Elements of pharmacy.

ELEMENTS OF PHARMACY

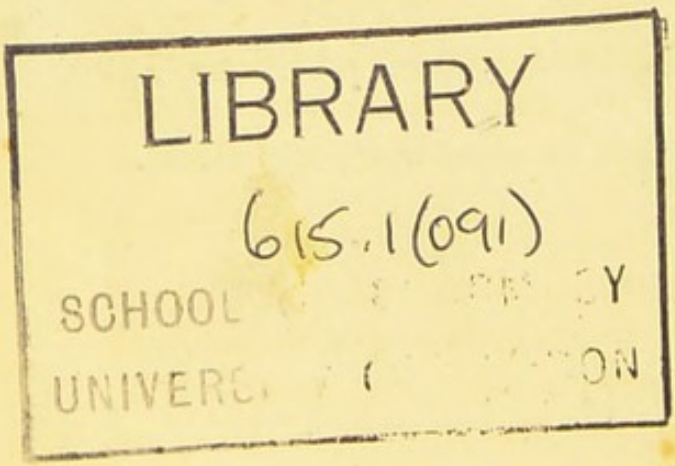
WILLS

PREFACE.

THIS book is brought out in conjunction with a work on Vegetable Materia Medica by the same author, and is meant to be studied in connection with it. It contains an account of all the official preparations of the drugs of the Materia Medica. The principles and "the why and wherefore" of the different processes are fully discussed, the numerous improvements in the preparations of the British Pharmacopœia, 1885, and its additions, 1890, are given, and their advantages, or otherwise, explained.

G. S. V. W.

September, 1891.



ELEMENTS OF PHARMACY.

By the term PHARMACY is meant the study or art of the manipulation of drugs. The term is used and applied to substances which do not properly come under the head of materia medica, chemistry, or therapeutics.

Practical Pharmacy for convenience is divided into three sections :—

1. *Abstract or General Pharmacy*, including the grinding of drugs, &c.
2. *Official Pharmacy*, including the Galenical preparations of the Pharmacopœia.
3. *Extempore Pharmacy*, including the manipulation at the dispensing counter.

Most of the preparations contained in this manual are termed "*Galenical*," having reference to Galen, a Greek Physician, born A.D. 131, at Pergamos, in Asia Minor. He compiled a book of formulæ, known as Theriaca.

The term *galenical* is applied to official formulæ, to distinguish them from those ordered by the physician.

The following are brief explanations of some of the terms mentioned in the directions for the manufacture of the various preparations.

Ablution, process of washing, as in the case of precipitates.

Baths. There are three baths used in the B.P., viz :— steam, water, and sand. The temperature of a steam bath is about 230° F. ; water bath about 208° F. ; a sand bath can be raised to almost any temperature.

Clarification is the purification of a liquid, or semi-liquid, such as honey or lard, by melting it, and while still fluid, straining through flannel or some similar substance.

Crystallisation is a term applied to the process by which substances assume definite and well defined geometrical forms, called crystals.

Substances which do not crystallise are termed amorphous, *i.e.* formless. Water of decrepitation is taken up when certain salts crystallise in the cubic form, it remains as water.—Examples: *Iodide and bromide of potassium.*

Calcination is the process of reducing a substance to a powder, or to a friable state, by heat, whereby water and volatile matters are driven off. Oxides of zinc, calcium, and magnesium, are prepared by this process from their respective carbonates.

Decoction is the act of boiling a drug with water to extract its virtues. The process is not a suitable one for substances containing aromatic constituents.

Decoloration is to deprive substances of their colour. Purified animal charcoal is ordered to be used in the Pharmacopœia, in the preparation of morphine, &c.

Desiccation is the process of drying substances. Some substances are ordered to be dried by means of a water bath, others at a much higher temperature, while others are allowed to dry spontaneously.

Dialysis is a process of separating colloids (non-crystallisable substances) from crystalloids (crystallisable substances). The process depends upon the unequal rates at which these substances pass through a membrane. Crystalloids pass rapidly; colloids remain on the dialyser, that which passes through is called the diffusate; the liquid remaining on the dialyser is the dialysate.

Digestion is similar to maceration, but is carried out at a special temperature.

Distillation is the changing of a liquid into vapour by means of heat, the vapour being condensed into a liquid by a cooling apparatus, known as a condenser, or by pressure. This process is applied in order to separate volatile from fixed substances. The fluid which passes over is called the **distillate**, that which remains in the retort, the **residue.**

Fractional distillation is distilling a mixture of bodies at different temperatures in order to separate those substances which have different boiling points.

Destructive distillation consists in decomposing bodies by heat in partly closed vessels ; the resulting vapours, being condensed, form new products.

Decantation consists in gently pouring a liquid from one vessel into another.

Ebullition is the process of boiling. When the evaporation is accompanied by bubbles of vapour, the fluid is said to be in a state of ebullition. The amount of elastic force exerted is termed its **tension**. A liquid boils when the tension of its vapour is sufficient to overcome the pressure of the atmosphere.

Elutriation is the process of separating, by means of water, coarsely powdered substances when mixed with finely powdered bodies. The former sink to the bottom, whilst the latter remain suspended and are poured off. The solution on standing deposits the elutriated powder. Calamine and prepared chalk are treated in this way.

Evaporation, or vaporisation, consists in the conversion of a fluid into gas or vapour at a temperature lower than its boiling point. When the whole of the liquid has been evaporated, it is said to be evaporated to dryness, the substance which remains is called the **residue.** This process is employed in the making of extracts, and in the crystallisation of certain salts.

Filtration is the separation of insoluble from soluble matter by transferring to a piece of folded blotting paper, linen, calico, or cloth. The liquid which passes through should be clear and bright, and is called the **filtrate**, whilst the insoluble portion remains on the filter.

Straining differs from filtering in that a coarser material is used, such as to w, asbestos, muslin, &c., and the process is much quicker.

Fusion is the act of converting a solid into a liquid by the application of heat. The temperature at which the solid passes into the liquid form is termed its **fusing** point. This process is used in the manufacture of plasters, ointments, &c

Granulation is the process of converting ordinary crystals into grains or small masses. This process usually consists in dissolving the substance in water, and evaporating the solution, keeping it briskly stirred.—Examples : Citrate of potassium, carbonate of potassium, &c. Granulated sulphate of iron is prepared by filtering the solution of sulphate of iron into spirit.

Grinding is the reduction of a substance to a fine state of subdivision.

Infusion is the process of extracting active principles from drugs, by macerating them in water, at any temperature below the boiling point of water, in a covered vessel for a definite period. Generally boiling water is used, but in the case of calumba and quassia, cold water is substituted ; whilst such drugs as cusparia and chirata are infused in water at 120° F.

Levigation is the act of reducing a substance to a fine powder in the presence of water, or some other fluid.

Lixiviation is the digestion of a mixture of solid substances in a fluid, so as to dissolve out the soluble portion, the solution being poured off from the insoluble portion and evaporated. The solution is usually drawn off by means of a siphon. This process is adopted in the preparation of carbonate of potassium from pearl-ash.

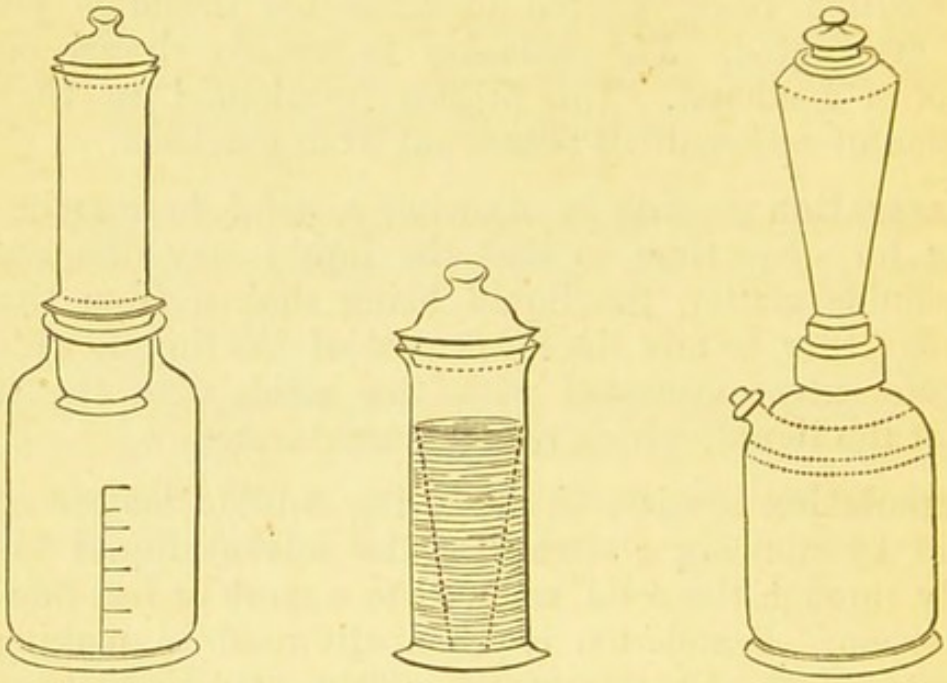
Maceration consists in allowing a solid to remain in a liquid for some time, so that the liquid may dissolve out any soluble matter, the liquid being shaken from time to time in order to mix the lower part of the liquid, which is to some extent saturated with the solid, with the upper part of the liquid, which remains unsaturated.

