which contain Triple Extract Orange Flowers or Essence Neroli.

Rose 4 parts, Essence Verbena 2 parts, Essence Santal 4 parts, Extract Ambergis 1 part, Extract Musk 1 part, Tincture Cardamom 1 part, Cologne Spirit 300 parts, Rose Water 50 parts. Mix the Essences, etc., with the Cologne Spirit, add the Rose Water gradually, and then if milky, enough more Cologne Spirit to make clear.

4342. German Cologne, 2d.—Essence Bergamot 10 parts, Essence Lemon 6 parts, Essence Orange 6 parts, Essence Rosemary 6 parts, Essence Cassia 4 parts, Extract Orris 4 parts, Extract Tonqua 2 parts, Extract Musk Seed 4 parts, Extract Angelica 1 part, Extract Wild Ginger 2 parts, Tincture Benzoin 1 part, Cologne Spirit 400 parts, Rose Water 60 parts. Mix the Essences, etc., with the Cologne Spirit, add the Rose Water gradually, and if milky, enough more Cologne Spirit to make clear.

4343. Lavender Cologne, or Water.—Essence Lavender 3 parts, Essence Lemon 2 parts, Essence Cassia 1 part, Essence Cloves 1 part, Essence Santal 1 part, Cologne Spirit 60 parts, Water 10 parts. Mix the Essences with the Cologne Spirit, add the Water gradually, and then enough Cologne Spirit to clear, if milky.

4344. Musk Cologne.—Essence Bergamot 2 parts, Essence Lavender 2 parts, Essence Lemon 4 parts, Essence Neroli, 1 part, Extract Musk 4 parts, Cologne Spirit 60 parts, Rose Water 10 parts. Mix the Essences, etc., with the Cologne Spirit, add the Rose Water gradually, and then enough Cologne Spirit to make clear, if milky.

4345. White Rose Cologne.—Oil Neroli Bigarade 1 drachm, Oil Neroli, Petit grain, $\frac{1}{2}$ drachm, Oil Bergamot 2 drachms, Oil Patchouly 1 drachm, Oil Rose 3 drachms, Extract Musk 2 ounces, Tincture Tolu 2 ounces, Cologne Spirit 7 pints, Rose Water 1 pint. Dissolve the Oils in the Spirit, and add the Rose Water, let stand 30 days, and filter.

4346. Hoyt's German Cologne.—The following formula has been published as similar to Hoyt's German Cologne: Oil Bergamot 1 ounce, Oil Lemon 1 ounce, Oil Neroli $\frac{1}{4}$ ounce, Oil Santal Wood $\frac{1}{2}$ ounce, Camphor 20 grains, Cologne Spirit 7 pints, Rose Water 1 pint. Mix and let stand a month, then filter.

4347. Florida Water.—Oil of Lavender Flowers, English, 6 fl.drachms, Oil of Bergamot 2 fl.drachms, Oil of Lemon $1\frac{1}{2}$ fl.drachm, Oil of Cloves 20 minims, Oil of Cassia 10 minims, Oil of Orange 30 minims, Essence Rose 60 minims, Essence Neroli 10 minims, Cologne Spirit 15 fl.ounces. Mix them.

4348. Violet Water.—This may be made by diluting Extract of Violet with 4 parts of Cologne Spirit. Other Toilet Waters may be made in the same general manner.

4349. Other Colognes and Toilet Waters may be made by the general formula. They may be made as the fancy of the maker may select, and may be made stronger or weaker as may be desired, to correspond with the trade for which they are made.

SACHET POWDERS.

A great variety of Sachet Powders may be made by adding to an Aromatic Base, composed of Ground Roots, Barks, Woods, Flowers, Leaves, etc., Bulk Perfumes or Essential Oils. A few formulas for the best selling powders are given here, and others may be made in the same general way.

4350. General Base for Sachet Powder.—Orris Root, in coarse powder, 1 pound, Santal Wood, ground, 4 ounces, Vanilla Beans, ground or cut fine, 1 ounce, Rose Leaves, (flowers,) ground, 6 ounces, Extract Musk, $\frac{1}{2}$ ounce, Extract Civet, $\frac{1}{2}$ ounce. Mix them well together. To make any variety of Sachet Powder, add to 8 ounces of this 1 ounce of the Bulk Perfume, of the kind desired and mix them thoroughly.

The following are formulas for those most popular :

4351. Frangipani Sachet.—Powdered Orris 3 pounds, Ground Vitivert $\frac{1}{4}$ lb., Ground Santal $\frac{1}{4}$ pound, Ground Vanilla Beans $\frac{1}{4}$ pound, Ground Tonquin Beans 2 ounces, Oil Neroli 60 minims, Oil Santal 40 minims, Oil Bergamot 60 minims, Oil French Geranium 60 minims, Otto Rose 30 minims, Extract Musk 1 ounce, Extract Civet $\frac{1}{2}$ ounce. Mix well.

4352. Heliotrope Sachet.—Powdered Orris $2\frac{1}{2}$ pounds, Ground Rose Leaves 1 pound, Ground Vanilla Beans 6 ounces, Ground Tonquin Beans 4 ounces, Extract Musk $1\frac{1}{2}$ ounces, Extract Civet $\frac{1}{2}$ ounce, Essential Oil of Almonds 7 minims. Mix.

4353. Rose Sachet.—Powdered Orris $\frac{1}{2}$ pound, Ground Rose Leaves $1\frac{1}{2}$ lbs., Ground Santal Wood 4 ounces, Ground Patchouly 2 ounces, Extract Civet $\frac{1}{2}$ ounce, Oil French Geranium 30 minims, Otto Rose 20 minims. Mix.

4354. Jockey Club Sachet.—Powdered Orris 3 pounds, Ground Santal Wood $\frac{1}{2}$ pound, Oil Bergamot 1 ounce, Otto Rose 30 minims, Extract Musk 2 ounces, Extract Civet 1 ounce.

4355. Essence Bouquet Sachet.—Powdered Orris 4 pounds, Ground Cassie Leaves (Flowers) 1 pound, Ground Rose Leaves (Flowers) 1 pound, Ground Vanilla Beans 3 ounces, Essence Bergamot 1 ounce, Essence Lemon 1 ounce, Oil French Geranium 60 minims, Extract Musk 2 ounces, Extract Ambergis $\frac{1}{2}$ ounce.

4356. Ylang-Ylang Sachet.—Ground Rose Leaves 1 pound, Ground Cassie Leaves 1 pound, Ground Pimento $\frac{1}{4}$ pound, Ground Tonquin Beans 2 ounces, Ground Vanilla Beans 2 ounces, Powdered Orris 3 pounds, Oil Pimento 60 minims, Oil Bergamot 120 minims, Oil French Geranium 60 minims, Oil Ylang-Ylang 120 minims, Otto Rose 20 minims, Extract Musk 1 ounce, Extract Civet $\frac{1}{2}$ ounce, Gum Benzoin (Ground) 1 ounce. Mix.

4357. Violet Sachet.—Powdered Orris 3 pounds, Essence Bergamot 30 minims, Essential Oil of Almonds 20 minims, Otto Rose 20 minims, Extract Musk 1 ounce. Mix.

4358. Pot Pouri for Rose Jars.—Mixtures of Rose Leaves, etc., for filling Rose Jars are now considerably used. A favorite mixture for this purpose is as follows : Rose Leaves (Flowers) whole, 1 pound, Patchouly Leaves 4 ounces, Violet Flowers 4 ounces, Vanilla, cut fine, $\frac{1}{2}$ ounce, Cinnamon, in coarse powder, $\frac{1}{2}$ ounce, Orris Root, in coarse powder, 4 ounces, Allspice, in coarse powder, $\frac{1}{2}$ ounce, Cloves, in coarse powder, $\frac{1}{4}$ ounce, Oil Bergamot $\frac{1}{2}$ ounce, Musk Extract 1 ounce. Mix the Oil and Musk Extract thoroughly with the powdered drugs, and then with the Leaves, etc. By grinding the Leaves, etc., to a coarse powder, this may be used as a Sachet Powder ; other combinations may be made in the same manner, by using other flowers, etc., in combination, as Lavender, Vitivert, etc.

SMELLING SALTS OR PUNGENTS.

The sale of Smelling Salts, or "Pungents," which, for a time was quite limited, has again revived. The following formulas make satisfactory preparations:

4359. Pungent Smelling Salts.—If something fine is desired without regard to cost this is recommended : Carbonate of Ammonium, crushed into a coarse powder, 6 ounces, Sal Ammoniac, granulated, 1 ounce, Pure Potash (Caustic Potash), crushed fine, 2 ounces, Orris Root, in coarse powder, 4 ounces, Lemon Peel, in coarse powder, Rosmary Leaves, in coarse powder, Lavender Flowers, in coarse powder, each, 1 ounce, Cloves, Cinnamon, Calamus, each, in powder, $\frac{1}{2}$ ounce, Oil of Bergamot $\frac{1}{2}$ ounce, Oil of Lemon 2 drachms, Extract of Musk or Civet $\frac{1}{2}$ ounce, Stronger Water of Ammonia $\frac{1}{2}$ ounce. Mix them well together.

4360. Smelling Salts.—A more common article may be made as follows : Carbonate of Ammonium, crushed to a coarse powder, 12 ounces, Powdered Orris 4 ounces, Powdered Cloves, Powdered Cassia, Powdered Calamus, each, 1 ounce, Stronger Water of Ammonia 1 ounce, Oil of Bergamot $\frac{1}{2}$ ounce, Oil of Lavender $\frac{1}{4}$ ounce. Mix them.

4361. Preston's Salts.—Carbonate of Ammonium, crushed, 4 ounces, stronger Water of Ammonia $\frac{1}{4}$ ounce, Oil of Cloves, Oil of Lavender, Oil of Bergamot, each 10 drops. Mix them well together.

4362. Smelling Salts.—*Extemporaneous.*—By crushing Carbonate of Ammonium, and adding to each ounce 30 drops of Stronger Water of Ammonia, and 30 drops of Bulk Perfume.

4363. Vinegarettes.—These are employed like smelling bottles and for similar purposes. Any inert Aromatic substance, as Orris or a mixture of Aromatic powdered drugs, may be saturated with Glacial Acetic Acid with which one-fourth the quantity of Bulk Perfume is mixed. The Toilet Vinegars mentioned further on, may also be employed for the same purpose.

TOILET SOAPS.

Toilet Soaps are seldom made except by experienced soap makers. The bases of Toilet Soaps are the common hard soaps referred to under the article on soaps, page 738. For making the finer grades of Toilet Soaps these are shaved, "milled" or ground, and mixed as may best be suited for the required product, and the perfuming Oils and ingredients worked into them. The mass is then slightly moistened if necessary and made up into the required quantity for cakes, and pressed in a dye into the shape desired by means of a strong press.

The cheaper Toilet Soaps are made in the same manner as is directed for making Hard Soaps in the article referred to, but are more or less perfumed with essential Oils or odorous substances.

An infinite variety of Toilet Soaps are supplied by soap makers, and druggists may themselves make them by securing the proper appliances. The perfumes for the soaps depend upon the price at which they are to sell, and may be selected from the formulas already given for bouquets of different kinds, and from the essential Oils suitable for the purpose. Glycerin in small quantities is frequently added to Toilet Soaps, and they are variously colored with harmless ingredients to suit the taste or caprice of the manufacturer.

As so great a variety of Toilet Soaps are required, and so few make them, it would be inexpedient to give formulas for them here.

TOILET VINEGARS.

A class of preparations for the toilet called Aromatic Vinegars have a limited sale. They are chiefly used after bathing and washing the hands and face to impart a freshness to the skin, and for their agreeable odor. The following formulæ will suffice

4364. Aromatic Vinegar.—Glacial Acetic Acid 8 ounces, Cologne Spirit 4 ounces, Camphor, in small pieces, 1 ounce, Oil of Cloves 45 minims, Oil of Rosemary 30 minims, Oil of Bergamot, Oil of Cinnamon, Oil of Lavender, Oil of Pimento, Oil of Neroli, each, 15 minims. Mix, let stand until the ingredients are dissolved, and filter.

4365. Aromatic Vinegar.—This may also be made by mixing any kind of Bulk Perfume with the other ingredients instead of the essential Oils, as: Glacial Acetic Acid 8 ounces, Cologne Spirit 2 ounces, Camphor 1 ounce, Bulk Perfume or Cologne (as desired), 2 ounces. Mix, dissolve and filter.

To use these Vinegars a small quantity is added to a bowl of Water, and usually applied with a soft sponge.

TOILET WATERS.

Toilet Waters as they are known in the market are not as their name would indicate, Waters, but solution of essential Oils or odorous principles in Alcohol or a partly Alcoholic liquid, prepared either by solution or distillation. These are known as Eau de Cologne, Eau de Lavande, Eau de Violette, etc., and have been noticed under Perfumes and other headings. The name is also applied in a general way to perfumed Waters and spirits made by distilling herbs and odorous substances, with Water or a diluted Alcoholic liquid; but as these have been already noticed under other headings, as *Aquæ*, *Spiritus*, etc., further formulæ will be unnecessary.

The foregoing formulas comprise most of the Toilet Preparations and Perfumes that are popular or on the market, and all that it is expedient or desirable for druggists to prepare. If it is intended to engage extensively in the manufacture of perfumes and like articles, many other formulas would be required, for which the reader is referred to comprehensive works on perfumery, soap making, etc.

PART VI.

MISCELLANEOUS FORMULÆ.

The formulæ which follow for miscellaneous preparations, often required in the druggist's business, are, as far as possible, arranged in classes according to their uses. Only a limited number of such formulas can be given in the space which is devoted to this subject, and we have endeavored to select such as are best suited for the purpose.

ADHESIVE PREPARATIONS.

Cements.

These are generally to be applied to the edges of the articles to be mended, previously warmed, and they are then to be held or bound together with twine or otherwise until the cement hardens. The cements have to be warmed also.

4366. Diamond Cement.—Gelatin 1 ounce, Water 5 ounces, Gum Mastic $1\frac{1}{2}$ drachms, Gum Ammoniac $\frac{1}{2}$ drachm, Alcohol $2\frac{1}{2}$ ounces. Dissolve the Gelatin in the Water and continue the heat until the solution has evaporated to about 3 fl.ounces; have the gums previously dissolved in the Alcohol, and to this solution, heated to nearly boiling, add the hot solution of Gelatin, and mix them thoroughly. Put up in small bottles tightly stopped.

This cement may be used for china or glass ware, and for attaching wood, ivory, jewels, metallic substances, etc.

4367. Glutina Cement—*For glass, china, wood, leather, etc.*—Gelatin, Cooper's or Cox's, 3 ounces, Acetic Acid 2 ounces, Carbolic Acid 5 grains, Oil of Cloves 5 minims, Water, enough to make 1 pint. Soak the Gelatin in half a pint of Water for 4 hours, then heat by water-bath in a glass or porcelain vessel, add the Acids, dissolve, add the Oil of Cloves and sufficient hot Water to make a pint, and strain.

4368. Insoluble or Chrome Cement—*For glass and china.*—This cement, which is impervious to hot Water, should be freshly made when wanted for use. Gelatin, in small pieces, 1 drachm, Hot Water $\frac{1}{2}$ ounce,

Bichromate of Potassium 15 grains. Dissolve the Gelatin in the Water contained in a small bottle by means of a water-bath, and while hot add the Bichromate of Potassium and apply as soon as possible, binding the pieces firmly together and setting in the sunlight. The Gelatin and Chrome Salt form an insoluble compound.

4369. Transparent Cement—*For china, glass, etc.*—Mix in a well-stopped bottle 20 parts of Chloroform and 25 parts of native India Rubber, or Caoutchouc, cut in small pieces; when dissolved add 5 parts of Mastic and let the whole macerate for 8 or 10 days, shaking daily, then strain quickly through very thin cotton cloth. This makes a very firm Transparent Cement for china and glass, and may be used for other purposes.

4370. India Rubber Cement or Glue—*For rubber, etc.*—Dissolve Gutta Percha chips or sheet in Bisulphide of Carbon until the solution has the consistence of thick syrup, and strain the mixture with pressure quickly, through a thin cotton cloth. To use this on rubber shave down the edges to be cemented thin, apply the cement freely and warm the parts for a moment, join together and press, clamp or hammer down to hold them firmly until dry.

4371. Aquarium Cement.—Water Lime or Portland Cement, Marble Dust or White Sand, Litharge, each, 4 ounces, Powdered Resin $\frac{1}{2}$ ounce. Mix the powders and make into a putty with boiled Linseed Oil just before using.

4372. Cement for Lamps.—Plaster of Paris wet up with glue Water is generally used, but a more permanent Cement may be made by dissolving 1 ounce of concentrated Lye in 5 ounces of Water, adding 3 ounces of powdered Resin, and boiling them together 5 to 10 minutes. Then to make the Cement, just before using mix Plaster of Paris up with this solution to the proper consistence and apply.

4373. Amber Cement.—To cement or join amber, paint the edges to be united with boiled Linseed Oil, press firmly together and warm for some time at a degree of heat not high enough to melt the amber.

4374. To join Glass to Metal.—To cement glass, porcelain, earthenware or other hard substances to metal, melt a little shellac and join the substances with it while it is melted.

4375. Metal Cement.—An excellent cement for metallic substances may be made by dissolving shellac to saturation in Water glass, by the aid of heat.

4376. Rubber Tire Cement.—A cement for Rubber Tire bicycles and other similar uses may be made by dissolving India Rubber 1 part in sufficient Naphtha, by the aid of gentle heat of water-bath, and when melted adding 2 parts of Shellac, and melting them together, by water-bath, the naphtha is evaporated. Pour the melted mass on metal plates or run in sticks. When used the parts are to be well warmed and the cement heated and applied like sealing wax.

Glues.

Glues are prepared from glue, gelatin, etc., and are used for joining substances like wood, ivory, leather, etc., together, and for many other purposes. Some are prepared in solid form, requiring to be melted before using, and others are made to remain liquid by the addition of various substances. See also Gelatin, page 513, and Liquid Glue, page 514, and Tungstic Glue, page 967.

4377. Glue, Ordinary.—This is prepared by melting Glue in Water by the means of a glue pot or water-bath. It is made of different consistence for various purposes, more or less Water being used as required. It must be applied hot and the surfaces to be joined well bound together until dry.

4378. Liquid Glue.—Glue may be first made liquid by melting in Water as above, and then adding Alcohol 1 ounce to about 3 ounces of Glue, used while still liquid, but most Liquid Glue is prepared with Acid, either Acetic or Nitric as directed, page 514. It may be made of any desired consistence, by using more or less Glue. A little Oil of Sassafras or Cloves is generally used to prevent moulding.

A good Liquid Glue for bottling may be made with good Glue 1 pound, dissolved by means of a water-bath in Water 1 pint in a porcelain vessel, and when dissolved gradually adding 5 ounces Nitric Acid, with constant stirring, or good Glue 5½ ounces, Acetic Acid 5½ ounces, Oil Sassafras 15 drops, Water, enough to make a pint, made in the same manner.

4379. Water-Proof Glue — Marine Glue.—This is prepared by dissolving separately in a sufficient quantity of pure Ether, 3 parts of Shellac and 1 part of India Rubber, and, when dissolved, mixing the solutions and keeping in tightly stopped bottles. This is insoluble either in hot or cold Water, Acids, etc.

Another kind of Glue which will resist moisture, etc., may be made by adding a solution of Sandarach, Mastic and Turpentine Gum, each equal parts in Alcohol 16 parts, to Ordinary Glue or Gelatin melted in Water. The quantity to be used depends upon the purpose for which it is required, about 1 ounce to 2 ounces of Glue in a pint being the proportion for ordinary uses.

4380. Elastic or Mouth Glue.—This is prepared by dissolving good Glue in an equal quantity of Water, and adding to it one half as much Glycerin, and one fourth as much sugar as was used of the Glue. This is run into small pieces and may be moistened and applied to paper or other light substances.

4381. Pad Glue.—This is now extensively used for the backs of pads of paper to fasten the leaves together, and for other similar purposes. Glue ½ pound, Water ½ pint, Acetic Acid 1 ounce, Glycerin 2 ounces, Aniline red, green, blue, or other color as desired, 1 drachm, or sufficient to color. Make the Glue in the usual manner by melting in the Water in a glue pot or water-

bath, and add the Glycerin and coloring matter. This may be made more or less brittle or elastic by varying the quantity of Glycerin.

Mucilages.

Adhesive Mucilages for sticking labels to bottles, tinware, etc., papers together, and for gumming the backs of paper used for stamps, labels, etc., are much used. The following are the various kinds employed for different purposes.

4382. Cascin Mucilage.—Heat sour milk with a little Tartaric Acid, which causes the Casein to separate. Collect and press the mass and while still warm add enough of a solution of Borax 1 ounce in 1 pint of Water to nearly dissolve the Casein. This may be used for the back of label paper and other adhesive purposes.

4383. Label Mucilage.—Soak 6 ounces of Glue in 20 ounces of warm Water, and then dissolve by heat; while warm dissolve in it 3 ounces of granulated Gum Arabic and 8 ounces of Rock Candy. This is for gumming the backs of sheets, for labels, etc., and must be applied, while warm, with a brush.

4384. Stamp Mucilage.—The following is said to be the same as is used for gumming U. S. stamps: Dextrine 2 ounces, Gum Arabic 1 ounce, Acetic Acid $\frac{1}{2}$ ounce, Sugar 1 ounce, Oil of Sassafras 10 drops, Water 6 ounces. Mix and dissolve by heat of water-bath, and apply with a brush while warm.

4385. Good Cheap Mucilage.—This may be made by soaking 1 part White Glue or Gelatin and 2 parts of Gum Arabic in 10 parts of Water, adding $\frac{1}{4}$ part of Sugar, dissolving by gentle heat, straining and adding a few drops of Oil of Cloves to keep.

4386. Dextrine Mucilage.—Dextrine 3 parts, Water 5 parts, dissolve by heat of water-bath.

4387. Mucilage for Tin and Metal.—Most mucilages will not stick on tin or bright surfaced metals, and a mucilage must be specially prepared for this purpose. The following is A 1: Starch 1 pound, Water 1 $\frac{1}{2}$ pint, Muriate of Tin Solution 4 fl.ounces, Glycerin 1 ounce, Oil of Sassafras 30 drops. Mix the Muriate of Tin solution with the Water and Glycerin, and add to the Starch, boil them together until a clear mucilage is formed, and while cooling add the Oil of Sassafras.

Mucilage of Acacia and *Mucilage of Tragacanth*, which are much used for adhesive purposes, are noticed on pages 630 and 632.

Pastes.

Pastes for adhesive purposes are made from flour or starch, and are much cheaper than most mucilages for pasting labels, wrappers,

etc. When druggists are once accustomed to their use they prefer them to mucilage for that purpose, as they dry quicker, keep in place better, and do not wet the paper like mucilage. The following formulas will be sufficient:

4388. Good Flour Paste.—Wheat Flour 4 ounces, Alum, in powder, 90 grains, Oil of Cloves 5 minims, Carbolic Acid 10 grains, Water 1 pint. Mix the flour with enough Water to make a thin mixture, heat the remainder of the Water to boiling, add the Alum to it and then add it quickly to the mixture of flour and Water, stirring them well together, and heating if necessary to make a good smooth paste; while cooling add the Oil of Cloves and Acid.

4389. Good Starch Paste.—This may be made in the same manner as the foregoing, only using starch in place of flour; 1 ounce of Glycerin added is advantageous.

4390. Paste for Tin.—To either of the foregoing formulas, add 1 ounce of Glycerin, $\frac{1}{4}$ ounce of Acetate of Lead, in powder, and $\frac{1}{4}$ ounce solution, Muriate of Tin, to the boiling Water, which is added to the flour or starch.

BAKING POWDER.

In making Baking Powders it is necessary in the first place to choose good and appropriate material, and in the second place to have the articles which enter into the composition dry and very finely powdered. They must then be combined in such proportions that the Acid will exactly unite with the Alkaline base, setting free the Carbonic Acid gas which is united with it, which causes, by its escape through the dough, the lightness of the pastry.

In choosing material to combine in Baking Powders it is necessary to select such substances as will not react upon each other when mixed dry, but which will combine to liberate the Carbonic Acid gas under the influence of moisture and heat. Cream of Tartar, because of its insolubility is the most serviceable of the Acids for this purpose, and Bicarbonate of Sodium, which contains a large quantity of Carbonic Acid gas, readily liberated, when acted upon by an acid, is the best of the Alkaline base.

Owing to the uncertain composition and strength of the material used for making Baking Powders, it is difficult to give definite formulas that will work every time to the entire satisfaction of the operator, for the test of the powder in baking is the only general way by which it may be known if the articles used are balanced so as to be neither alkaline nor acid.

It is also very important that the material used be very finely powdered, thoroughly dry, and perfectly mixed. Baking Powders cannot be thoroughly mixed by hand or in a mortar, because small particles of the bicarbonate of sodium will adhere together, and when used will make small yellow spots or points in the pastry; some kind of a mixer is therefore required that will thoroughly crush these particles and mix all together intimately. Several kinds of mills and mixers are furnished for this purpose. The following formulas will, if properly combined from good material, make excellent Baking Powders, but it should be understood, as previously explained, that the operator should test the powder by baking before sending it out, and if it needs more acid or more alkali, add it until it is properly proportioned to make the best.

4391. Baking Powder, No. 1.—Pure Cream Tartar, 3 pounds, Pure Bicarbonate Soda, $22\frac{1}{2}$ ounces, Best Roller Flour, 1 pound, Corn Starch $\frac{1}{2}$ pound. If preferred, $\frac{1}{2}$ pound Corn Starch and $\frac{1}{2}$ pound Flour may be used in place of 1 pound Flour, in which case the Starch must be finely powdered. Use $1\frac{1}{2}$ teaspoonfuls to 1 quart Flour. This is the best formula.