Percolation consists in dissolving soluble matter out of a solid by allowing a stream of the solvent liquid to pass slowly through the solid, reduced to a more or less fine state of division. Percolation is principally used in making the tinctures of the Pharmacopœia. There can be little doubt but that percolation is a much more thorough and complete mode of exhausting a drug than maceration. The percolator is a long and narrow vessel, in which the drug is packed, the consequence is that each portion of the liquid has to pass over each successive portion of the drug, and therefore thoroughly exhausts it.

Apparently percolation and filtration resemble one another, but in reality they have precisely different objects; in percolation a liquid and a solid are commenced with, and in the end the liquid contains in addition something dissolved in it which it did not contain previous to percolation; in filtration, a liquid and a solid are started with, and in the end the liquid does not contain the solid which was previously suspended in it; in other words, in percolation the liquid is "plus" something it had at first; while in filtration the liquid is "minus" something that it previously contained.

There is much difference of opinion with regard to the shape the percolator should possess. Two forms of per-

colators are in common use, viz., the cylindrical and the conical.



Of these two forms, the slightly conical percolator is decidedly the better, for the following reasons :—

1st.—A liquid in passing through a drug packed in a long and narrow vessel has a tendency to pass down in a sloping direction, as indicated by the dotted line in the centre figure. So that the drug in the corners at the bottom of the percolator will remain untouched by the liquid ; therefore it is better to use a conical percolator, the shape of which corresponds with the direction the liquid takes.

2nd.—A conical percolator is not so likely to become blocked up as a cylindrical one ; for in the conical percolator, when the drug swells it presses against the sloping sides of the vessel and is forced upwards ; in the cylindrical percolator, when the drug swells, it simply presses against the straight sides, and tends to cause a block.

There is one disadvantage connected with the conical percolator, viz., that most of the drug is at the top, where in consequence of the liquid exerting least pressure, the

drug will not be so thoroughly exhausted as at the bottom; whereas in the cylindrical percolator there is as much of the drug at the bottom as at the top.

In the Pharmacopœia, maceration of the drug is generally ordered previous to percolation; this is in order to open the pores of the drug and to allow it to swell, so that there shall be no fear of the percolator becoming blocked.

Precipitation is a process of separating a solid from a solution, by the addition of a reagent, or by some physical action.

Pulverisation is the process of reducing solids to powder.

Rectification is a process of repeated distillation in order to strengthen or purify the distillate.

Sifting is the process of separating a mixture of coarse and fine substances by means of a sieve. A sieve is an apparatus made of different materials, such as fine silk, hair, twine, muslin, or brass wire.

Solution is the union of a liquid (termed the solvent) with another liquid, solid, or gas, the combination being so intimate that gravitation will not separate the denser from the lighter.

The presence of one salt will affect the solubility of another, either increasing or decreasing it. Heat increases the solubility of most salts; chloride of sodium forms an exception to this rule. Cold and pressure increase the solubility of gases. Simple solution of solids causes a diminution of temperature. When the solid combines chemically with water, an increase of temperature is the result. The solution of a gas causes a rise of temperature.

Bodies which do not dissolve in the liquid are termed *insoluble.* The liquid used is called the *menstruum* or *solvent.* When the solvent will not take up any more of the solid, it is said to be saturated. If the mixture be composed of several solids they may be separated by using different quantities of the solvent; this is termed *fractional solution.*

Sublimation is similar to distillation, it consists in changing a solid into a vapour by means of heat, and causing it to be deposited on a cool surface in the solid state. The condensed portion is termed a **sublimate.** A mixture of substances may be separated by this means. This process is termed **fractional sublimation.**

Trituration is the act of reducing a substance to a fine powder.

Acetanilidum.

Acetanilide.[1]

C_8H_9NO.

Synonym.—Phenyl-acetamide $C_6H_5{\cdot}NH{\cdot}C_2H_3O$.

A crystalline substance obtainable by the action of glacial acetic acid on aniline, and subsequent purification.

Characters and Tests.—Colourless, glistening, scaly crystals, having a slightly pungent taste and neutral reaction. Melting point, about 235° F. (112°·8 C.) It is soluble in about two hundred parts of cold water; freely soluble in rectified spirit, ether, benzol, and chloroform.

Heated with free access of air, it burns, leaving no residue. With sulphuric acid it forms a colourless solution. It is soluble in eighteen parts of boiling distilled water, forming a clear, neutral, inodorous solution which, when cool, is not affected by solution of perchloride of iron. Heated with solution of potash and a few drops of chloroform, the unpleasant odour of phenyl-isonitrile is developed.

Dose.—3 to 10 grains.

Aceta.

Vinegars.

There are 2 official vinegars, viz., *Acetum Scillæ* and *Acetum Cantharidis.*

[1] Acetanilide is commonly known as "Antifebrin."

Acetum ($HC_2H_3O_2$).

Vinegar.

An acid liquid prepared from a mixture of malted and unmalted grain by acetous fermentation.

In this country most of the vinegar is made from malt wash, or gyle, prepared by operating upon the materials in the following proportions; 6 bushels of barley malt, properly ground, are mashed with 40 gallons of water at 160° F., allowed to rest till the solid matter settles down, when the solution is drawn off, and a fresh quantity of water, about 40 gallons, at 180° F. added to the residue, well agitated for a short time, allowed to settle, and then siphoned off as before. To take up all the soluble matters, a third washing may be performed with boiling water. On the whole not more than 100 gallons of wash is to be used in extracting soluble matters. When the solution has cooled to about 75° F., it is well agitated with 4 gallons of beer yeast; and after 36 to 40 hours, racked off into casks, and placed in the vinegar stoves or apartments, the temperature of which should range from 70° to 77° F. The casks should be placed on their sides, the bung holes opened, and a circulation of air kept up in each cask by means of an orifice bored at each end, near its upper edge. Since the temperature of the liquid is somewhat less than the surrounding atmosphere, in consequence of the evaporation at the surface, an efflux of cold air takes place at the holes, while the warm air enters at the bung holes, and thus a constant current is kept up.

This manufacture is frequently effected by fielding. In this case, the process is conducted in the open air by arranging the casks in rows parallel to each other. They are partly filled by means of a hose. The bung holes are left open in dry, and are loosely covered with tiles in wet weather, about one-third of the cask is left empty for the circulation of air, so as to oxidise the alcohol as it generates

in the wort. Three months are required to complete the process and render the vinegar marketable.

Vinegar contains, according to the Pharmacopœia of 1885, 5·41 per cent. of real acetic acid ; according to the Pharmacopœia of 1867, it contained only 4·6 per cent. Its specific gravity is 1·017 to 1·019. The sp. gr. gives no true indication of its acid strength, but it might indicate the presence of foreign substances, such as preserving agents, which are frequently added to it. Sulphuric acid is permitted to be added to it by the Excise authorities, as a preservative, to the amount of 1 part in 1000.

Test.—If 10 minims of solution of barium chloride be added to 1 fl. oz. of the vinegar, and the precipitate, if any, be separated by filtration, a further addition of the test solution should give no precipitate. The absence of metallic impurities is indicated by sulphuretted hydrogen producing no change in colour.

Impurities.—Excess of sulphuric acid, nitric acid, sulphurous acid, salicylic acid, &c.

Nitric acid in vinegar may be detected by adding solution of sulphate of indigo and warming ; if nitric acid be present the colour is discharged. The acid strength of vinegar is estimated by the quantity of volumetric solution of soda required to neutralize a given quantity of the vinegar. 1 fl. oz. of official vinegar requires 402 grain measures.

Dose.—1 fl. drachm to 1 fl. ounce.

The only official preparation, in which vinegar is used, is Emplastrum Saponis Fuscum, formerly termed Emp. Cerati Saponis.

Distilled Vinegar.

This is prepared by the oxidation of alcohol; but the manner in which it is oxidized is different, the surface exposed being many thousand times more extensive.

When the oxidation of alcoholic solutions is slow, aldehyd is the principal product; aldehyd, however, absorbs oxygen with great avidity; hence, if the supply of oxygen be abundant it is in the moment of fermentation converted into acetic acid. The process consists of making the solution of alcohol, such as French wine, &c., to percolate slowly through and diffuse over a mass of shavings; or to run down towers, up which a current of air is passed; the vinegar is afterwards distilled.

Acetum Cantharidis.

Vinegar of Cantharides.

Cantharides, bruised	... ...	2 ounces.
Glacial Acetic Acid	... ...	2 fl. ounces.
Acetic Acid sufficient for	...	20 fl. ounces.

Mix 13 fluid ounces of the acetic acid with the glacial acetic acid, and digest the cantharides in this mixture for 2 hours at a temperature of 200° F.; then transfer the ingredients, after they have cooled, to a percolator, and when the liquid ceases to pass, pour 5 fluid ounces of acetic acid over the residuum in the apparatus. As soon as the percolation is complete, subject the contents of the percolator to pressure; filter the product, mix the liquids, and add sufficient acetic acid to make one pint. Specific gravity about 1·000.

If a higher temperature than 200° F. were used the acetic acid would be driven off.

As cantharides contain a small quantity of fatty substance, glacial acetic acid is added to strengthen the

acetic acid used, thus more of the active principle of the cantharides (cantharidine) is dissolved out and the preparation strengthened.

Heat is applied to promote the solution of cantharidine.

Acetum Ipecacuanhæ.

Vinegar of Ipecacuanha.

Ipecacuanha, in No. 20 powder	1 ounce	... or ...	1 part.
Diluted Acetic Acid sufficient for	20 fl. ounces	,, ...	20 fl. parts.

Moisten the powder with a suitable quantity of the menstruum, and macerate for twenty-four hours; pack in a percolator, and gradually add the acid until the required volume of the vinegar of ipecacuanha is obtained.