4392. Baking Powder, No. 2.—Pure Cream Tartar $1\frac{1}{2}$ pounds, Pure Bicarbonate Soda 13 ounces, Tartaric Acid 1 ounce, Best Roller Flour 1 pound, Corn Starch $\frac{1}{2}$ pound. Use 2 teaspoonfuls to 1 quart Flour.

4393. Baking Flour, No. 3.—Pure Cream Tartar 2 pounds, Pure Bicarbonate Soda 1 pound, Roller Flour $1\frac{1}{2}$ pounds, Tartaric Acid 1 ounce, Corn Starch $1\frac{1}{2}$ pounds. Use 2 teaspoonfuls to 1 quart Flour.

4394. Baking Powder, No. 4.—Pure Cream Tartar 1 pound, Pure Bicarbonate Soda 1 pound, Tartaric Acid 3 ounces, Roller Flour 2 pounds, Corn Starch $\frac{1}{2}$ pound. Use 2 teaspoonfuls to 1 quart Flour. This is a good, cheap powder. Keep well covered.

CLOTH CLEANING COMPOUNDS, ETC.

For cleaning cloth, gloves, lace and delicate fabrics that cannot well be washed in the ordinary way many preparations are put up and sold. Most of them are simply, Gasoline or Deodorized Benzine, perfumed with some fragrant oil, but other compounds are also used. Washing compounds are also included under this heading. The following are representative of the various preparations:

4395. Fragrant Benzine or Gasoline.—Gasoline 1 gallon, Oil of Bergamot $\frac{1}{4}$ ounce. Mix them. Any other volatile oil, as Cloves, Cassia, Lavender, Lemon, etc., may be used instead of Bergamot. This may be put up by

any fancy name, and recommended to clean cloth, silks, gloves, etc., and remove grease spots.

4396. Cloth and Glove Cleaner.—Gasoline, or Deoderized Benzine 1 quart, Alcohol, Chloroform, Ether, each, $\frac{1}{2}$ fl.ounce. Mix them. This may be put up and sold at a fancy price for cleaning silks, gloves, etc. It may be perfumed with lavender or cologne if desired.

4397. Clothes Cleaning Compound—*For removing paint, grease, dirt, etc.*—Water of Ammonia 1 pint, Alcohol 9 fl.ounces, Soap Liniment 6 fl.ounces, Borax, in powder, 4 ounces av., Castile Soap, cut or shaved, 4 ounces av., Boiling Water 6 quarts. Dissolve the Soap and Borax in the boiling Water, and when cool add the other ingredients. This is to be applied by rubbing into the grease spot, and then washed out with clear warm water.

4398. Cleaning Cream.—Ivory, or other White Soap 8 ounces, Sal Tartar $\frac{1}{2}$ ounce, Borax 2 ounces, Oil of Sassafras 1 drachm, Water 1 $\frac{1}{2}$ pint. Cut the soap in small pieces and dissolve in the Water by heat of water-bath, add the Borax and Sal Tartar, and while cooling add the Oil of Sassafras, mixing them well together. This removes grease, paint and dirt by rubbing in and washing out with warm water.

4399. Benzin Jelly.—White Soap 12 ounces, Hot Water 18 ounces, Ammonia Water 3 ounces. Dissolve the Soap in the Hot Water, pour in a bottle, and add the Water of Ammonia. Then add to the mixture 2 pints of Gasoline or deodorized Benzin, and shake thoroughly until the mixture is cold and solidified. This is applied by rubbing on the grease spots, and afterwards washing out with warm water.

4400. Erasive Soap.—White Soap 8 ounces, Borax 1 ounce, Sal Tartar 1 drachm, Oil of Sassafras 1 drachm, Water 8 ounces. Cut the soap in shavings and dissolve in the Water by heat of a water-bath, add the Borax and Sal Tartar and boil until reduced to 1 pound, then while cooling add the Oil of Sassafras, and make into cakes of about 2 ounces.

4401. Washing Fluid.—Concentrated Lye, or Caustic Soda, 1 pound, Oil of Turpentine 2 ounces, Borax 2 ounces, Camphor $\frac{1}{2}$ ounce, Soap Bark, ground, $\frac{1}{2}$ pound, Water of Ammonia $\frac{1}{2}$ pint, Water sufficient. Steep the Soap Bark for two hours in $\frac{1}{2}$ gallon of Water, strain and press. Dissolve the Concentrated Lye and Borax in $\frac{1}{2}$ gallon of Water, and add to the decoction of Soap Bark. Dissolve the Camphor in the Oil of Turpentine and add to the solution, then add the Water of Ammonia, and after standing pour off or strain, add a tablespoonful of this to each gallon of Water used for soaking the cloths before washing, and a little in the washing Water.

4402. Washing Fluid.—Sal Soda 4 pounds, Borax 2 ounces, Sal Tartar 1 ounce, Water of Ammonia $\frac{1}{2}$ pint, Spirit of Camphor 2 ounces, Oil of Turpentine 1 ounce, Hot Water 6 pints. Dissolve the Salts in the hot Water and add the liquids. This may be used the same as the foregoing.

4403. Washing Crystal or Powder is prepared by mixing coarsely powdered Borax 8 ounces, with Carbonate of Potash (Sal Tartar) 4 ounces, or Crude Potash 3 ounces. The "1776" and other similar compounds are made by adding excess of Alkali to Soap while making and evaporating to a mass or granular powder. It requires special machinery, and cannot be made except in large factories.

EXTERMINATORS, DESTROYERS AND POISONS.

For exterminating or poisoning rats, mice, bugs, flies and vermin generally, a great many different kinds of preparations are put up and sold. The following represent some of the best for the purpose :

4404. Bed Bug Poison or Exterminator.—Corrosive Sublimate, in powder, 2 ounces av., Alcohol 1 pint. Dissolve the powder in the Alcohol and apply to the bedsteads where the vermin hide.

Another poison for the same purpose may be made with Cyanide of Potassium 2 ounces av., Water 1 pint. Dissolve and apply. These may be used for any kind of bugs, ants or vermin to which it can be applied.

4405. Bug and Ant Poison.—As a poison for cockroaches, other bugs and ants, to eat, the following will give satisfaction. Tartar emetic 1 ounce, powdered Sugar 7 ounces. Mix them intimately together and place the powder where the vermin will find it.

4406. Fly Paper.—Formulas for fly papers, both poison and sticky, will be found on pages 230 and 231. The following additional formula for *Sticky Fly Paper* is given : Common Resin 1 pound, Castor Oil about 5 ounces. Melt the Resin and add sufficient Castor Oil to make it properly adhesive when applied to the paper. As the resins vary, a little less or more than 5 ounces may be needed. Prepare manilla paper or other firm paper by brushing over each sheet with a size made of glue $\frac{3}{4}$ pound, melted in hot Water, 1 gallon. This is applied hot, with a brush, to the paper, and the sheets dried by hanging on lines. The Resin compound is then applied warm, with a brush, to the sized sheets, which are then folded together.

4407. Anti-moth Paper.—Carbolic Acid Camphor, Oil of Cedar, each, 1 part, Benzin 8 parts. Dissolve and dip sheets of heavy porous paper in the liquid and hang on lines until the Benzin evaporates. The paper should then be cut up and kept in tin boxes. These sheets are put away in drawers or with firs, etc., to prevent moths.

4408. Rat Poison.—A great variety of poisons for Rats and vermin are put up under various names, and in various forms. They consist mainly of Arsenic, with the addition of some coloring matter or other substances.

Rough on Rats is an example of proprietary Rat Poisons. It consists of Arsenic colored a little with ivory black or some other black substance. It is mixed with lard and sugar and spread upon bread.

4409. Rat Paste Poison.—This may be made by mixing Arsenic with brown sugar, equal parts, and making into an ointment or paste with lard, the same quantity as is taken of the Arsenic.

Tartar Emetic may be used instead of Arsenic.

4410. Luminous Paste for Rats, Roaches, etc.—This was formerly quite a favorite rat poison, as it shines in the night attracting the attention of the rats, and at the same time acts as a poison. It is best made by melting Phosphorus 1 ounce in Petrolatum or Lard 1 pound, by means of a water-bath, and while melted and well mixed by agitation in a closely stopped wide-mouth bottle, allow to cool and solidify. This may then be mixed with Sugar 1 pound, and Flour 1 pound, or sufficient to make a stiff mass.

A better Luminous paste is made with Arsenic, Luminous paint (made without Turpentine) and Sugar, each, one part, well mixed together.

4411. Mosquito or Black Fly Preventive.—Hunters and fishers who go in the woods during the summer are much annoyed by flies and mosquitoes. The following preparation is for rubbing on the hands and face to keep them off. Petrolatum 3 ounces, Paraffin $\frac{1}{2}$ ounce, Oil Tar 2 ounces, Oil Pennyroyal 1 ounce, Carbolic Acid 2 drachms. Melt the solid ingredients together and when nearly cold enough to begin to solidify incorporate the other ingredients.

4412. To Prevent Flies from lighting on marble or glass.—Put a few drops of Oil of Wintergreen or Pennyroyal on a damp sponge and rub over the surface; they will not light where this is done, but it must be repeated every 4 hours or so.

4413. Other Poisons.—For potato bugs *Paris Green* or *London Purple* seem to be the most successful. The same are also used for coddling moths, and curculio on trees and shrubbery. For lice on plants *Insect Powder* is good, but washing with a spray of *Whale Oil Soap* suds seems to be the most effective. For squash and cucumber bugs, *Calomel* is used.

FOODS.

A few preparations are known as foods for various purposes, as Baby Food, Infant Food, Plant Food, Egg Food, etc. The following are some of the principal popular preparations.

4414. Infants and Invalids Food.—These foods are prepared from various grains in various ways; the object being to secure in them the most valuable constituents of the food, and to present them in the form most

readily digested. To this end the grains are variously treated, by malting, removing some of the less valuable constituents, concentrating, etc. As these processes require expensive machinery and experience, they are not adapted to the uses of druggists, and are, therefore, not given here.

4415. Plant Food.—For making plants grow and blossom, the following are used :

Sulphate of Ammonium 4 ounces, Sal Nitre 2 ounces, Sugar 1 ounce, Hot Water 1 pint. Mix, dissolve and keep in a well-stopped bottle. A little is added to the Water used for plants. Another formula is Nitrate of Potassium 2 parts, Carbonate of Calcium (Precipitated chalk), Chlorate of Sodium, Phosphate of Calcium, each, 1 part, Silicate of Iron 3 parts, Water 20 parts. Mix.

INKS, BLUINGS AND BLACKINGS.

A great variety of Inks, Bluings and Blackings are found on the market. The following formulæ make good preparations of this kind. It must be remembered, however, that there are many qualities of Anilines and other substances used in making inks, etc., which have the same name, but are of different degrees of excellence. The best should always be chosen.

In the limited space only a few formulas can be given, but they will be sufficient.

Inks.

4416. Fine Black Ink Aniline.—Negrosine (Black Aniline crystals), $\frac{3}{4}$ ounce, Dextrin $\frac{1}{2}$ ounce, Corrosive Sublimate 2 grains, Water 2 pints. Dissolve the Negrosine in a pint of hot Water. Dissolve the Dextrin and Corrosive Sublimate in the remaining pint of Water and mix the solutions. This ink flows freely, is always black and does not mold. By using a less quantity of Aniline a very good ink may be made, but is not so black.

4417. Fine Red Ink Aniline.—Eosine Aniline 180 grains, Water 2 pints. Dissolve the Eosine in the Water. This is a bright, brilliant, fiery Red Ink. It is put up and sold as "*Carmine Ink*," but is much better and cheaper than it.

4418. Fine Violet Ink.—**Aniline**—Violet Aniline 120 grains, Alcohol $\frac{1}{2}$ ounce, Dextrin $\frac{1}{2}$ ounce, Hot Water 2 pints. Put the Aniline in a bottle with the Alcohol and add the hot Water in which the Dextrin has been dissolved. Different shades of Violet, ranging from reddish to blue, may be obtained and various shades of ink may be made. The letters B and R signify the proportions of Blue and Red used; the "blue shades" are preferred.

Perfumed Violet Ink was formerly just the thing but has now gone out of fashion. It may be made by adding $\frac{1}{2}$ to 1 drachm of Bulk Perfume to a quart. Other perfumed inks may be made in the same way.

Other Aniline Inks may be prepared in the same manner as the foregoing.

4419. Brown Ink.— $\frac{1}{2}$ ounce Brown Aniline, $\frac{1}{2}$ ounce Dextrin, 1 Quart Hot Water.

4420. Blue Ink.—Water Blue Aniline $1\frac{1}{2}$ drachm, Dextrin $\frac{1}{4}$ ounce, Hot Water 2 pints.

4421. Green Ink.—Green Aniline 2 drachms, Dextrin $\frac{1}{4}$ ounce, Hot Water 2 pints.

4422. Maroon Ink.—Mix equal quantities of Red, Blue and Black Inks.

4423. Purple Ink.—This is made like Violet Ink. It is in fact the same as the bluish violet.

4424. Red Aniline Ink.—This may be made from Red Aniline (Fuch-sine) $\frac{1}{2}$ ounce, Alcohol 2 ounces, Dextrin $\frac{1}{2}$ ounce, Hot Water 2 pints. It is not so good as the Eosine Red Ink. *Scarlet* Aniline Ink may also be made from Scarlet Aniline.

4425. Yellow Ink.—Picric (Carbazotic) Acid 2 drachms, Hot Water 2 pints.

4426. Black Ink, Logwood—School Ink.—Extract of Logwood 3 ounces, Bichromate of Potassium 3 drachms, Hydrochloric Acid 4 fl.drachms, Water 1 gallon. Boil the extract with the Water and Bichromate of Potassium in 1 quart of Water until dissolved, add the Hydrochloric Acid to the balance of the Water, and mix the solutions while warm.

This ink flows nicely and has a good color.

4427. Blue Ink.—Soluble Prussian Blue (Laundry Blue) $\frac{1}{2}$ ounce, Dextrin $\frac{1}{4}$ ounce, Hot Water 1 pint. Mix and dissolve.

4428. Carmine Ink—True.—No. 40 Carmine $\frac{1}{2}$ ounce, Water of Ammonia 1 ounce, Dextrin $\frac{1}{4}$ ounce, Water 1 pint. Rub the Carmine to a powder, then with the Water of Ammonia, then with the Water gradually added, and dissolve the Dextrin in the solution. Red Ink made from Eosine Aniline is much better.

4429. Japan Ink.—This may be made by boiling Borax 3 drachms, Shellac 1 drachm, Sugar 2 drachms, for one hour, in a pint of Water, then straining the solution and dissolving in it $\frac{1}{2}$ ounce Negrosine or Black Aniline. This does not flow as freely as other inks, but is very black and glossy.

Black Gloss Ink may be made from any good Black Ink by adding to it Gum Arabic and Sugar or a strong solution of Shellac and Borax as above. The very finest Japan Ink may be made by dissolving fine India Ink by rub-

bing it with the solution of Shellac as above, made until it is of the proper consistence and color.

Other colored inks may be made gloss inks in the same manner as is here described.

4430. Liquid India Ink.—This is prepared from Stick India Ink by rubbing it down with Water on a plate or other glazed surface until an ink of the proper shade and consistence is obtained. The finest Stick India Ink is prepared from the finest lampblack made into a paste with an infusion of certain native albuminous seeds of China or Japan, and then moulded in sticks. The more common kinds are made up with glue gelatine, etc.

4431. Violet Black Ink—*Violet passing to black.*—Extract of Logwood 3 ounces, Bichromate of Potassium 3 drachms, Alum 2 ounces, Lime Water 1 pint, Water of Ammonia 8 ounces, Commercial Hydrochloric Acid, by weight, 1 pound, Iron filings or old scraps of nails 1 pound, Gum Arabic 3 ounces, Water 1 gallon. Boil the Logwood Extract and the Bichromate of Potassium in one quart of Water until dissolved, add the Alum previously dissolved in 1 quart of hot Water, then add the Lime Water; then the Water of Ammonia; stir thoroughly and gradually add the Hydrochloric Acid with constant stirring, then add the remainder of the Water in which the Gum Arabic is dissolved, and pour the mixture upon the scraps of Iron in an open vessel or crock. Let stand several days and decant.

4432. Writing Fluid.—*Blue-Black.*—Apello Nutgalls, coarsely ground, 1 pound, Sulphate of Iron, copperas, 5 ounces, Gum Arabic 4 ounces, Boric Acid $\frac{1}{2}$ ounce, Extract of Indigo 1 ounce, Picric Acid 1 drachm, Water sufficient to make a gallon. Macerate the Nutgalls in one gallon of Water for 12 hours, then boil in a kettle for one hour and pour off the decoction, add half a gallon of fresh Water to the drugs, and boil again for half an hour and pour off the liquid, press the residue and mix the product with the previous decoction. This will make about 1 gallon of the liquid; to this, while still warm, add the remaining ingredients and dissolve; add Water if necessary to make 1 gallon, and after standing 12 hours or more strain through a coarse muslin strainer. This is a good writing fluid, similar to those most popular in the market.

Many other similar formulas might be given but this will be sufficient. The color may be varied by using more or less Indigo Extract or Picric Acid.

4433. Copying Ink, Black—*For moist sheets.*—By adding a little Gum Arabic and Sugar to most any of the foregoing inks, fair copying inks may be made, but the best copying ink may be made from the writing fluid last given (4431), by adding to each pint 1 ounce of Sugar and $\frac{1}{2}$ ounce Gum Arabic.

An excellent Copying Ink may also be made from the Violet-Black Ink (4430), by adding to each pint $\frac{3}{4}$ ounce each of Sugar and Gum Arabic. This is similar to the popular *French Copying Ink*.

4434. Colored Copying Inks.—Most of the high-colored Aniline Inks make good copies without the addition of other ingredients. If anything is required, however, $\frac{1}{2}$ ounce of Gum Arabic in a pint is usually sufficient, care must be taken not to make the sheets too wet for copying colored inks, as they are apt to blur.

4435. Copying Inks—*For dry paper.*—Inks are sometimes wanted for "Dry Copying" as it is termed. This depends upon the ink altogether, which may be made by adding to any of the regular black or colored writing Inks, from 3 to 4 fl.ounces of Glycerin in each pint, or by making the same inks and using 3 ounces of Glycerin instead of the same quantity of Water in a pint.

The writing is to be quickly done, without blotting and without shading, and the copy taken at once.

4436. Chromograph or Hektograph Inks.—These inks are designed to be used on the Hektograph or copying pad, by which a hundred or more copies or duplicates may be made from one writing.

Black, Blue, Red and Violet may be made in the same manner, but the Violet is most used, because a much larger number of clear copies may be made from it. The formula is as follows: Violet (or other) Aniline $\frac{1}{2}$ ounce av., Alcohol $\frac{1}{2}$ fl.ounce, White Sugar $\frac{1}{4}$ ounce av., Glycerin 1 ounce av., Water 6 fl.ounces. Mix the Aniline with the Alcohol, add the Glycerin. Dissolve the Sugar in the Water and add. Of Black Aniline or Negrosine, double the quantity is required.

4437. Indelible or Marking Ink—*For marking Linen.*—Nitrate of Silver $3\frac{1}{4}$ ounces, Bicarbonate of Sodium $4\frac{1}{2}$ ounces, Stronger Water of Ammonia $3\frac{1}{2}$ ounces, Tartaric Acid $1\frac{1}{8}$ ounce, Archil 1 ounce, Powdered Acacia $2\frac{1}{2}$ ounces, Soluble Sap Gum (or Dextrin) 1 ounce, Sugar $1\frac{1}{2}$ ounces, Water, sufficient to make 20 fl.ounces. Dissolve the Silver and Soda salts, each separately, in two pints of boiling Water and mix the solutions. Allow the precipitate to settle; decant the fluid, and collect the precipitate on a paper filter, wash it with a pint of Water, and, when drained, transfer it to a mortar, add the Acid and mix. When effervescence has ceased add the Stronger Water of Ammonia, and transfer the whole to a bottle containing the Sugar. Now dissolve the Sap Gum or Dextrin in 4 ounces of Water, and the Archil by the aid of heat. Add the Acacia to the mixture, stir until dissolved, and strain. Add the Ammoniacal solution to this, and make up to 20 ounces with Water.

4438. Indelible Laundry Ink.—Carbonate of Sodium (Sal Soda) 1 ounce av., Nitrate of Silver $\frac{1}{2}$ ounce av., Acacia, powdered, $\frac{1}{4}$ ounce av., Water of Ammonia 1 fl.ounce, Distilled Water 4 fl.ounces. Dissolve the Carbonate of Sodium in the Distilled Water and rub with the powdered Acacia in a mortar. Dissolve the Nitrate of Silver in the Water of Ammonia and mix with the mucilage. Transfer to a flask of double the capacity of the liquid, stop

closely, and heat by means of a water-bath to boiling, leaving the stopper loose during the latter part of the operation.

4439. Indelible Ink for Stamp or Stencil.—Negrosine 1 ounce, Tannin 2 drachms, Glycerin 4 ounces, Vanadinate of Ammonium 10 grains. Mix and dissolve. Other colors may be made from other Anilines.

4440. Another.—Asphaltum 1 ounce, Oil of Turpentine 4 ounces, Black Printing Ink 4 ounces, Chloride of Iron $\frac{1}{2}$ ounce. Mix, dissolve and rub them well together.

4441. Marking Ink for Packages and Boxes.—Extract Logwood 1 pound, Bichromate of Potash $1\frac{1}{4}$ ounce, Hydrochloric Acid $1\frac{1}{2}$ ounce, Dextrin 8 ounces, Water 1 gallon. Boil the extract with the Water, add the Bichromate of Potash and the Acid, and lastly the Dextrin. Allow to stand and decant.

4442. Marking Ink for Cotton Bales, etc.—Logwood Extract 1 pound, Copperas 10 ounces, Bichromate of Potash $1\frac{1}{2}$ ounce, Hydrochloric Acid 2 ounces, Brown Sugar 1 pound, Water 1 gallon. Boil the extract with the Water, add the Bichromate of Potash, then the Iron and Acid, and lastly the Sugar. After standing decant.

4443. Marking Inks in Cakes—*For brush or stencil.*—These are made by rubbing some pigment with Dextrin or Gum Arabic in solution and running the solution into boxes or molds. They are the same as water-color paints, and are to be used by wetting their surface with Water and the brush rubbed over them. Make a thick mucilage of Dextrin or Gum Arabic and stir in the pigment to a stiff paste. For *Black*, use drop black or ivory black; for *Blue*, soluble Prussian blue or ultra-marine blue; for *Green*, chrome green; for *Fine Red*, rose pink, scarlet lake, or carmine; for *Cheap Red*, venetian red, red lead, etc.

4444. Stamping Inks for Rubber Stamps.—These are prepared from the Anilines by mixing them with Glycerin, $\frac{1}{4}$ ounce of Aniline to 1 ounce of Glycerin. *Black, blue, green, red, and violet* are the anilines usually used for this purpose. The same inks made in this manner may be used for marking pens. Cheaper inks for rubber stamps may be made with drop black, Prussian blue, chrome green, rose pink, etc., but they are not in general favor.

4445. Ink Powders.—These are prepared for quickly making Inks by the addition of hot Water. They are usually put up in packages sufficient to make a pint of ink, which requires from a teaspoonful to a tablespoonful of the powder. The following are the colors usually desired:

Black, Negrosine in Crystals 1 part, Dextrin 3 parts.

Blue, Water Blue Aniline 1 part, Dextrin 5 parts. This may also be made with soluble Prussian Blue 1 part, Dextrin 2 parts.

Green, Green Aniline 1 part, Dextrin 4 parts.

Red, Eosine Aniline 1 part, Dextrin 1 part.

4446. Ribbon Inks.—Ribbon Inks for type writers, dating stamps, etc., are prepared by saturating thin silk with a solution of some Aniline color in Glycerin or other vehicle. The colors generally used are *Black*, *Dark Green* and *Violet* or *Purple*. The solution may be made by dissolving $\frac{1}{4}$ ounce of the Aniline in a mixture of Alcohol 2 fl.ounces, Water 2 fl.ounces, and Glycerin 4 fl.ounces. The ribbon is saturated with this solution and dried.

4447. Sympathetic Inks.—Sympathetic Inks are those that, when written with, show no writing until something is applied to develop them. They are of no particular use; but the method of making and using is given below.

Black Sympathetic Ink. Write with Tincture of Iron diluted with 10 parts of Water, and develop with a blotter moistened with a solution of Tannin or decoction of Nutgalls, or strong Tea.

This may be reversed by writing with a decoction of Nutgalls and developing with the blotter moistened with Tincture of Iron.

Blue Sympathetic Ink. Write with a solution of Ferrocyanide of Potassium, in 20 parts of hot Water. Develop with a blotter moistened with a solution of Iron.

The operation may also be reversed.

Sympathetic Ink Developed by Heat. Sulphate of Copper and Muriate of Ammonia, equal parts, dissolved in Water.

The writing turns yellow when exposed to heat.

Lemon juice or the mineral acids diluted, solution of Salt, Saltpetre and many other substances, when the writing is exposed to heat, turn yellow or brown.

A weak solution of Chloride of Nickel, mixed with Chloride of Cobalt, turns a beautiful green when exposed to heat.

A weak solution of Cobalt, in Nitro-muriatic Acid, becomes green when the writing is heated, and when cooled again, entirely disappears.

Copper, dissolved in Muriatic Acid and diluted, becomes yellow when the writing is heated, and disappears when cold.