Dose.—5 to 40 minims as an expectorant.

Acetum Scillæ.

Vinegar of Squill.

Squill, bruised	$2\frac{1}{2}$ ounces.
Diluted Acetic Acid	1 pint.

Macerate the squill in the acetic acid for 7 days, then strain with expression, and filter.

Specific gravity *about* 1·038.

The spirit has been omitted from the present Pharmacopœia, as it is supposed to combine with the acetic acid to

form acetic ether, which precipitates the active principle of squills. It was formerly introduced with the view of retarding decomposition.

Dose.—15 to 40 minims.

Preparations in which Vinegar of Squill is used.—Oxymel Scillæ and Syrupus Scillæ.

Acidum Aceticum. $HC_2H_3O_2$.

Acetic Acid.

An acid liquid obtained from wood by derucsttive distillation and subsequently purified.

The distillation of wood, principally beech, birch, and oak, is carried on in large cast-iron cylinders, or in square ovens made of stout sheet-iron, the heat being applied to them directly. The water which is extraneous to the wood first passes off, then the wood itself is decomposed, forming water and impure acetic acid known as crude pyroligneous acid, which contains methylic alcohol or wood naphtha, acetic acid, acetone, ethylic alcohol, &c.; condensable matters containing an excess of carbon, forming the tar and oily substances, also pass over; the condensable matters separate into two layers, the lower portion constituting wood tar, the upper or fluid portion containing the creasote; charcoal, similar in form to the wood introduced, remains in the retort.

The pyroligneous acid is saturated with milk of lime, which forms acetate of calcium; this is decomposed with a hot solution of sulphate of sodium, yielding impure sodium acetate; the impure salt thus formed is heated in a reverberatory furnace in order to free it as much as

possible from tarry matter. It is finally distilled with sulphuric acid, and rectified by distilling it two or three times with chloride of calcium.

The official acetic acid contains 33 per cent. of real acetic acid, and has a sp. gr. of 1·044.

Impurity.—Sulphurous acid. This is formed by the reduction of a little sulphuric acid by traces of carbonaceous matters left in the acetate of sodium.

Test.—Chlorine gas passed into the acid decomposes the water, liberating oxygen, which converts the sulphurous acid into sulphuric acid, which may be detected by adding a solution of chloride of barium, a white precipitate will be thrown down, insoluble in hydrochloric or nitric acid. The Pharmacopœia orders a few pieces of granulated zinc and dilute hydrochloric acid to be added, and during effervescence, a slip of bibulous paper, wetted with a solution of subacetate of lead, to be suspended in the upper part of the flask, which should not be discoloured, proving the absence of sulphuretted hydrogen.

The zinc and hydrochloric acid produce nascent hydrogen, which reduces the sulphurous acid, if present, to sulphuretted hydrogen.

$$Zn + 2HCl = ZnCl_2 + H_2$$
$$H_2SO_3 + 3H_2 = 3H_2O = H_2S.$$

Acidum Aceticum Dilutum.

Diluted Acetic Acid.

Acetic Acid	1 pint.
Distilled Water	7 pints.

Sp. gr. 1·006. 440 grains by weight require for neutralisation 313 grain measures of volumetric solution of soda, corresponding to 4·27 per cent. of real acetic acid.

Acidum Aceticum Glaciale.

Glacial Acetic Acid (*from Glacies, ice*).

Concentrated acetic acid, containing 99 per cent. of real acetic acid.

Prepared by distilling finely powdered anhydrous acetate of sodium, with three times its weight of strong sulphuric acid, purifying and exposing to a low temperature.

$$NaC_2H_3O_2 + H_2SO_4 = HC_2H_3O_2 + NaHSO_4.$$

The distillate is frequently found to contain sulphurous acid (proved by its liberating iodine from a solution of iodate of potassium, or by the test given under acetic acid). It must be rectified with a little bichromate of potassium, by which means any sulphurous acid is converted into sulphuric acid, which remains behind in the retort on redistillation.

$$2K_2CrO_4CrO_3 = 2K_2CrO_4 + Cr_2O_3 + O_3$$
$$3H_2SO_3 + O_3 = 3H_2SO_4$$

It may also be converted into sulphuric acid by agitation with black oxide of manganese and redistilling.

It crystallises when cooled to 34° F., and remains crystalline until the temperature rises above 60° F. Its sp. gr. is 1·058, which is increased by the addition of water up to 10 per cent. This occurs from contraction in bulk, due to the formation of a definite hydrate of acetic acid, a further addition of water will reduce its density, it being merely a solution of the hydrate. The density is no criterion of the amount of acetic acid present. Its strength

is estimated by the quantity of volumetric solution of soda required to neutralise a weighed quantity of the acid. 60 grains by weight require 990 grain measures of solution of soda. Until mixed with water it does not redden litmus paper.

It is used in the preparation of Acetum Cantharidis, Mistura Creasoti, Linimentum Terebinthinæ Aceticum, and Liquor Ferri Acetatis Fortior.

Acidum Arseniosum. As_2O_3.

Arsenious Acid.

Synonyms:—Arsenic; Arsenicum Album; White Arsenic; Anhydrous Arsenious Acid; Arsenious Anhydride.

An anhydride (not a true acid) obtained by roasting arsenical ores, and purified by sublimation.

It occurs as a heavy white powder, or in sublimed masses which usually present a stratified appearance caused by the existence of separate layers differing from each other in degree of opacity. When slowly sublimed in a glass tube it forms minute brilliant and transparent crystals of octahedral character. It is sparingly soluble in cold water, more soluble in boiling water, and its solution, which is odourless and tasteless, gives with ammonio-nitrate of silver a canary-yellow precipitate insoluble in water but readily dissolved by ammonia and by nitric acid. Sprinkled on a red-hot coal it emits an alliaceous odour. It is entirely volatilized at a temperature not exceeding 400° F. 4 grains of it dissolved in boiling water with about 20 grains of bicarbonate of sodium, discharge the colour of 808 grain measures of the volumetric solution of iodine.

Dose.—$\frac{1}{60}$ to $\frac{1}{12}$ grain.

Used in the preparation of Liq. Arsenicalis and Liq. Arsenici Hydrochloricus.

Acidum Benzoicum. $HC_7H_5O_2$.

Benzoic Acid.

Benzoic Acid occurs in gum benzoin, in the balsams of Peru and Tolu, and in the urine of herbivorous animals.

It is prepared on the large scale from gum benzoin by sublimation and from the urine of horses and cows by treating the hippuric acid with hydrochloric acid; also from toluene, by converting it into chloride of benzoyl and oxidizing this with diluted nitric acid.

It occurs in light feathery crystalline plates and needles, which are flexible, nearly colourless, and have an agreeable aromatic odour, resembling that of benzoin. It is sparingly soluble in water, but readily in rectified spirit; soluble also in solutions of the alkalies and of lime, forming benzoates, it is precipitated from these on the addition of hydrochloric acid, unless the solution be very dilute. It melts at 248° F., and boils at 462° F. When heated to the last-named temperature it passes off in vapour, leaving only a slight residue.

Dose.—10 to 15 grains.

Used in the preparation of Tinct. Camph. Co.; Tinct. Opii Ammoniata; Trochisci Acidi Benzoici; Ammonii Benzoas.

Acidum Boricum. H_3BO_3.

Boric Acid.

Synonym:—Boracic Acid.

A weak acid obtained by the action of sulphuric acid on borax, and by the purification of native boric acid.

It occurs in colourless, pearly, lamellar crystals or irregular masses of crystals; easily powdered; unctuous to

the touch; taste feebly sour and bitter, and leaving a sweetish after-flavour in the mouth. Soluble in 25 parts of water, 5 of glycerine, 16 of rectified spirit at 60° F., and in 3 of boiling water. It changes the colour of litmus to wine-red; turmeric paper moistened with an aqueous solution slightly acidified with hydrochloric acid, becomes brownish red on gently drying, and this colour changes to greenish if solution of potash be added. The alcoholic solution burns with a flame tinged with green. The crystals liquefy when warmed, and on careful ignition lose $43\frac{1}{2}$ per cent. of their weight, the product solidifying, on cooling, to a brittle glass-like mass. The aqueous solution should not yield more than a faint opalescence with chloride of barium, (*absence of sulphates*) nitrate of silver (*absence of chlorides*), or oxalate of ammonium (*absence of lime*); nor afford any precipitate with sulphydrate of ammonium (*absence of metals*); nor give a strong persistent yellow tinge to a spirit flame or air-gas flame (*absence of borax*).

Dose.—5 to 30 grains.

Used in the preparation of Unguentum Acidi Borici.

Acidum Carbolicum. C_6H_5HO.

Carbolic Acid.

Synonyms:—Phenic Acid; Phenol; Phenic Alcohol.

An acid obtained from coal-tar oil by fractional distillation and subsequent purification.

When coal-tar is heated, the first portions of the distillate float on water and constitute what is called the **light oil**, after a time the hydrocarbons of a greater specific gravity pass over, which sink in water and constitute the **heavy oil.**

The heavy oil is treated with an alkali, which dissolves the phenol. From this solution it is precipitated by hydrochloric acid and purified by distillation.

It is not an acid, but a phenol. The reason it is designated an acid, is because it contains hydrogen, which can be displaced by metals, as in carbolate or phenate of sodium.

It is described officially as being in separate pulverulent crystals having a peculiar taste and odour, or in acicular crystalline masses; colourless, or having a very slight reddish or brownish tinge; boiling point not higher than 371° F. and melting point not lower than 91·5° F. Specific gravity at the melting point 1·060 to 1·066. At 60° F. 100 parts of the acid are liquefied by the addition of 5 to 10 parts of water; dissolve 30 to 40 of water; and are dissolved by 1,800 to 1,200 of water; the former and latter of these numbers being respectively characteristic of the acicular and pulverulent varieties of the acid. The aqueous solution should be clear and colourless, or nearly so; any insoluble brown matter separating as dark oily drops, which should not have more than a faint tarry odour. Carbolic acid is freely soluble in alcohol, ether, benzol, chloroform, disulphide of carbon, glycerine, or glycerine and water, and in solutions of alkalies. It does not redden blue litmus paper (*absence of free acids*). It coagulates albumen. It does not affect the plane of polarisation of a ray of polarised light. Neutral solution of perchloride of iron strikes a deep purple colour, and bromine water gives a white precipitate with a cold saturated aqueous solution of carbolic acid. Solution of ammonia and of chlorinated soda produce a deep purple coloration, especially after a time. When pure, sulphuric acid will dissolve it, without change of colour.

It resembles creasote in many of its characters and properties. The following table will show the difference between them :—

Carbolic Acid.	Creasote.
1. Crystalline solid at ordinary temperatures.	1. Liquid at ordinary temperatures.
2. Neutral ferric chloride strikes a deep purple colour.	2. Neutral ferric chloride strikes a green colour changing to reddish brown.
3. Soluble in Glycerine.	3. Insoluble in Glycerine.

The pink colour of carbolic acid is due to numerous causes, such as traces of cresylic acid and aurine; the presence of nitrous fumes in the air will bring it about; it is supposed to be due to the decomposition of the impurities contained in the acid.

Dose.—1 to 3 grains.

Used in the preparation of Glycerinum Acidi Carbolici; Suppos. Acidi Carbolici cum Sapone; Acid. Carbolicum Liq.; and Ung. Acidi Carbolici.

Acidum Carbolicum Liquefactum.

Liquefied Carbolic Acid.

Carbolic acid liquefied by the addition of 10 per cent. of water.

It is a colourless or very slightly reddish or brownish liquid, having the taste, odour, &c., of carbolic acid. Specific gravity 1·064 to 1·067 at 60° F. Boiling point gradually rising to a temperature not higher than 371° F. It dissolves 18 to 26 per cent. of water at 60° F., yielding a clear or nearly clear solution, from which any slight coloured impurity contained previously in the acid separates as dark oily drops.

Dose.—1 to 4 minims.

Acidum Chromicum. CrO_3.

Chromic Acid.

Synonyms :—Anhydrous Chromic Acid ; Chromic Anhydride.

It is an anhydride (not a true acid). It may be obtained by the following process :—

Bichromate of Potassium...	...	...	30 ounces
Sulphuric Acid ...	...	...	57 ounces
Distilled Water ...	...	...	a sufficiency.

Dissolve the bichromate of potassium in a mixture of 50 fluid ounces of the water and 42 fluid ounces of the acid. Set aside for twelve hours, and decant the liquor from the crystals of acid sulphate of potassium that have separated. Heat the liquor to about 185° F., and add the remainder of the acid, and water sufficient to just redissolve any crystals of chromic acid that may have been 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.

It occurs in crimson acicular crystals, very deliquescent, inodorous, corrosively caustic to the skin. At a high temperature it melts and at a still higher temperature decomposes, with the evolution of oxygen gas, leaving a greenish-black residue (*chromous anhydride*). Warmed with hydrochloric acid, chlorine is evolved. Mixed with cold alcohol, aldehyd is evolved.

It is soluble in water, yielding a deep orange-red solution (*chromic acid*). If placed in contact with alcohol, glycerine, and some other organic matters, sudden combustion or explosion may ensue. One or two grains dissolved in two or three ounces of water should afford only a faint opalescence with chloride of barium (*absence of sulphates*).

Used in the preparation of Liquor Acidi Chromici.

Acidum Citricum. $H_3C_6H_5O_7,H_2O$.

Citric Acid.

An acid prepared from lemon-juice.

It is prepared officially by the following process :—

Lemon Juice	...	...	...	4 pints
Prepared Chalk	...	...	...	$4\frac{1}{2}$ ounces
Sulphuric Acid	...	...	...	$2\frac{1}{2}$ fluid ounces
Distilled Water	...	...	...	a sufficiency.

Heat the lemon juice to its boiling point and add the chalk by degrees till there is no more effervescence. Collect the deposit (*citrate of calcium*) on a calico filter, and wash it with hot water till the filtered liquor passes from it colourless. Mix the deposit with a pint of distilled water, and gradually add the sulphuric acid previously diluted with a pint and a half of distilled water. Boil gently for half an hour, keeping the mixture constantly stirred. Separate the acid solution by filtration, wash the insoluble matter (*sulphate of calcium*) with a little distilled water (*to remove all the citric acid*), and add the washings to the solution. Concentrate this solution to the density of 1·21 (*to get rid of all the sulphate of calcium*), then allow it to cool, and after 24 hours decant the liquor from the crystals of sulphate of calcium which will have formed ; further concentrate the liquor until a film forms on its surface, and set it aside to cool and crystallise. Purify the crystals if necessary by recrystallisation.

100 parts of lemon juice yield about $5\frac{1}{2}$ parts of the acid. It occurs in colourless rhombic crystals, very soluble in water. The crystals dissolve in three-fourths of their weight of cold, and in half their weight of boiling water. The diluted aqueous solution has an agreeable acid taste. When the solution is made by dissolving about 40 grains of the acid in one ounce of water, it resembles lemon juice in strength and in the nature of its acid properties, and, like lemon juice, it

undergoes decomposition and becomes mouldy by keeping. The aqueous solution is not darkened by sulphuretted hydrogen (*absence of metals*), gives no precipitate when added in excess to solution of acetate of potassium (*absence of tartaric acid*) or of chloride of barium (*absence of sulphates*), and if sparingly added to cold lime water it does not render it turbid (*absence of tartaric acid*). The crystals leave no ash when burned with free access of air. When heated to 175° C. it loses water and yields aconitic acid.

Dose.—10 to 30 grains.

Used in the preparation of Succus Limonis; Syr. Limonis; Vin. Quininæ; Liq. Ammonii Citratis Fortior; Bismuthi Citras; Liq. Bismuthi et Ammonii Citratis; Ferri et Ammonii Citras; Ferri et Quininæ Citras; Lithii Citras; Potassii Citras; and Sodii Citro-tartras Effervescens.

Acidum Gallicum. $H_3C_7H_3O_5,H_2O$.

Gallic Acid.

An acid prepared from galls. It may be obtained by the following process:—

Boil one part of coarsely powdered galls with 4 fluid parts of diluted sulphuric acid for half an hour, then strain through calico while hot; collect the crystals that are deposited on cooling, and purify these with animal charcoal and repeated crystallisation.

It occurs in acicular prisms or silky needles, sometimes nearly white, but generally of a pale fawn colour. It requires about 100 parts of cold water for its solution, but dissolves in 3 parts of boiling water. Soluble also in rectified spirit. The aqueous solution gives no precipitate with solution of isinglass (*absence of tannic acid*). It gives

a bluish-black precipitate with a persalt of iron. When heated, it yields pyrogallic acid and carbon dioxide.

Dose.—2 to 10 grains.

Used in the preparation of Glycerinum Acidi Gallici.

Acidum Hydrobromicum Dilutum. HBr.

Diluted Hydrobromic Acid.

Is an aqueous solution containing 10 per cent. by weight of gaseous or real hydrobromic acid. Officially it is prepared by the following process :—

Bromine	...	1 fluid ounce
Distilled Water Sulphuretted Hydrogen	...	of each a sufficiency.

Place the bromine in a glass cylinder and pour over it 15 ounces of the water. Pass a current of sulphuretted hydrogen gas into the bromine until the red colour of the aqueous liquid has disappeared. Filter the fluid, and distil the filtrate. Reject the distillate until it is free from the odour of sulphuretted compounds, and then collect it until sulphuric acid begins to distil. Dilute the distilled acid with water until it has a specific gravity at 60° F. of 1·077.

$$5Br_2 + 2H_2S + 4H_2O = 10HBr + H_2SO_4 + S.$$

From the rejected distillate more hydrobromic acid may be obtained by redistillation. A small quantity of bromide of sulphur is formed.

The above is a modification of Fletcher's process.

Fothergill's hydrobromic acid is prepared by adding solution of tartaric acid to an alcoholic solution of bromide of potassium.

$$KBr + H_2C_4H_4O_6 = HBr + KHC_4H_4O_6.$$

When prepared by this process it contains acid tartrate of potassium as an impurity. The use of the spirit is to precipitate as much as possible of the acid tartrate of potassium. On keeping, it invariably becomes discoloured, owing to the action of the acid on the tartrate. The acid tartrate of potassium is frequently found crystallised on the side of the bottle. The present official acid is much stronger than Fothergill's and more stable.

Hydrobromic acid may also be obtained by decomposing bromide of phosphorus with water.

$$PBr_5 + 4H_2O = 5HBr + H_3PO_4.$$

Bromide of phosphorus is obtained by dissolving bromine and phosphorus in bisulphide of carbon and evaporating off the latter.

The usual method is to heat together bromine, amorphous phosphorus, and particles of moistened glass, and then separate the acids by distillation. This is considered to be the best process.

The object of using the glass is to separate the bromine and phosphorus and so prevent them acting too violently upon each other.