A solution of Acetate of Cobalt, to which a little Nitrate of Cobalt is added, becomes rose color when the writing is heated, and disappears when cold.

4448. Gold and Silver Inks.—Take equal parts of Gold Leaf (or Silver Leaf) and Honey. Triturate them in a mortar until perfectly fine, then add about 30 parts hot Water, and triturate. Allow to settle and pour off the Water. Triturate again with fresh hot Water. Allow to settle and pour off as before. Repeat the washing several times until the Honey is all washed out, then dry the powdered Gold Leaf and mix it with Water and Gum Arabic. It must be shaken occasionally while writing.

Very fine Bronze may be made into Ink by adding Water and Gum Arabic and shaking occasionally while writing.

4449. White Ink.—For writing on black cards and some other purposes, White Ink is sometimes desired. It may be made by rubbing Flake White

6 drachms with Acacia, Mucilage 3 drachms, and enough Water to make 1 fl.ounce. It must be shaken up before using.

4450. Horticultural Inks—*For writing on Metal.*—This ink is prepared for writing on metal tags for labeling plants, trees, etc. Blue Vitriol 1 ounce, Salamoniac $\frac{1}{2}$ ounce, both in powder, dissolve in $\frac{1}{2}$ pint of strong vinegar. This may be used on Zinc or Iron strips or steel; a quill should be used for writing.

4451. Liquid Slating for Blackboards.—Shellac 8 ounces, Lampblack $1\frac{1}{2}$ ounce, Ultramarine Blue $2\frac{1}{2}$ ounces, powdered Rottonstone 4 ounces, powdered Pumice Stone 6 ounces, Alcohol 4 pints. Dissolve the Shellac in the Alcohol, add the other ingredients and mix them well together, apply quickly with a flat varnish brush.

Ink Erasing Fluid.

Fluids for Erasing Ink are somewhat in demand and may readily be made by druggists.

4452. Ink Eraser—*One Preparation.*—Solution of Chlorinated Soda (Labarraque's Solution) 2 parts, Water 1 part. Mix them. This is to be applied, and as soon as the ink disappears the moisture absorbed with clean blotting paper.

Ink Eraser. Two Preparations. No. 1. Hydrochloric Acid 1 ounce, Water 1 gallon. Mix them.

No. 2. Solution of Chlorinated Soda 2 parts, Water 1 part. Mix them. To erase the ink apply No. 1 with the end of the penholder, and then directly apply No. 2, and when the ink has disappeared absorb the moisture with clean blotting paper.

Bluings.

These are made both dry and liquid. The dry Bluings aside from indigo, consist of soluble Prussian Blue, and the liquids are solutions of the same in Water. They may be prepared as follows:

4453. Dry Bluings.—Prussian Blue 4 parts, Oxalic Acid 1 part. Powder the Oxalic Acid and mix them well together. If soluble Prussian Blue is used no acid is necessary. This is put up in various ways for the market.

4454. Liquid Bluings.—Soluble Prussian Blue 1 ounce, Oxalic Acid $\frac{1}{4}$ ounce, Boiling Water 1 quart. Dissolve the salts in the water.

Blackings and Shoe Dressings, etc.

A great variety of Blackings and Shoe Dressings are found in the market good, poor and bad. We have space only to give two or three good formulas.

4455. Shoe Blacking—*French Blacking.*—The paste Shoe Blackings of the market are all made in the same general way, by combining some

elastic substances with oils, driers, black pigments, etc. The difference in them consists mainly in the quality of the materials used and the skill with which they are compounded. The following will make a good blacking. Dissolve India Rubber, cut fine, 2 ounces, in Cotton Seed Oil 1 pound, by the aid of heat, and add to the solution Ivory Black, in very fine powder, 7 pounds, Molasses 5 pounds, Gum Arabic, in powder, 2 ounces, Strong Vinegar 22 fl.ounces. Mix them thoroughly and grind the mixture through a paint mill, then add the Sulphuric Acid $1\frac{1}{2}$ pound, and stir daily for a week or more, or heat gently and incorporate the acid while warm. The use of Sulphuric acid in this blacking is not objectionable as it is neutralized by the lime salts contained in the Ivory or bone black used.

4456. Liquid Paste Blacking.—A liquid Blacking may be made by melting the above and mixing it with good vinegar, say three gallons for the above quantity. This is not like the popular Shoe Dressings on the market.

4457. Shoe Dressing.—Shellac, dark colored, $1\frac{1}{2}$ pound av., Sal Soda, crystals, $6\frac{1}{2}$ ounces av., Gum Arabic 4 ounces av., Negrosine (Black Aniline) $\frac{3}{4}$ ounce av., Water sufficient to make 1 gallon. Put the Sal Soda in half a gallon of Water and heat to boiling, add the Shellac to the boiling solution and continue the heat for 10 or 15 minutes until all the Shellac has dissolved that will (there will be a small portion undissolved), then add the Negrosine and a pint of Water in which the Gum Arabic has previously been dissolved. When cool, strain and add enough Water to make 1 gallon.

This is similar to most of the "patent" Shoe Dressings on the market. It may be made to dry more quickly by adding a little Alcohol.

4458. Bronze Shoe Dressing.—Add to the foregoing $\frac{1}{2}$ to $\frac{3}{4}$ ounce of Red Aniline in a gallon, and dissolve by gentle heat. Some other colored anilines will also make a bronze finish.

4459. Patent Leather Dressing.—This is designed to give a finish like patent leather, and is waterproof. It may also be used as a *Belt Polish*, and for all similar purposes. India Rubber $\frac{1}{4}$ ounce, Shellac 4 ounces, Camphor $\frac{1}{2}$ ounce, Negrosine $\frac{1}{2}$ ounce, Wood Alcohol 12 fl.ounces. Dissolve the rubber by heat of water-bath in the Wood Alcohol, then add the other ingredients and dissolve.

4460. Bronzing Liquid.—Red Aniline 1 ounce, Violet or Purple Aniline $\frac{1}{2}$ ounce, Alcohol 10 ounces, Benzoic Acid $\frac{1}{2}$ ounce. Dissolve the Anilines in the Alcohol by aid of water-bath, then add the Benzoic Acid and boil 5 or 10 minutes, or until the greenish color of the preparation is changed to a light colored bronze. Apply with a brush or sponge.

This may be added to the shoe dressing.

4461. Government Harness Dressing.—Neatsfoot Oil 1 gallon, Bayberry Tallow 2 pounds, Beeswax 2 pounds, Beef Tallow 2 pounds, Castor Oil $\frac{1}{2}$ gallon, Lampblack 1 ounce. Melt together the Wax and Tallow, and add the Oils and Lampblack. When thoroughly mixed, strain through muslin.

4462. Waterproof Blacking.—For greasing boots, making them Waterproof, etc. Neatsfoot Oil 1 gallon, Beeswax 2 pounds, Shellac $\frac{1}{2}$ pound, Beef Tallow 8 pounds, Castor Oil 1 quart, Lampblack $\frac{1}{4}$ pound. Melt and mix them as the preceding.

4463. Harness Polish.—Glue 4 ounces, Vinegar $1\frac{1}{2}$ pint, Gum Arabic 2 ounces, Black Logwood Ink $\frac{1}{2}$ pint. Dissolve the Glue in the Vinegar by heat of water-bath, dissolve the Gum Arabic in the Ink. Mix the solutions while warm. This makes a jelly which should be dissolved by gentle heat when wanted to use. By adding to this $\frac{1}{2}$ ounce Nitric Acid it makes a liquid which is always ready for use.

The Shoe Dressing (4457) may also be used for Harness Polish.

4464. Hectograph Copying Pad.—Hectograph Copying Pads should be made somewhat softer for winter use than for summer, which can be done by adding a little larger proportion of Glycerin. Good Glue 4 ounces av., Glycerin 16 ounces av., Water 8 fl.ounces. Break up the Glue and soak in the Water for a few hours, then heat by water-bath until melted, and add the Glycerin and heat together for some time to evaporate part of the Water, then strain into a shallow square tin to make the desired shape, and skim with a card to free from bubbles. This is improved by adding 1 ounce carbonate of barium to the liquid while warm.

The writing to be copied is done with Hectograph Ink (4436) and transferred to the pad, sheets of paper are then put on and copies made.

4465. Carbon Duplicating Paper.—Lard 10 ounces, Beeswax 2 ounces, Canada Balsam $1\frac{1}{2}$ drachm, Lampblack sufficient. Melt the Lard, Wax and Balsam together and add enough Lampblack to make of the desired color. This is applied to firm thin paper with a flannel dauber and wiped off with clean rags.

POLISHING PREPARATIONS.

Among the preparations put up and sold by druggists and others connected with the business are a great variety of Polishes of different kinds, and for various uses. The following are the formulas for the more important ones :

Furniture Polish.

For restoring the color or luster of furniture, preparations are designed to be applied with a cloth, and rubbed until dry.

4466. Furniture Cream.—Common White Soap 150 grains, Sal Tartar 60 grains, White Wax $2\frac{1}{2}$ ounces, Water 5 fl.ounces, Oil of Turpentine 10 fl.ounces. Melt the Soap in the Water by the heat of water-bath, add the Sal Tartar and then the White Wax. When the Wax is melted, remove from the fire and slowly add, with constant stirring, the Oil of Turpentine,

mixing them thoroughly while cooling. This is to be applied with a cloth and rubbed down with Canton flannel.

4467. Furniture Polish.—Linseed Oil 6 fl.ounces, Alcohol 3 fl.ounces, Shellac 1 ounce av., "Butter" of Antimony $1\frac{1}{2}$ fl.ounces, Hydrochloric Acid $\frac{1}{2}$ ounce, Oil of Turpentine 5 fl.ounces. Dissolve the Shellac in the Alcohol, and mix with the Linseed Oil and Turpentine, then, having mixed the Hydrochloric Acid and "Butter" of Antimony, add them to the preparation and mix thoroughly. Apply as the preceding.

Glass Polish.

For polishing glass, mirrors and bright ware, as silver-plated ware, etc., the following are recommended :

4468. Glass and Silver Polish.—Prepared Chalk 3 ounces av., Alcohol, Water of Ammonia and Water, each, 3 fl.ounces. Mix them by rubbing the Chalk to a smooth paste with the liquids.

4469. Glass Polish.—Calcined Magnesia mixed with Gasoline into a liquid of the consistence of cream is excellent for polishing plate glass, mirrors, etc. Calcined Magnesia made up into balls with powdered soap is also a good preparation for this purpose.

Silver Polishes.

The following are recommended for polishing silver and nickel-plated ware, etc. They make fine polishes that will not scratch.

4470. Silver Polishing Liquid.—Prepared Chalk 1 pound, Crocus Martis 4 ounces. Mix well together and, to make up, put 1 ounce of the mixture in a 4 ounce bottle, add 1 ounce of Water of Ammonia and Water enough to fill the bottle. Shake before using and apply with a cloth, then rub off when dry with another cloth.

4471. Silver Polish Powder.—Rouge or fine Crocus Martis 1 ounce, Fossil Silica 4 ounces, Prepared Chalk 1 pound. Rub the Fossil Silica to a fine powder and mix intimately with the Chalk. This will not scratch the finest surface. A cheaper powder may be made with whiting and rotten stone, or by using Prepared Chalk alone.

4472. Silvering Solution or Polish.—Cyanide of Potassium 2 ounces, Nitrate of Silver 1 ounce, or a sufficient quantity, Distilled Water 12 ounces, Precipitated Chalk 2 ounces. Dissolve the Cyanide of Potassium in the Water and add to it a concentrated solution of Nitrate of Silver as long as the precipitate first formed is redissolved, then add the chalk, and mix them thoroughly. This serves as a plating and polish for silver.

4473. Gilding Solution.—This is made in the same manner as the foregoing, only Chloride of Gold and Sodium is used instead of Nitrate of Silver.

Polishes for Brass and Metal.

The foregoing polishes may also be used on brass and metals, but do not "take hold" like the following :

4474. Polishing or Pultz Pomade.—Subcarbonate of Iron 6 ounces, Fossil Silica 2 ounces, Petrolatum 1 pound, Cotton Seed Oil 2 ounces, Oil of Mirbane, or Essential Oil of Almonds 40 minims. Reduce the Fossil Silica to a very fine powder and mix it with the Iron, melt the Petrolatum, add the Cotton Seed Oil and stir in the powders, run through a sieve, and while cooling add the flavoring Oil and stir until ready to set, then run into boxes.

Instead of Fossil Silica, Prepared Chalk or Whiting may be used.

This is applied with a rag and well rubbed, then wiped off with a clean cloth and the surface polished with a little whiting if necessary.

4475. Polishing Liquid—*For Brass, Copper, etc.*—Oxalic Acid 1 ounce, Crocus Martis 2 ounces, Whiting 4 ounces, Water 1 pint. Mix. Shake before using, apply with rubbing and polish dry with Whiting. The same substances may also be used dry, or applied with a little Oil with rubbing and rubbed dry with whiting.

4476. For Polishing Tin.—Mix Oxide of Tin 1 part with Whiting 3 parts, and polish by rubbing with the powder.

4477. Tripoli.—This is a gritty, polishing substance made by calcining flint and reducing to a powder; ordinary *Water Lime* is used for the same purpose. They are not intended for fine, highly-polished surfaces, but for brightening and scouring.

4478. Stove Blacking or Polish.—Stovg Blacking as it is known in the market is simply Blacklead, Amorphous Graphite or Plumbago, variously prepared and moulded, pressed, or cut into shape. It is obtained from mines, and consists of Carbon mixed with Iron, the mixture often being called Carbide or Carburet of Iron. It is finely ground, made into a stiff paste, moulded into bricks or other convenient form and dried. It is also furnished in the form of paste run into boxes.

Laundry Polish.

For giving a gloss to linen, preparations are put up in the form of liquids, also in cakes of wax. They are mixed with the starch when made, and the polish is secured by ironing with a rounding polishing iron.

4479. Laundry Wax or Polish—*Starch Gloss.*—White Wax, Paraffin, Spermaceti, Stearin, powdered Gum Arabic, of each equal parts, melt the waxes, and while cooling stir in the powdered Gum Arabic and run in molds. Two drachms of this wax boiled with a pint of starch and thoroughly

mixed with it is the proper proportion for polishing, half the quantity suffices for ordinary finishing.

Paraffin alone is used for the same purpose.

4480. Liquid Starch Glace.—White Wax 1 ounce, Spermaceti 1 ounce, Gum Arabic 1 ounce, Borax 1 ounce, Water 10 ounces, Oil of Cloves 10 drops. Dissolve the Borax and Gum Arabic in the Water, melt the Wax and Spermaceti and while liquid rub with the solution of Borax, etc., to make an emulsion, mixing them thoroughly. A tablespoonful or two of this liquid in a pint of starch gives a fine polish. It may also be applied after starching by rubbing over the starch with a cloth, and then polishing with the iron.

PRESERVATIVES.

For preserving fruit, fruit juices, foods, etc., several preparations are put up and sold in various forms. The following are representations.

4481. Cider Keeper.—For keeping Cider and other fruit juices Salicylic Acid has been proven to be the best. It may be put up in packages of $\frac{3}{4}$ ounce each, which is sufficient to keep a barrel (45 gallons) of Cider. It is to be added when the Cider is "just right," and should be mixed with a gallon of Cider before adding to the remainder, and then thoroughly mixed with the whole.

For keeping wines, etc., it should not be added until after fermentation has ceased.

4482. Cider Preservative.—Sulphite of Lime is used for this purpose with good effect. Four ounces in a barrel of Cider is the required quantity, mixed in the same manner as above described.

4483. Fruit Juice Preservative.—To preserve Fruit Juices in their natural condition without the aid of heat, add to each gallon of the freshly pressed juice 20 fl.ounces of Cologne Spirit in which 40 grains of Salicylic Acid have been dissolved, and set away, tightly stopped, in a cool place. Treated in this manner Fruit Juices will not spoil, ferment or mould.

4484. Fruit Preserving Liquids.—A saturated solution of Hyposulphite of Sodium may be used for preserving fruit, in the proportion of a tablespoonful to a quart of fruit. It imparts a bitterish, saline taste.

A solution of Salicylic Acid 1 ounce, in Alcohol 1 pint, may be used for the same purpose, a tablespoonful being used with a quart of fruit and the ordinary quantity of sugar.

4485. Egg Preservatives.—Eggs may be preserved by dipping them in melted paraffin or by rubbing them over with Petrolatum, with which a little

Salicylic Acid, say $\frac{1}{2}$ per cent., has been mixed. They should be rubbed over twice with this.

They may also be preserved by soaking in the saturated solution of Hypo-sulphite of Sodium as above, or in a strong solution of Salicylic Acid in Alcohol.

4486. For Preserving Specimens.—For specimens to be preserved in anatomical jars, Diluted Alcohol is the best preservative. The substance should be suspended from the hook or by a cord, and covered with Diluted Alcohol.

4487. For Preserving Organic Substances.—*Wickersheim's Process.*

	FOR INJECTING.	FOR STEEPING.
Arsenious Acid,	16 grammes.	12 grammes.
Sodium Chloride,	80 grammes.	60 grammes.
Potassium Sulphate,	200 grammes.	150 grammes.
Potassium Nitrate,	25 grammes.	18 grammes.
Potassium Carbonate,	20 grammes.	15 grammes.
Water,	10 liters.	10 liters.
Glycerin,	4 liters.	4 liters.
Methylic Alcohol,	$\frac{3}{4}$ liter.	$\frac{1}{2}$ liter.

The solid substances are boiled in the Glycerin and Water, and the Alcohol added when cool. These liquids are used for preserving dead bodies, embalming, etc.

WINES AND SPIRITOUS LIQUORS.

Wines and Spiritous Liquors form quite a large portion of the articles used and sold by druggists. In this article it is impossible to give anything but a brief outline of their manufacture, but our work seems incomplete without such reference. The following processes, formulæ, etc., are therefore given. They have also been referred to in the articles: Alcohol, page 86, Wines, page 997, and Spirits, page 767, 771.

Wines.

Natural and artificial Wines are found in the market in great variety; both kinds will be considered in this article.

4488. Pure Wines are, or should be, made by the fermentation of Grape juice, by which their saccharine matter is converted into Alcohol or Spirit, which, if in sufficient quantity, prevents the Wine from deliterious change; but if insufficient, is still further oxidized, being converted first into an aldehyd and then into acetic acid or vinegar. With light grape juices it is often necessary to add cane-sugar previous to or during fermentation, that a larger

proportion of Alcohol may be produced by its decomposition, or to add a small percentage of Cologne Spirit to the Wine after the fermentation is completed, and before the acetic change has begun, and should be three years old before they are offered for use.

In making Wines the cask or package in which they are made should be kept filled, by adding a little from time to time as the pumice and foam works off through the open bung at the top. When the fermentation is completed, they should be tightly bunged and put aside in a cool place, and after standing a few months "racked off" into another clean cask, rejecting the sediment at the bottom.

4489. White Wines.—These are made from many varieties of grapes by pressing out their juice, fermenting and treating as already described. These Wines are known by various names derived from the variety of grapes from which they are obtained, the locality where they are produced, etc. In medicine, imported Sherry is preferred, as it contains a larger percentage of Alcohol than other varieties. Our own native Wines are also much used, California Wines, Angelica Sherry and Muscatel, being of good body and flavor, and Catawba Wine made in the East, are much esteemed.

4490. Red Wines.—Most of the Red Wines are made by fermenting the juice of red grapes in presence of their skins and pulp. Unlike the White Wines the juice is not pressed out until the fermentation has proceeded for some time. This process secures the red color and the astringent qualities which the Red Wines usually possess. The favorite medicinal Red Wine is the Oporto or Port; but similar Wines made in this country from various varieties of red grapes are much used.

4491. Improvement of Wines.—It has been found by experiment that the quality of Wines may be improved and the quantity much increased in various ways.

Chaptal's process consists in the addition of sugar to the expressed juice before fermentation, which being decomposed increases the Alcoholic strength. Marble dust is then added to neutralize the excess of acid.

Dr. Gall's method is to prepare a normal must or juice mixed with an equal quantity of Water, containing 0.5 to 0.6 per cent. of free acid and 22 to 24 per cent. of sugar, which is treated in the same manner as true grape juice.

Petiot's method for improving and increasing the quantity of Wine, consists of adding to the expressed juice an equal volume of Water containing the same proportion of sugar as is contained in the natural juice. Then to the pulp of the grapes adding a like quantity of Water sweetened in the same proportion and allowing to ferment for three days. Then pouring off and again adding the same quantity of sweetened Water to the same pulp and allowing to ferment as before, and finally mixing the liquids all together, thus making four times as much Wine as there was grape juice to start with, and, it is claimed, equal in all respects to pure grape juice Wine. Wines

made in this manner have the true bouquet of pure Wines, are not subject to disease like pure Wines, and mature in a few months instead of two or three years as is required for natural wines.

Glycerin and Salicylic Acid are often added to Wines to preserve them. To preserve light Wines (deficient in Alcohol), they are heated to 124° F. and put up at once in bottles or casks, and closely sealed; this process was introduced by Pasteur.

Artificial Wines.

Besides the process of improving and diluting Wines above described, a great deal of Wine entirely fictitious is found in the market. A few formulas only can be given, and they are given as suggestions rather than formulas, for each kind of Wine requires some special treatment peculiar to itself.

4492. Artificial White Wine.—As a base for any of the Artificial White Wines the following may be used: Grape Sugar 25 pounds, Tartaric Acid $\frac{1}{2}$ pound, Hot Water 6 gallons, Cold Water 19 gallons, Grape pulp, fresh, 50 pounds (or common raisins 30 pounds). Dissolve the Sugar and Acid in the hot Water and add the cold Water, add this to the Grape pulp or to the raisins, chopped fine, stir well together and allow to ferment 4 or 5 days, stirring occasionally, then press and transfer the liquid to a barrel in the cellar and treat in the same manner as other Wine. If necessary after fermentation Cologne Spirit may be added to make up the alcoholic percentage required.

The Grape pulp or raisins used will give the desired flavor to the Wine, according to the kind used, but if a more distinctive flavor is desired, the artificial flavors or oils made for the purpose from Ethers may be used as directed. In this manner Angelica, Muscatel, Catawba, Rhine Wine, Sherry and other varieties may be made. *Champagne* is artificially prepared from white wine by charging it with carbonic acid gas, and bottling.

4493. Artificial Red Wines.—As a general base for Artificial Red Wine the foregoing formula may be used with the addition of astringents, coloring substances and flavoring. The substances used for coloring are juices of fruits, as raspberry, cherry, elderberry, pokeberry, whortleberry, etc., or decoctions of Cochineal, Brazil wood, logwood, etc.; the former are greatly to be preferred; Prunes are also frequently added. The flavorings are made from combinations of ethers, etc. The astringent substances added are, Catechu, Kino, Oak-bark, Tincture of Galls, etc., about 1 ounce of Catechu or Kino being used for 10 gallons of Port Wine and two or three times the quantity for Clarets. Much less sugar also is required in the Bordeaux or Claret Wines.

4494. Wine Essences or Extracts.—The true flavor of Wines can only be obtained in a concentrated form by distilling the Wines or the lees from which the juices are pressed, and separating their flavoring or oils by various

treatment. These oils or essences or flavors, are ethers, which result from the oxidation of Alcohol radicals, chiefly of the Amyl and Ethyl series, and they may be artificially produced by combining various Ethers, obtained by the oxidation of fousel oil, potato oil, etc. Their production and combination, however, is still experimental and uncertain, and it cannot be said that the true flavor of any particular kind of Wine has been produced artificially, although close imitations have been arrived at, and manufacturers claim to furnish Wine essences or flavors of various kinds. They are at best, however, but poor imitations, and their formulas had better be deferred until they have been more definitely determined than at present.

Spirits or Spiritous Liquors.

Spiritous Liquors are prepared from saccharine or starchy liquids by fermentation and subsequent distillation of the more volatile portions which result from the decomposition of the sugar or its change into alcohol. Fruit and other juices, grains of various kinds, or any substances which contain sugar or starch in abundance, may be used for making spirits. In this country *Brandy*, distilled from Wines or fermented grapes, apples, etc., *Rum*, distilled from fermented molasses, or sugar cane juice, and *Whisky* and *Gin*, distilled from fermented grains or other substances containing starch, are the chief liquors used ; but in other countries other liquors containing alcohol are made from various substances, as rice, the juice of cactus, potatoes, etc.

The general process of making Spiritous Liquors is briefly described under *Alcohol*, page 87. For the special processes and treatment of various substances for the production of Spirits or Alcohol our readers are referred to standard works upon that subject. The following brief suggestions may be of interest :

4495. Brandy.—Brandy is distilled from fermented grape juice or the fermented pulp and juice of grapes ; the best varieties being known as *Cognac*, obtained from the South of Europe ; good brandy is also made in this country. A brandy is also obtained from cider, which is familiarly known as "Apple Jack."

Brandy contains from 40 to 60 per cent. of Alcohol, the varieties generally sold being about 50 per cent. or 100° proof.

4496. Artificial Brandy.—The high price of Brandy makes its artificial production quite desirable, and fictitious brandy is much more frequently found in the market than genuine. The simplest way to make Artificial Brandy is to dilute Cologne Spirit 190° proof, with an equal volume of pure Water, adding to each gallon about 5 grains of Tannic Acid, 3 drops Oil of Cognac, 3 drops of Ceanthic Ether, and sufficient burnt sugar coloring to

give it the desired color. This may be improved by adding 1 fl.drachm Extract of Orris and 5 drops Essence of Almond to a gallon. One ounce of Syrup is sometimes added.