Squibb's process consists in decomposing bromide of potassium with sulphuric acid, separating the sulphate of potassium formed by crystallisation, and subsequently distilling the mother liquor, in order to obtain a solution of hydrobromic acid free from impurities.

$$2KBr + H_2SO_4 = K_2SO_4 + 2HBr.$$

The easiest method of preparing hydrobromic acid is to decompose bromide of barium with a 5 or 10 per cent. solution of sulphuric acid.

$$BaBr_2 + H_2SO_4 = BaSO_4 + 2HBr.$$

Hydrobromic acid is a colourless, inodorous liquid, having a sour taste and acid reaction. Evaporated to dryness, it leaves little or no residue. Chlorine water liberates bromine, colouring the fluid yellow. With nitrate of silver it yields a yellowish-white curdy precipitate insoluble in nitric acid, and only sparingly soluble in solution of ammonia; no precipitate with chloride of barium; and does not become discoloured on keeping. 810 grains by weight require for neutralization 1000 grain measures of the volumetric solution of soda.

Dose.—15 to 50 minims.

Acidum Hydrochloricum. HCl.

Hydrochloric Acid.

Synonyms:—Muriatic Acid; Spirits of Salt.

This is a solution of hydrochloric acid gas in water, in which form it is official in the British Pharmacopœia. The solution contains 32 per cent. by weight of the gas.

When the liquid is exposed to the air it produces white fumes, which are due to the invisible hydrochloric acid gas dissolving in the moisture of the air.

Officially it is ordered to be prepared by distilling *dried* chloride of sodium with dilute sulphuric acid. The hydrochloric acid gas as it passes over is conducted through a wash bottle into a second bottle containing distilled water, until it acquires a specific gravity of 1·16:—

$$NaCl + H_2SO_4 = HCl + NaHSO_4;$$
$$\text{Or, } 2NaCl + H_2SO_4 = 2HCl + Na_2SO_4.$$

The residue left in the retort is either sulphate of sodium or acid sulphate of sodium, according to the amount of sulphuric acid used.

In the official process the acid sulphate is formed, which,

when neutralized with carbonate of sodium, forms the official sulphate of sodium.

$$2NaHSO_4 + Na_2CO_3 = 2Na_2SO_4 + H_2O + CO_2.$$

Excess of sulphuric acid is generally used, for two reasons. First, the hydrochloric acid gas comes off at a much lower temperature; and secondly, the acid sulphate of sodium, being more soluble in water than the normal sulphate, is more easily removed from the retort.

The chloride of sodium is ordered to be dried, so that a proper proportion of it may be used.

Water will absorb about 418 times its volume of hydrochloric acid gas.

The common yellow acid of commerce is a by-product in the manufacture of carbonate of sodium from common salt, and is frequently contaminated with iron, arsenic, free chlorine, sulphuric, sulphurous, and nitric acids.

It may be purified by diluting it to the density of 1·1 and redistilling.

Preparations containing free Hydrochloric Acid :

Acidum Hydrochloricum Dilutum.
,, Nitro-hydrochloricum Dilutum.
Liquor Antimonii Chloridi.
,, Arsenici Hydrochloricus.
,, Morphinæ Hydrochloratis.
,, Strychninæ Hydrochloratis.

The following are the tests for absence of impurities :—

1. Does not dissolve gold leaf	Indicating absence of free chlorine.	
2. If on diluting with four times its volume of water, solution of chloride of barium gives no precipitate	,, ,,	sulphuric acid.
3. Sulphuretted hydrogen, no precipitate	,, ,,	metals.
4. When boiled with bright copper, no tarnishing takes place	,, ,,	arsenic.

Sulphurous acid may be detected by the same tests as applied to *Acidum Aceticum*.

The Pharmacopœia orders the strong acid to be diluted with four times its volume of water before adding the chloride of barium, in consequence of the latter being insoluble in strong acids.

To prove whether the precipitate, if any, is sulphate of barium, or simply chloride of barium, the addition of a large quantity of water will dissolve the chloride but not the sulphate.

Its strength is determined by its volumetric estimation. 114·8 grains by weight require 1000 grain measures of solution of soda for neutralisation.

Acidum Hydrochloricum Dilutum.

Diluted Hydrochloric Acid.

Hydrochloric acid 8 fluid ounces, water a sufficiency, so that at a temperature of 60° F. it shall measure $26\frac{1}{2}$ fluid ounces. Sp. gr. 1·052.

The solubility of a gas depends upon the temperature.

Dose.—10 to 30 minims.

Acidum Hydrocyanicum Dilutum. HCN.

Diluted Hydrocyanic Acid.

Synonym :—Prussic Acid.

It is prepared officially by distilling ferrocyanide of potassium with diluted sulphuric acid, the distillation being carried on until a given amount has passed over into the re-

ceiver: water being added, so as to reduce it to the required strength.

The change is represented by the equation—

$$2K_4FeC_6N_6 + 6H_2SO_4 = FeK_2FeC_6N_6 + 6KHSO_4 + 6HCN.$$

There is left in the retort acid sulphate of potassium in solution, and an insoluble pale greenish salt (Everett's salt), which rapidly becomes blue when exposed to the air, due to oxidation.

It is necessary that the sulphuric acid be well diluted, or carbonic oxide will be evolved in place of hydrocyanic acid.

$$K_4FeC_6N_6 + 6H_2SO_4 + 6H_2O = FeSO_4 + 2K_2SO_4 + 3(NH_4)_2SO_4 + 6CO.$$

It should give no precipitate with barium chloride (absence of sulphuric acid). It has a sp. gr. of ·997. Its sp. gr. does not afford sufficient test to indicate its strength. Its strength is estimated volumetrically as follows:—270 grains of it, to which solution of litmus is added, the fluid being rendered alkaline by the addition of solution of soda, and maintained faintly alkaline throughout the operation, require 1000 grain-measures of the volumetric solution of nitrate of silver to be added, before a permanent precipitate begins to form, which corresponds to 2 per cent. of the real acid, HCN.

On treating it with a mixed solution of sulphate and persulphate of iron, subsequently with caustic potash, and finally acidulating with hydrochloric acid, Prussian blue is formed.

Dose.—2 to 8 minims.

A much stronger acid is made, known as Scheele's acid, which varies in strength, usually containing from 4 to 5 per cent. of HCN.

This acid is prepared by boiling Prussian blue with water and mercuric oxide until the blue colour disappears. During the operation mercuric cyanide is formed, which dissolves in the water, ferric oxide being deposited. The latter is filtered out, and the solution mixed with dilute sulphuric acid and shaken with iron filings, which precipitates metallic mercury, leaving sulphate of iron and hydrocyanic acid in solution; the latter is then distilled off.

$$Fe_4 3FeC_6N_6 + 9HgO = 2Fe_2O_3 + 3FeO + 9Hg2CN.$$
$$Hg2CN + Fe + H_2SO_4 = Hg + FeSO_4 + 2HCN.$$

PURE ANHYDROUS HYDROCYANIC ACID is prepared by passing sulphuretted hydrogen over mercuric cyanide.

$$Hg2CN + H_2S = HgS + 2HCN.$$

It may be obtained by warming crystals of mercuric cyanide with hydrochloric acid gas.

$$Hg2CN + 2HCl = HgCl_2 + 2HCN.$$

Hydrocyanic acid is a colourless highly volatile liquid, which evaporates so rapidly, when exposed to the air, that it lowers the temperature to the freezing point.

When cooled to a very low temperature it solidifies. If kept for some time it undergoes decomposition, evolving ammonia, and depositing a brown mass of formate of ammonium, but the presence of a very small quantity of sulphuric acid or glycerine will prevent this change.

The more dilute the hydrocyanic acid is, the better it will keep. The official 2 per cent. solution is fairly stable.

It should be kept in well-stoppered bottles, covered with impervious tissue; and the bottles should be inverted when not in use, and kept in a dark place.

Acidum Lacticum. $HC_3H_5O_3$.

Lactic Acid.

Contains about 25 per cent. of water, and is produced by the action of a peculiar ferment (Bacterium Lactis) on solution of sugar and subsequent purification of the product.

This acid is the most abundant of the products of the lactic fermentation. For the formation of the acid, a mixture of grape sugar or cane sugar, with chalk or oxide of zinc and water, is fermented with sour cheese at a temperature of about 80° F. for three or four weeks; at the end of this period the lactate formed is split up with dilute sulphuric acid, then separated from the sulphate formed, the mother-liquor partially distilled to drive off butyric acid, and the lactic acid then dissolved out with alcohol and ether, and evaporated until the proper specific gravity is obtained.

Lactic acid is a colourless syrupy liquid, inodorous, with a pure acid taste, and acid reaction on litmus. Specific gravity 1·21. Miscible in all proportions with water, rectified spirit, or ether, nearly insoluble in chloroform. Warmed with permanganate of potassium, it gives the odour of aldehyd. It vaporises when heated, and yields inflammable gases (CO, &c.), when the temperature is about 350° F., at first burning with a blue flame which becomes more luminous as the temperature rises. When nearly all dissipated, the residue chars, and finally almost entirely disappears (*absence of fixed impurities*). A solution in about ten parts of water, neutralized by ammonia, is not precipitated by sulphydrate of ammonium (*absence of zinc*). Not more than a faint opalescence is produced with chloride of barium (*absence of sulphates*), nitrate of silver (*absence of chlorides*), or oxalate of ammonium (*absence of calcium*); nor when boiled with excess of Fehling's solution is any precipitate formed (*absence of sugar*).

Used in the preparation of Acidum Lacticum Dilutum.

Acidum Lacticum Dilutum.

Diluted Lactic Acid.