This may also be prepared from the Brandy Essence and proof Spirit, or diluted Cologne Spirit, as directed below.

4497. Brandy Essence.—A flavoring for Brandy may be prepared ready for use as follows: Oil of Cognac, fine, 1 ounce, Ceanthie Ether, commercial, 1 ounce, Oil of Bitter Almond 2 fl.drachms, Orris Root, in powder, 16 ounces, Tannin 2 ounces, Cologne Spirit, sufficient to make 1 gallon. Macerate the Orris Root in the Spirit for one week and percolate until 1 gallon is obtained; to this add the Tannin, dissolve and filter, and then dissolve the Oils and Ether in the filtrate. Half a pint of this Essence is sufficient for 40 gallons of Brandy (1 ounce for 5 gallons), added to colored proof Spirit. The true Oil of Cognac is very expensive, but upon this depends the fine flavor of the brandy.

4498. Rum.—Rum is distilled from fermented molasses or from the fermented juice of the sugar-cane. *New England Rum* is distilled from molasses, but *St. Croix* or *Santa Cruz* and *Jamaica Rum*, made in the West Indies, are distilled from the juice and fragments of sugar-cane and the refuse of sugar factories. The juice and slices of pine apples and other tropical fruit are usually added to the distilled rum or mixed with the fermented liquid before distillation. Jamaica Rum is the most esteemed of any.

As found on the market the different kinds of Rum are about 100° proof, but Jamaica Rum as imported contains from 60 to 75 per cent. of Alcohol. Much of the Rum found on the market is artificially prepared after the manner described below.

4499. Artificial N. E. Rum.—Cologne Spirit 190° proof, pure Water, each, 10 gallons, Butyric Ether 2 ounces, Acetic Ether 2 fl.drachms, Extract Orris 2 fl.drachms, Syrup 1 quart. Mix them.

4500. Artificial Jamaica Rum.—To imitate Jamaica Rum best, a portion (from $\frac{1}{2}$ to $\frac{1}{3}$) of imported Jamaica Rum should be used, diluted to proof with Cologne Spirit and Water, and flavored with a little Essence of Jamaica Rum, about 1 ounce to 10 gallons of the finished product. A very good imitation may, however, be made as follows: Cologne Spirit 190° proof 10 gallons, Water 10 gallons, Essence Jamaica Rum 3 ounces, Tincture Catechu 2 ounces, Brown coloring (caramel), sufficient. Mix them.

4501. Artificial Santa Cruz Rum.—This may best be made by mixing 1 gallon of Genuine Santa Cruz Rum with 7 gallons New England Rum, and adding 1 ounce of Jamaica Rum Essence.

4502. Imitation Arrack.—To 12 gallons of New England or Santa Cruz Rum add 1 ounce of Benzoin and 1 ounce of Tolu, and 1 sliced pine apple, macerate for two weeks and filter through a little Magnesium Carb. The Benzoin and Tolu are best dissolved as much as possible in a pint of Cologne Spirit before adding.

4503. Jamaica Rum Essence.—Butyric Ether 15 fl.ounces, Acetic Ether 2 fl.ounces, Tincture of Vanilla, Alcoholic, 2 fl.ounces, Extract of Orris 2 fl.ounces, Cologne Spirit 3 ounces. Mix them.

4504. Whisky.—This is by far the most familiar and most used spiritous liquor of this country. Our distillers are famed for the production of fine brands of Whisky, which, like the wines of certain houses of Europe, have their reputation at home and abroad. The production of fine whiskies is a trade secret with their manufacturers, all being similar in composition and alcoholic strength but differing sufficiently in flavor to make them distinctive and different to experts. Whiskies are made by combining various grains with rye or barley malt, etc., in varying proportions, grinding, fermenting, treating in various ways, distilling, etc.; but the limits of this article does not admit even of a description of the processes employed only in a general way. (See page 87.) In the manufacture of fine whiskies from 8 to 10 quarts only are distilled from each bushel of grain used; but in making the cheaper grades of whisky, by improved process, from 13 to 20 quarts are distilled from the mash for each bushel of grain used. Whisky improves by age and is not suitable for use until it is at least 2 years old. Various treatments for "Aging" Whisky by agitation and otherwise are employed.

4505. Artificial Whisky.—Owing to the moderately low price of good Whisky as compared with Spirits but a small proportion of the amount sold is made up from Cologne or Neutral Spirit direct; but by mixing different grades of Whisky, or by mixing good high flavored Whisky with proof Spirit, a great variety of cheap and moderate-priced whiskies are produced. Nor is this alone the reason for mixing whiskies, for by combining some of the best grades with each other "blends" are produced which surpass in flavor those of which they are composed when taken alone. A variety of flavoring essences or oils are also made for flavoring whiskies, but they are little used except by rectifiers.

These oils or essences are combinations of Amyl and Ethyl Ethers as before described and have no standard of composition, different manufacturers furnishing entirely different flavors under the same name.

A general formula for Whisky made from spirits is as follows: Cologne Spirit, 190° proof, 20 gallons, pure Water 20 gallons, good, high flavored Bourbon or Rye Whisky 10 gallons. Mix and color with burnt sugar (Caramel). For Wheat Whisky leave uncolored. This makes a good cheap Whisky without any objectionable features. If too expensive for the use desired, on account of the addition of the good Whisky, 8 ounces of any of the following essences may be used instead. The proof may also be reduced by adding more Water, and by the addition of 2 ounces of the beading oil it will still "hold its bead."

4506. Bourbon Whisky Essence.—Rectified Fousel Oil 1 ounce, Acetate of Amyl 4 ounces, Pelargonic Ether 2 ounces, Extract of Orris 4 ounces, Oil of Wintergreen 1 ounce, Acetic Ether 1 ounce, Cologne Spirit 12 fl.ounces. Mix them. Use 1 ounce for flavoring 5 gallons.

4507. Rye Whisky Essence.—Butyric Ether 1 ounce, Rectified Fousil Oil 1 ounce, Butyrate of Amyl 1 ounce, Acetic Ether 2 ounces, Extract of Orris 4 ounces, Extract of Vanilla 1 ounce, Extract of Musk Root 4 ounces, Cologne Spirit 12 fl.ounces. Mix them. Use 1 ounce for flavoring 5 gallons.

4508. Scotch and Irish Whisky.—These have a smoky flavor, which may be imitated by adding Soot, or by adding a drachm of Creasote dissolved in an ounce of Acetic Acid to a barrel of ordinary Whisky. Many other varieties of Whisky are known; as *Malt Whisky*, *Monongahela Whisky*, and an infinite number of private brands of manufacturers which have become popular.

4509. Bead or Beading Oil.—For low proof liquors an artificial bead is required. It is made by rubbing 1 ounce of the finest Olive or Almond Oil with 1 ounce of Sulphuric Acid in a mortar, gradually added, and when entirely combined adding sufficient Cologne Spirit to dissolve it, about 20 ounces being necessary. Two or three ounces of this is used in a barrel.

This Beading Oil is used for all kinds of spiritous liquors. The same effect may be secured by filtering through starch or wheat bran.

4510. Rye and Rock.—Good Rye Whisky 6 pints, Water 1 pint, Rock Candy 2 pounds. Dissolve the Rock Candy by heating with the Water; then add the Whisky and filter. The Whisky and Water may also be mixed and the Rock Candy dissolved in the mixture cold, but it is much more expeditious to dissolve the Rock Candy first in the Water by heat.

4511. Tolu, Rock and Rye.—Tincture Tolu 2 ounces, Carbonate of Magnesium $\frac{1}{2}$ ounce, Good Rye Whisky 6 pints, Water 1 pint, Rock Candy 2 pounds. Rub the Magnesium to a fine powder and add the Tincture Tolu; triturate and gradually add 8 ounces of the Whisky, rubbing it thoroughly together. Dissolve the Rock Candy by heating with the Water and add the Whisky, then mix all together, allow it to stand 24 hours, and filter clear. This is a much used and very good stimulating cough preparation.

Dose, tablespoonful or more, as required

4512. Tolu, Rock, Rye and Redroot.—Fluid Extract Bloodroot $\frac{1}{4}$ ounce, Tolu, Rock and Rye 1 gallon. Mix and after standing 48 hours filter. The addition of the Bloodroot to the Tolu, Rock and Rye makes a fine preparation for bronchial difficulties, coughs, colds, etc.

4513. Gin.—Aside from Whisky, Gin is the most used of any of the Alcoholic liquors. The spirit from which genuine Gin is made is distilled from grain and malt the same as Whisky, and after being properly purified by rectification it is redistilled with Juniper berries and some aromatics, or the aromatics are added afterward. Like Whisky, the old distillers of Gin have their trade secrets and make favorite brands which have become well known. Good Gin is made in this country, but Holland has the reputation of producing the best in the world. In distilling Gin, from 5 to 10 pounds of

Juniper berries are used for 100 gallons, and the aromatics are proportioned according to the variety desired to be made.

As Gin is a compound liquor, it cannot be classed as *artificially* made like other liquors, the only difference in the distilled and the prepared Gins being the use of Juniper berries and aromatic substances, instead of the oils or essences of the same.

Instead of the distilled Gin as above described the following may be used, and will give very good results :

4514. Holland Gin.—Cologne Spirit 190° proof 20 gallons, pure Water 20 gallons, Oil Juniper berries 2¼ fl.ounces, Oil of Lemon 20 drops, Oil of Coriander 15 drops, Oil Bitter Almonds 5 drops, Oil Cassia 5 drops, Oil Fennel 5 drops, Syrup of Acacia 1 gallon. Dissolve the Oils in a gallon of the Spirits, and having mixed the remainder of the Spirit with the Water, add the solution to it, then add the Syrup Acacia and mix them well together by agitation. After standing for some time draw off and filter clear through the filtering mixture (see below).

4515. London Cordial Gin.—Cologne Spirit 20 gallons, Pure Water 20 gallons, Oil Juniper Berries 2¼ ounces, Oil Calamus 20 drops, Oil Angelica 10 drops, Oil Coriander 5 drops, Oil Cassia 5 drops, Oil Bitter Almond 5 drops, Syrup Gum Acacia 2 gallons. Dissolve the oils in 1 gallon of the spirits, and having mixed the remainder with the water, add the solution and then the Syrup of Gum Arabic, mix them well together and after standing filter clear.

4516. Schiedam Schnapps.—Make a tincture or extract by percolating Gentian, Bitter Orange peel, Agaric, Galangal, Centaury, each, 4 ounces, all in coarse powder, with diluted Cologne Spirit sufficient to make 1 gallon. Add 1 ounce of this extract to a gallon of the Holland or London Cordial Gin as above.

4517. Old Tom Gin.—Oil Coriander 1 drachm, Oil Cedar 1 drachm, Oil of Fennel ½ drachm, Oil Bitter Almonds 15 drops, Oil Angelica 30 drops, Oil Juniper Berries ½ ounce, Syrup Acacia 1 gallon, Cologne Spirit, 190° proof, 20 gallons, Water 20 gallons, Orange Flower Water 1 pint. Dissolve the oils in 1 gallon of the spirit and mix with the remainder of the articles as directed for London Cordial Gin. Other varieties may be made in the same general manner.

4518. To Filter Gin and other Liquors.—When Essential Oils are used in compounding liquors they turn milky and must be filtered. For this purpose a mixture of Burnt Alum 4 ounces, White Pipe Clay 6 ounces, Carbonate of Magnesium 4 ounces, Carbonate of Potassium ½ ounce, is put in a woollen bag or cloth, and the liquor filtered through the mixture until clear.

By adding a quart of Lime Water to a barrel of Gin the same result may often be accomplished.

4519. To clarify Gin or Cordials—*Spirit Finings* for this purpose are used, and may be made by first adding 2 ounces of powdered Alum dis-

solved in a quart of warm Water to a barrel, and after thoroughly stirring, adding 1 ounce of Sal Soda dissolved in 1 pint of Water.

By adding a quart of skimmed milk and 2 ounces of Gelatin dissolved in a quart of Water to a barrel of Gin or other liquor and allowing to settle, it is usually made clear, and the blackness which is liable to occur in Gin is removed; 3 or 4 eggs beat to a froth, mixed with a gallon of liquor and added to a barrel, will usually make it clear after standing.

4520. Liquors and Cordials.—A great variety of Cordials, sweetened and flavored Liquors, bitters, ratafias, etc., are made and used, but are not much in demand in this country. Almost every aromatic known is introduced in the manufacture of these cordials, etc. A few of them have been mentioned elsewhere, pages 262, 436, 439, etc., but the demand for them is so small, and the space so limited, that no more can be here introduced.

VARNISHES.

For coating and finishing the surfaces of wood, metals, glass, labels, pictures, etc., solutions of resins of various kinds in spirits or oils are employed. Most of these varnishes are purchased of manufacturing houses who make them in large quantities, but some of them are readily prepared and considerably used by druggists, among which are the following. Some other varnishes have been mentioned elsewhere :

4521. Label Varnish.—This may be made by dissolving pale Shellac 6 ounces in 12 fl.ounces of Alcohol by the aid of heat and adding to the warm solution 1 pint of Linseed Oil and 2 drachms of Chloride of Zinc, agitating them until the Zinc salt is dissolved. It is applied with a brush, or by dipping the label, or floating it.

A spirit varnish made with Sandarach, Shellac and Alcohol may also be used.

4522. Spirit Varnish.—Sandarach 3 ounces, pale Shellac 2 ounces, Alcohol 20 fl.ounces. Dissolve and add Copal Varnish 2 ounces, mix well strain through gauze, set aside for a month and decant the clear portion from the sediment. This is used for labels, pictures, Water colors, lithographs, etc.

4523. Shellac Varnish.—For "killing" knots in wood for polishing and many other purposes, Shellac Varnish is used. It is simply Shellac dissolved in Alcohol. About 3 pounds of Shellac with sufficient Alcohol to make a gallon. It is used thinner for some purposes.

4524. Transfer Varnish.—Mastic, Sandarach, each, 2 ounces, Alcohol 15 fl.ounces. Dissolve and add pure Canada Balsam 4 ounces. This is used for transferring engravings, lithographs, decalcomania pictures, etc., and for gilding, silvering, bronzing, etc.

4525. Other Varnishes.—Of the other varnishes that are used, *Demar Varnish* is made by dissolving Gum or Resin Demar in Oil of Turpentine, *Copal Varnish*, by dissolving Copal in Oil of Turpentine. This is also known as *Furniture Varnish and Carriage Varnish*, many varieties being made from different qualities of gum or resin, Mastic Varnish may be made by dissolving Mastic either in Alcohol or Oil of Turpentine.

Crystal Varnish is made from Canada Balsam mixed with an equal volume of Oil of Turpentine. It is also known as *Map Varnish*, and is used diluted with Oil of Turpentine for making tracing paper. *Wax Varnish* is prepared by melting 2 ounces of Wax with 6 ounces of Oil of Turpentine and mixing with a pint of Copal Varnish.

Sealing Wax Varnish is made from Shellac Sealing Wax dissolved in Alcohol. It is used for chemical and electrical apparatus, cork tops, etc. Many other varnishes are known and used.

Glass Varnish—for making a film on glass the Wax Varnish above is good. A transparent varnish for glass is made of Sandarach and Mastic, each 2 ounces dissolved in Alcohol 20 ounces.

UNCLASSIFIED PREPARATIONS.

4526. Purifying Bees' Wax.—Melt 10 pounds of wax with 1 pint of Vinegar and a quart of Water; when melted, strain and wrap the vessel and cover it with several thicknesses of cloth so that it will cool slowly; all sediment settles to the bottom and may readily be scraped off.

4527. Prepared Corks.—Corks may be prepared for resisting the action of acids, etc., by immersing them in melted Paraffin, and when removed putting them at once into cold Water; this gives them a coating of paraffin and fills all the cavities, making them imperious to acids, etc.

Burnt Cork may be prepared by placing a quantity of corks, in an iron kettle, covering closely and heating them until they are reduced to charcoal; they may then be powdered.

4528. Bleaching Sponges.—To bleach Sponges first dip them in a solution of Permanganate of Potassium 1 ounce in 1 gallon of Water, squeeze out the Water as much as possible, then pour upon them a solution prepared with Hyposulphite of Sodium 1 pound, Water 7 pints, Hydrochloric Acid 1 pint, until they are white, then to prevent turning yellow when dry dip in a solution of 2 drachms Bicarbonate of Sodium in 1 gallon of Water, and drain.

4529. Tooth Cement.—For filling the cavities of teeth Collodion may be used as it quickly sets, forming a plug; Portland Cement may also be used. A solution of Mastic, 1 part, in Alcohol, 3 parts, hardens quickly when put in the cavity of a tooth.

4530. Sulphur Lotion.—Sulphocarbolate of Zinc 20 grains, Oxide of Zinc 120 grains, Lac Sulphur 60 grains, Cologne 1 ounce, Glycerin 1 ounce,

Rose Water 5 ounces. Rub the Oxide of Zinc with the Lac Sulphur, and then with the Cologne; add the Glycerin and the Rose Water in which the Carbolate of Zinc has been dissolved.

4531. Boracic Acid Ointment.—Boracic Acid 1 part, Yellow Wax 1 part, Benzoinated Lard or Petrolatum 6 parts. Rub the Acid to a very fine powder with a few drops of Alcohol. Melt the Wax and Benzoinated Lard together and incorporate the powder with the mixture while cooling.

4532. Glycerin Cream.—Glycerin Cream 6 ounces, Soft Soap (Sapo Mollis 2908) 5 ounces, Rose Water, triple, 5 ounces, Tincture of Arnica $\frac{1}{2}$ ounce, Boric Acid $\frac{1}{2}$ ounce. Dissolve the Acid in the Glycerin by heat, and add the mixture to the other ingredients which have been previously well mixed in a mortar.

4533. Polyform Liniment.—This is said to be like Edson's preparation. Chloral Hydrate 1 ounce av., Alcohol 4 fl.ounces, Chloroform $2\frac{1}{4}$ fl.ounces, Camphor 2 ounces av., Ether 2 fl.ounces, Oil of Peppermint, Oil of Cloves, each, 5 drops, Salicylic Acid 5 grains, Nitrate of Amyl, Sulphate of Morphine, each, 3 grains. Mix them. This is used for Neuralgia, Tic Doloieux, etc.

4534. Local Anæsthetic.—For applying to the gums before extracting teeth and other similar purposes to numb the parts and prevent pain. It is also excellent for neuralgia, etc. Stronger Ether $1\frac{1}{2}$ ounce, Menthol 60 grains, Fluid Extract Cannabis Indica 20 minims, Cocaine 2 grains, Oil Peppermint 15 minims. Saturate absorbent cotton with a small quantity of the liquid and apply to the gums, allowing it to remain about 5 minutes before the operation.

4535. Curry Powder.—Coriander Seed, Turmeric, Dessicated Cocoanut, each, 4 ounces, Cassia Buds, Fenugreek Seed, Poppy Seed, each, 2 ounces, Mustard, Ginger, Mace, each, 1 ounce, Capsicum, Allspice and Garlic, each, $\frac{1}{2}$ ounce. Grind them all together to a fine powder. This is a fair imitation of the genuine Indian Curry Powder. It is used for seasoning.

4536. Celery Salt.—Celery Seed, in fine powder, 1 ounce, Fine, dry table Salt 7 ounces. Mix them well together.

4537. Pepper Sauce.—This is conveniently made by adding good vinegar to whole Bird Pepper, or Capsicum contained in a Pepper Sauce bottle.

4538. Worcestershire Sauce.—The composition of this sauce is a trade secret, but a variety of similar sauces are found on the market. A good imitation may be made as follows: Chop the green outer covering of unripe walnuts 5 pounds, bruise them to a pulp in a mortar, pour upon them 6 pints of good strong vinegar, and after standing a day heat to boiling and strain with strong pressure. To the liquid thus obtained add garlic, grated to a pulp, 2 ounces, Capsicum, in fine powder, 2 ounces, Black Pepper 1 ounce, Cinnamon $1\frac{1}{2}$ ounce, Nutmeg $\frac{1}{2}$ ounce, Allspice 1 ounce, Cloves $\frac{1}{2}$ ounce, all in fine pow-

der, Salt 12 ounces, Brown Sugar 8 ounces, and enough good vinegar to make 1 gallon of the finished product. This is to stand for some time, with frequent agitation, and then be put up in bottles.

4539. Sugar of Lemons.—Citric Acid 1 ounce, Extract of Lemon 1 ounce, Sugar 1 pound. Powder the Acid and mix thoroughly with the Sugar, rub the Extract of Lemon first with a small quantity of the mixture and then with the remainder gradually added. A tablespoonful of this makes a small glass of lemonade.

4540. Butter Color.—Annatto, fresh and of good quality, 2 pounds, Salad Oil of good quality without flavor (purified cotton seed oil is best), sufficient to make 1 gallon. Rub the Annatto with a portion about one third of the Oil and macerate it by the heat of a water-bath for 12 hours, stirring occasionally, pour off the liquid and add to the residue another portion, about one third of the Oil, and macerate as before, adding the product to the portion before reserved, then add the remainder of the Oil to the sediment, macerate as before and add the product to the reserved portions to make 1 gallon of Butter Color.

4541. Absorbent Cotton.—This is prepared from fine selected cotton by first washing it thoroughly with a weak solution of Sal Soda, and afterwards with clear water, then carefully drying. Probably most of the "Absorbent Cotton" of the market is nothing but fine selected cotton put up in packages, without treatment.

4542. Aseptol.—This is a sticky faint red liquid of specific gravity, 1.450, its odor resembling Carbolic Acid. It is chemically, orthoxyphenyl sulpho acid ($C_6H_4OH(SO_2H)_2$), and its properties are like Carbolic Acid, but three times its strength, and like Salicylic Acid, and its solution is used externally as a wash and antiseptic in place of Carbolic Acid, and internally is administered instead of Salicylic Acid, the dose being 2 to 4 grains.

4543. Hypnone. This is made by distilling together a mixture of benzoin and acetate of calcium. It is chemically phenylmethylacetone (C_8H_8O). It is used as a Hypnotic for Alcoholic insomnia, etc. The dose is 3 to 5 minims.

4544. Ichthyol.—This substance was discovered by Schrotter, and is obtained by distilling bituminous matter found in Tyrol, which contains the fossilized remains of fish and marine animals.

4545. Phenacetine.—This is a new chemical derived from the coal tar products, and recommended to be used in place of Antipyrine, being similar to it in action, and claiming to be free from any deleterious effects.

4546. Strophanthin.—This is a new toxic remedy similar in characteristics to digitalis, and is said to be obtained from the African arrow poison plant *strophanthus hispidus*.

4547. Vienna Paste or Caustic.—Powder and mix together in a warm mortar equal parts of Potassa and Unslacked Lime, see 2712.

I N D E X.

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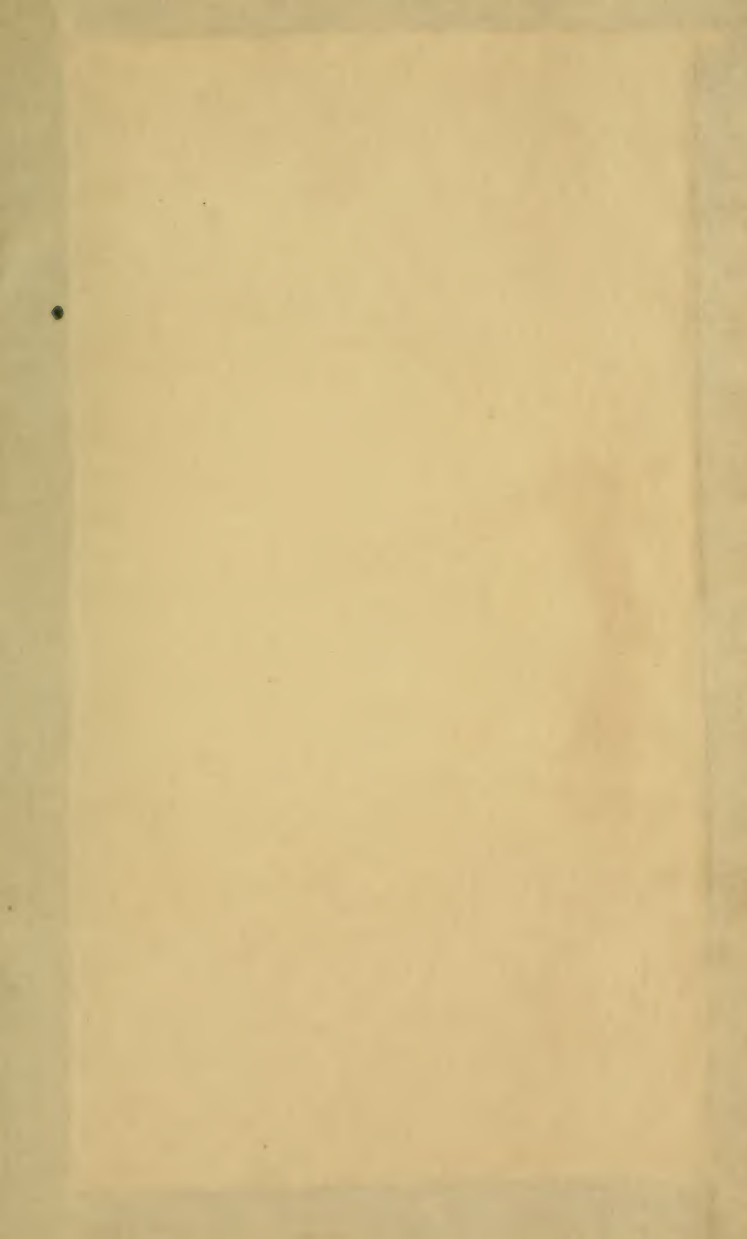
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