Lactic Acid	...	3 fluid ounces
Distilled Water	...	sufficient to produce 1 pint.

(15 *fluid parts in* 100.)

Dose.—$\frac{1}{2}$ to 2 fluid drachms.

Acidum Meconicum. $H_3C_7HO_7$.

Meconic Acid.

An acid obtained from opium.

It may be prepared by suspending meconate of lead in water and decomposing it by means of a current of sulphuretted hydrogen, filtering the solution, concentrating the filtrate, and allowing to crystallise.

It occurs in micaceous crystals, nearly colourless, sparingly soluble in water, readily soluble in alcohol. The solution in water has a strongly acid taste and reaction, and is coloured red by neutral solution of perchloride of iron, the colour being discharged by strong but not by diluted hydrochloric acid. The aqueous solution gives no precipitate with solution of iodine and iodide of potassium, (*absence of organic bases*).

Used in the preparation of Liq. Morphinæ Bimeconates.

Acidum Nitricum. HNO_3

Nitric Acid.

Synonym :—Aqua Fortis.

Prepared by distilling dried nitrate of potassium, or nitrate of sodium, with an equal weight of concentrated

sulphuric acid. The nitric acid being volatile, distils over; acid sulphate of potassium or sodium remaining in the retort.

$$KNO_3 + H_2SO_4 = KHSO_4 + HNO_3.$$
$$NaNO_3 + H_2SO_4 = NaHSO_4 + HNO_3.$$

For commercial purposes, nitrate of sodium, called Chili saltpetre, is used (1) in consequence of its being cheaper; (2) it yields a larger percentage of nitric acid than nitrate of potassium.

Excess of sulphuric acid is used to form the acid sulphate, which, being more soluble than the normal sulphate, is more easily removed from the retort.

In the manufacture of nitric acid on the large scale, half the quantity of sulphuric acid is used, in order to form the normal sulphate; the glass retort being replaced by a cast-iron cylinder, it is picked out with chisels, thereby saving not only the excess of sulphuric acid, but also the carbonate of sodium, which would otherwise be required to neutralize the acid sulphate of sodium.

The official nitric acid of the British Pharmacopœia has a sp. gr. of 1·42, which is the most stable of all the solutions of this acid, and contains 70 per cent. by weight of nitric acid, corresponding to 60 per cent. of nitric anhydride N_2O_5. As the nitric acid distils over it has a yellow colour, due to the presence of peroxide of nitrogen.

To concentrate the acid it should be redistilled with its own volume of concentrated sulphuric acid.

As thus prepared it contains from 99 to 99·8 per cent. of the anhydrous acid, and is called fuming nitric acid, having a sp. gr. of 1·5.

Nitric acid is a colourless liquid fuming strongly when brought in contact with air.

When concentrated nitric acid is mixed with water heat is produced, and contraction in bulk occurs, due to the formation of a definite hydrous compound.

It is liable to contain traces of hydrochloric and sulphuric acids, which may be detected by means of nitrate of silver and chloride of barium.

When applying the Pharmacopœia to nitric acid tests it should be diluted with water, owing to the strong acid dissolving appreciable traces of sulphates and chlorides. The dark coloration which is communicated to the nitric acid on the addition of a solution of sulphate of iron is due to the presence of a molecular compound, formed by the action of nitric oxide on the sulphate of iron during the conversion of the latter salt into persulphate.

$$6FeSO_4 + 8HNO_3 = 2Fe_23SO_4 + Fe_26NO_3 + 2NO + 4H_2O.$$

If nitric acid is poured over copper filings, dense red vapours are immediately formed; but if the acid be mixed with an equal volume of water, and then added to the copper, it gives off a colourless gas, which acquires an orange-red colour as it mixes with the air.

Preparations containing free Nitric Acid.

Acid. Nit. Dil.; Acid. Nitro-hydrochlor. Dil.; Liq. Ferri Pernit.; Liq. Hydrargyri Nitratis Acidus; and Ung. Hydrargyri Nitratis.

Acidum Nitricum Dilutum.

Diluted Nitric Acid.

Nitric Acid	...	...	6 fluid ounces
Distilled Water	...	...	a sufficiency.

Dilute the acid with 24 fluid ounces of the water, then add more water, so that at a temperature of 60° F. it shall measure 31 fluid ounces. Specific gravity 1·101.

Dose.—10 to 30 minims.

Acidum Nitro-Hydrochloricum Dilutum.

Diluted Nitro-hydrochloric Acid.

Contains free chlorine, hydrochloric, nitric, and nitrous acids, and other compounds, dissolved in water.

Nitric Acid	...	...	3 fluid ounces
Hydrochloric Acid	...	...	4 fluid ounces
Distilled Water	...	...	25 fluid ounces.

Add the acids to the water and keep the mixture in a glass-stoppered bottle for 14 days before it is used.

The decomposition is supposed to take place according to the following equation, but it is undoubtedly far more complicated.

$$2HNO_3 + 6HCl = 2NOCl_2 + Cl_2 + 4H_2O.$$
$$2NOCl_2 + 3H_2O = HNO_3 + HNO_2 + 4HCl.$$

When nitric and hydrochloric acids are mixed, chlorine and chloronitrous acid are set free, which, in the presence of water, produce hydrochloric and nitric acids; after standing 14 days, the dilute acid contains the full amount of chlorine.

The process adopted in the Pharmacopœia (1867) consisted in mixing the strong acids, allowing them to stand for 24 hours and then diluting with water. The same decompositions took place, but during the 24 hours it was allowed to stand the bulk of the chlorine and chloronitrous acid was given off.

Acidum Oleicum. $HC_{18}H_{33}O_2$.

Oleic Acid.

A fluid fatty acid, obtained by the saponification of olein, or by the action of superheated steam on fats, with sub-

sequent separation from solid fats by pressure. Usually not quite pure.

Olive or almond oil is saponified with potash, the soap decomposed with tartaric acid, and the separated fatty acid, after being washed, is heated for some hours in a water bath with half its weight of litharge (PbO), the mixture is then shaken up with ether, which dissolves the oleate of lead, leaving any stearate of lead insoluble; the liquid, after standing for some time, is decanted and mixed with hydrochloric acid. The oleic acid liberated, dissolves in the ether and rises to the surface; this is decanted, mixed with water, and freed from ether by distillation.

$$3KHO + C_3H_5 3C_{18}H_{33}O_2 = 3KC_{18}H_{33}O_2 + C_3H_5 3HO.$$
$$2KC_{18}H_{33}O_2 + H_2C_4H_4O_6 = K_2C_4H_4O_6 + 2HC_{18}H_{33}O_2$$
$$2HC_{18}H_{33}O_2 + PbO = Pb2C_{18}H_{33}O_2 + H_2O.$$
$$Pb2C_{18}H_{33}O_2 + 2HCl = 2HC_{18}H_{33}O_2 + PbCl_2.$$

Oleic acid is obtained commercially by decolorizing palm oil with solution of bichromate of potash. The decolorised oil is then treated with superheated steam, which forms oleic and palmitic acids and glycerine. The fatty acids rise to the surface. These are skimmed off and pressed in horsehair bags. The fluid portion constitutes crude oleic acid, which is purified by boiling it with oxide of lead and treating it with ether (*to remove any oleate of lead which may be formed*), and finally decomposing the oleate of lead with dilute sulphuric acid.

Olein is the fluid constituent of most natural fats and fixed oils; chemically it is oleate of glyceryl.

Oleic acid is a straw-coloured liquid, nearly odourless and tasteless, and with not more than a very faint acid reaction. Unduly exposed to air it becomes brown and decidedly acid. Specific gravity ·860 to ·890. It is insoluble in water, but readily soluble in alcohol, chloroform, and ether. At 40° to 41° F. it becomes semi-solid, melting again at 56° to 60° F. It should be completely saponified when warmed with carbonate of potassium, and an aqueous solution of

this salt neutralised by acetic acid and treated with acetate of lead should yield a precipitate which, after washing with boiling water, is almost entirely soluble in ether.

Palmitate and stearate of lead are insoluble in ether, consequently the test is to indicate the presence or absence of palmitic and stearic acids.

Preparations containing Oleates and Oleic Acid.

Oleatum Hydrargyri.
Oleatum Zinci.
Unguentum Zinci Oleati.

Acidum Phosphoricum Concentratum.

Concentrated Phosphoric Acid.

Synonym :—Syrupy Phosphoric Acid.

Phosphoric acid, H_3PO_4, with 33·7 per cent. of water.

Officially it is prepared by boiling 413 grains of phosphorus (*in small pieces*), with 6 fluid ounces of nitric acid diluted with 8 fluid ounces of water, having an efficient condenser attached to the flask (*to condense the vapour of any nitric acid and water which distil over*), and evaporating the solution down to 4 fluid ounces. Then further evaporating to 2 ounces in a *platinum* vessel (*if a porcelain vessel were used, the acid, when strong enough, would attack the glaze and dissolve out a certain amount of the lead contained therein*), or until orange-coloured vapours are no longer formed. The residue is mixed with distilled water until, when cold, it measures 3 ounces and has a sp. gr. of 1·5. The oxygen of the nitric acid unites with the phosphorus to form phosphoric and phosphorous acids, nitric oxide gas being given off. A portion of the water distils over, which returns into the retort in order to keep the nitric acid from becoming too strong and oxidising the phosphorus with explosive rapidity.

$$3P_4+20HNO_3+8H_2O=12H_3PO_4+20NO.$$

During the concentration of the mixture the phosphorous acid is converted into phosphoric acid by means of the free nitric acid which remains in the mixture. Excess of nitric acid is got rid of in the second evaporation.

If strong nitric acid were used an explosion might result, due to the too rapid oxidation of the phosphorus.

If the acid be too dilute, phosphorous acid will be formed, the presence of which may be detected by boiling a little of the acid with its own volume of solution of perchloride of mercury, when a precipitate will be produced, due to the reduction of the mercuric salt to the mercurous state.

$$2HgCl_2+H_2O+H_3PO_3=2HgCl+2HCl+H_3PO_4.$$

By the action of heat phosphoric acid first loses water, and is converted at a temperature of 392° F. into pyrophosphoric acid, and then into metaphosphoric acid, or *Glacial phosphoric acid* as it is often called.

It should not give any precipitate with sulphuretted hydrogen, chloride of barium, nitrate of silver, or albumen, indicating absence of metals, sulphuric acid, hydrochloric acid, and metaphosphoric acid.

Its strength is estimated by the amount of anhydrous phosphate of lead formed by heating 73·8 grains with 180 grains of oxide of lead, it should leave 215·5 grains.

Dose—2 to 5 minims.

Phosphoric acid may also be prepared from phosphorus by treatment of the product of atmospheric oxidation with water and a little nitric acid.

$$2P_2O_3+6H_2O=4H_3PO_3.$$
$$3H_3PO_3+2HNO_3=3H_3PO_4+2NO+H_2O.$$

Acidum Phosphoricum Dilutum.

Diluted Phosphoric Acid

This is a solution containing 13·8 per cent. by weight of phosphoric acid H_3PO_4, corresponding to 10 per cent. of phosphoric anhydride, P_2O_5.

Prepared by mixing 3 fluid ounces of concentrated phosphoric acid with sufficient distilled water to make 20 fluid ounces.

Dose—10 to 30 minims.

Acidum Salicylicum. $HC_7H_5O_3$.

Salicylic Acid.

Salicylic acid is found in the form of an ethereal salt of methyl, in the oil of winter green, prepared from the blossoms of Gaultheria procumbens.

It is prepared in several ways.

1. Dissolve carbolic acid in an equivalent quantity of caustic soda, evaporate to dryness, powder the salt and put it into a flask, and pass dry carbon dioxide over it. Heat at first to 100° C., and then gradually let the temperature rise to 180° C.; finally heat to 250° C.; after cooling, dissolve the mass in water and add hydrochloric acid. Salicylic acid will separate. Recrystallise from water.

2. Saponify methyl salicylate found in the oil of winter green with caustic potash, acidify with hydrochloric acid. Filter off, the salicylic acid which separates, is collected, and recrystallised from water.

It occurs in white acicular crystals, inodorous but light and easily diffused and then irritating to the nostrils; taste at first sweetish, then acid. It is soluble in 500 to 700 parts of water at ordinary temperatures; readily soluble in alcohol, ether, and hot water; soluble also in solutions of

citrate or acetate of ammonium, phosphate of sodium, or borax. The crystals melt at about 311° F., and below 392° F. volatilise without decomposition. The aqueous solution gives with solution of perchloride of iron a reddish-violet colour.

Dose—5 to 30 grains.

Used in the preparation of Ung. acidi salicylici and Sodii salicylas.

Acidum Sulphuricum, H_2SO_4.

Sulphuric Acid.

Synonym :—Oil of Vitriol.

An acid produced by the combustion of sulphur and the oxidation and hydration of the resulting sulphurous acid gas by means of nitrous and aqueous vapours. It contains about 98 per cent. by weight of real sulphuric acid. Sp. gr. 1·843.

Until within the last few years, sulphuric acid was prepared solely from sulphur obtained from Sicily.

It is now manufactured chiefly from iron and copper pyrites. That obtained from native sulphur yields the purest acid.

The sulphur, or sulphur pyrites, is burnt in kilns, when the sulphur is converted into sulphurous anhydride (SO_2). The supply is kept up by placing a new charge on the top of that nearly burnt out.

The sulphurous anhydride (SO_2), together with air, which enters the kilns by a door carefully regulated, is drawn from the kilns by the draught from a tall chimney, and made to pass through a vessel in which nitric acid is generated ; from this they pass in at the bottom of an upright brick shaft, lined with lead and fire-brick, and partly filled with pieces of flint, known as Glover's Tower, or denitrating tower.

At the top of this tower are placed two reservoirs, one containing strong sulphuric acid saturated with nitrous fumes, the other weak chamber acid.

These two acids are allowed to flow down the tower together over the flint, in given proportions, the nitrous fumes contained in the strong acid are evolved when the acid becomes diluted, and are carried away together with the gases from the kilns into the chambers.

Another advantage of the Glover's tower is the concentration of the chamber acid, and the cooling of the intensely heated gases before they enter the chambers, thus preventing them from attacking the lead. The diluted acid, by the heat of the gases, parts with a large quantity of its water, which goes into the chamber as steam, whilst the concentrated acid, falling to the bottom of the tower, flows into a reservoir placed to receive it.

The fumes having been cooled by the chamber acid to about 75° F., pass on from the Glover's tower into the first chamber.

The nitric acid, which acts as a carrier of atmospheric oxygen, is generated by the action of sulphuric acid on nitrate of sodium.

$$NaNO_3 + H_2SO_4 = NaHSO_4 + HNO_3.$$

The acid sulphate of sodium is run off at intervals, and a new charge introduced into the generator. The heat from the kilns accelerates the decomposition of the nitrate of sodium.

In the first chamber are contained steam, nitrous fumes, sulphurous anhydride, and air. It is here that the reaction takes place.

The sulphur dioxide (SO_2), in the presence of steam, forms sulphurous acid.

$$SO_2 + H_2O = H_2SO_3.$$

This, in combination with nitrous anhydride, or nitric peroxide, forms sulphuric acid and nitric oxide.

$$NO_2 + H_2SO_3 = H_2SO_4 + NO, \text{ or}$$
$$N_2O_3 + H_2SO_3 = H_2SO_4 + 2NO.$$

The nitric oxide, the moment it is formed, combines with the free oxygen of the air and is reconverted into nitric peroxide.

$$NO + O = NO_2.$$

The nitric oxide therefore acts as a carrier between the oxygen of the air in the chamber and the sulphurous anhydride, so that, theoretically, a very small quantity of nitric acid would suffice to convert an indefinite quantity of sulphurous acid into sulphuric acid, but practically, this is not so; the enormous amount of nitrogen which accumulates in the chamber from the air used, has to be removed, and in its removal it carries away mechanically some of the nitrous fumes with it, most of which, however, are recovered and used over again.

From the first chamber the gases are made to pass into a second chamber, where they also meet with jets of steam, and having deposited a further amount of sulphuric acid, which falls on the floor, they are drawn into a third or exhaust chamber, as it is termed; here, if the process be properly conducted, the whole of the sulphurous anhydride is converted into sulphuric acid, and red nitrous fumes should be visible.

In order to absorb the nitrous fumes from the last chamber, a large tower, known as Gay-Lussac's tower, is used; this is similar in structure to Glover's tower, and is filled with coke. The gases are drawn in at the bottom, and escape into the chimney by the exit-tube near the top. At the top of the tower is a reservoir of concentrated chamber acid. As the fumes ascend the tower they meet with a finely divided shower of this strong acid, which in its descent absorbs the nitrous fumes, which would otherwise pass away up the chimney. The strong acid saturated with nitrous fumes flows into cisterns placed at the bottom to receive it, and thence is forced up to the top of Glover's tower, to be denitrated as previously described.

When the sp. gr. of the acid in the chambers reaches 1·55 the process is stopped. If carried beyond this stage it would begin to absorb the nitrous fumes.

In order to obtain a stronger acid, the Glover's tower is used, or where this is not available it is run into leaden pans, and evaporated until it acquires a sp. gr. of 1·7. If continued beyond this degree it would begin to act upon the lead of the pan. This acid is known as B. O. V., or brown oil of vitriol, as it is coloured by the presence of small quantities of organic matter.

To concentrate it still further it must be heated in platinum or glass vessels. Most of the acid made in England is concentrated in vessels made of well-annealed glass, which hold about twenty gallons each. Each glass retort is placed on a sand bath, round which the flames from a fire are allowed to play.

After the concentration is complete the acid is allowed to cool, and is drawn off by means of a leaden syphon into stone jars.

The acid thus prepared frequently contains sulphate of lead, from the action of the acid on the lead of the pans, and arsenic derived from the pyrites.

To free it from these it is allowed to flow down a tower up which sulphuretted hydrogen is made to pass. This converts the impurities into sulphides, which deposit at the bottom of the acid.

The acid used for the manufacture of aërated waters is made from the native sulphur, which contains no arsenic. The sulphur is burnt in a limited supply of air, which forms sulphur vapour and sulphur dioxide. These are made to pass into a tower filled with fire-bricks, a little air being admitted through the walls. On the top of the tower is placed a platinum still. The heat evolved from the combustion of sulphur vapour in an atmosphere of sulphur dioxide is immense, and serves to afford sufficient heat to evaporate the acid as it runs from the chambers into the platinum still.

Acidum Sulphuricum Dilutum.

Diluted Sulphuric Acid.

Is prepared by adding to distilled water 7 fluid ounces of strong sulphuric acid until the product, when cooled to 60° F., measures 83½ fluid ounces. Twelve minims contain one minim of strong sulphuric acid.

It contains 13·65 per cent. of real sulphuric acid. Sp. gr. 1·094.

Dose—5 to 30 minims.

If the water were added to the strong acid, the heat evolved would be very great and would probably break the vessel.

The condensation which takes place is due to a definite hydrate of sulphuric acid being formed.

The white precipitate sometimes formed on mixing strong sulphuric acid with water in sulphate of lead, which is soluble in strong sulphuric acid, but insoluble in dilute.

Used in the preparation of Infusum Rosæ Acidum.

Acidum Sulphuricum Aromaticum.

Aromatic Sulphuric Acid.

Strong Tincture of Ginger ...	2	fluid ounces
Spirit of Cinnamon	2	,, ,,
Rectified Spirit	36	,, ,,
Sulphuric Acid	3	,, ,,

Mix the sulphuric acid *gradually* with the spirit, and add the spirit of cinnamon and tincture of ginger.

If the sulphuric acid were added all at once to the spirit, great heat would be produced, which might break the vessel.

Sp. gr. ·911. It contains about 12·5 per cent. of real sulphuric acid.

The sp. gr. given in the Pharmacopœia is considered to be incorrect, and should be ·926.

This preparation is much lighter in colour than that prepared by the old process.

If this preparation were distilled ether would be formed.

Dose—5 to 30 minims.

Used in the preparation of Infusum Cinchonæ Acidum.

Acidum Sulphurosum. H_2SO_3.

Sulphurous Acid.

Sulphurous acid gas (SO_2) dissolved in water, and constituting, according to the Pharmacopœia, 5 per cent. by weight of the solution; equivalent to 6·4 per cent. of real sulphurous acid (H_2SO_3).

Prepared by heating together charcoal and sulphuric acid in a glass flask, allowing the evolved gases to pass through a wash bottle containing a small quantity of water, into a second bottle containing distilled water. The product should be adjusted to the required strength.

$$2H_2SO_4 + C_2 = 2H_2O + 2SO_2 + 2CO.$$
$$\text{or } 2H_2SO_4 + C = CO_2 + 2H_2O + 2SO_2$$
$$SO_2 + H_2O = H_2SO_3.$$

The 1867 Pharmacopœia prescribed a solution of an almost impracticable strength (9·2), and named a sp. gr. (1·04) that was not in accordance with the percentage strength.

The 5 per cent. solution ordered is convenient, and sufficiently strong for all medicinal purposes.

It is a colourless liquid, with a pungent sulphurous odour.

Sp. gr. 1·025. It gives but a very slight precipitate with chloride of barium, but a copious one if solution of chlorine be also added.

The chlorine oxidises the sulphurous acid to sulphuric acid.

$$H_2SO_3 + H_2O + Cl_2 = H_2SO_4 + 2HCl.$$

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Used in the preparation of Sodii sulphis.

Acidum Tannicum. $C_{27}H_{22}O_{17}$

Tannic Acid.

Synonym:—Tannin.

An acid extracted from galls. It may be obtained by the following process :—

Expose any convenient quantity of powered galls to a damp atmosphere for 2 or 3 days, and afterwards add sufficient ether to form a soft paste. Let this stand in a well-closed vessel for 24 hours, then, having quickly enveloped it in a linen cloth, submit it to strong pressure in a suitable press, so as to separate the liquid portion. Reduce the pressed cake to powder, mix it with sufficient ether, to which $\frac{1}{16}$ of its bulk of water has been added, to form again a soft paste, and press this as before. Mix the expressed liquids, and expose the mixture to spontaneous evaporation, until, by the aid subsequently of a little heat, it has acquired the consistence of a soft extract; then place it on earthern plates or dishes, and dry it in a hot-air chamber at a temperature not exceeding 212° F.

It occurs in pale yellow vesicular masses or thin glistening scales, with a strongly astringent taste, and an acid reaction; readily soluble in water and rectified spirit, very sparingly soluble in ether. The aqueous solution precipitates solution of gelatine yellowish white, and the persalts of iron of a bluish-black colour. It leaves no residue when burned with free access of air.

It is used commercially for dyeing purposes, and in the manufacture of ink.

Dose—2 to 10 grains.

Used in the preparation of Glycerinum Acidi Tannici; Suppositoria Acidi Tannici; Sup. Acid Tannici cum Sapone; and Trochisci Acidi Tannici

Acidum Tartaricum. $H_2C_4H_4O_6$.

Tartaric Acid.

An acid prepared from acid tartrate of potassium. The following is the official process : —

Acid Tartrate of Potassium	...	...	45 ounces
Distilled Water	...	...	a sufficiency
Prepared Chalk	...	...	$12\frac{1}{2}$ ounces
Chloride of Calcium	...	...	$13\frac{1}{2}$ ounces
Sulphuric Acid...	...	...	13 fluid ounces.

Boil the acid tartrate of potassium with two gallons of the water, and add gradually the chalk, constantly stirring. When the effervescence has ceased, add the chloride of calcium dissolved in two pints of the water. When the tartrate of calcium has subsided, pour off the liquid, and wash the precipitate with distilled water until it is rendered tasteless. Pour the sulphuric acid, first diluted with three pints of the water, on the tartrate of calcium, mix thoroughly, boil for half an hour with repeated stirring, and filter through calico. Evaporate the filtrate at a low temperature until it acquires the specific gravity of 1·21, allow it to cool, and then separate and reject the crystals of sulphate of calcium which have formed. Again evaporate the clear liquor till a film forms on its surface, and allow it to cool and crystallise. Lastly, purify the crystals by solution, filtration (if necessary), and recrystallisation.

It occurs in colourless crystals, the primary form of which is the oblique rhombic prism. It has a strongly acid taste, and is readily soluble in less than its own weight of water and in less than three times its weight of rectified spirit. When to either solution, not too much diluted, a little acetate of potassium is added, a white crystalline precipitate is formed (*acid tartrate of potassium*).

Adeps Lanæ.

Wool Fat.

The purified cholesterin-fat of sheep's wool.

Characters and Tests.—A yellowish tenacious unctuous substance; almost inodorous; with a melting-point varying from 100° F. to 112° F.; readily soluble in ether and in chloroform, sparingly soluble in rectified spirit. Ten grains should dissolve almost completely in fourteen fluid drachms of boiling ethylic alcohol, the greater part separating in flocks on cooling. Ignited with free access of air, it burns, leaving but a trace of ash. Fifty grains dissolved in four fluid drachms of ether, and two drops of tincture of phenolphthaleïn added, should not require more than two grain-measures of volumetric solution of soda to produce a permanent red coloration. The solution in chloroform poured gently over the surface of sulphuric acid acquires a purple-red colour. Heated with solution of soda, no ammoniacal odour should be evolved.

Adeps Lanæ Hydrosus

Hydrous Wool Fat.

Wool Fat	7 ounces ...	or ...	70 parts.
Distilled Water	3 ounces ...	„ ...	30 parts.

Melt the wool fat in a warm mortar, stirring in the water gradually and thoroughly.

Characters and Tests.—Yellowish white; free from rancid odour. When heated it separates into an upper oily and lower aqueous layer. One hundred grains exposed over a water-bath until the weight is constant yields not less than seventy grains, which should answer to the tests for wool fat.

Preparation in which Hydrous Wool Fat is used.

Unguentum Conii.

Adeps Præparatus.

Prepared Lard.

Synonyms :—Axungia, Adeps Suillæ.

The purified internal fat of the abdomen of the hog, Sus scrofa.

It contains about 62 per cent. of oleine and 38 per cent. of stearine. The fat should be freely exposed to the air to deprive it of its odour, then cut into small pieces and beaten in a mortar to break up the membranous vesicles ; it should then be placed in a vessel surrounded by warm water, and a temperature not exceeding 130° F. applied, until the fat has melted and separated from the membranous matter. Finally, the melted fat should be strained through flannel.

Lard is a soft, white, fatty substance, melting at about 100° F. It should have no rancid odour, and should dissolve entirely in ether.

The water in which it has been boiled, and cooled, should give no precipitate with nitrate of silver, *indicating absence of chlorides* (*chloride of sodium*).

It frequently contains water, the amount of which may be estimated by heating a known weight on a sand bath, then cooling and weighing ; the loss corresponds to the quantity of water present.

Lard is apt to go rancid on keeping, and becomes mouldy if it contains water : it is the oleine which becomes rancid, the stearine does not.

If subjected to great pressure the greater portion of the oleine is separated and stearine remains.

Adeps Benzoatus.

Benzoated Lard.

Prepared by digesting 140 grains of benzoin in coarse

powder, in 1 pound of prepared lard, by the heat of a water bath for 2 hours, and straining.

This corresponds to 1 part of benzoin to 50 parts of lard.

The preserving properties of benzoin in benzoated lard is supposed by some to be due to the volatile oil it contains, but this can hardly be so, since the oil is dissipated by the heat; it is most probably due to traces of the resin, which is extracted by the fat along with the whole of the acid.

Æther. $(C_2H_5)_2O$.

Ether.

Synonym :—Sulphuric Ether.

A volatile liquid, containing not less than 92 per cent. by volume of pure ether. Sp. gr. ·735.

Prepared by distilling together 10 fluid ounces of sulphuric acid with 12 fluid ounces of rectified spirit, allowing more rectified spirit to flow from a vessel into the retort, in such quantity as to equal the bulk of the ether which distils over.

The process should be stopped when 42 fluid ounces have passed over.

The reason why the process is stopped at this stage is because all the spirit will have distilled over, and the water which is retained from the alcohol by the sulphuric acid will dilute it to such an extent that it is no longer capable of uniting with more alcohol to form sulphethylic acid.

The blackening which gradually takes place in the retort is due to secondary decomposition.

The impure ether is shaken up with a solution of chloride of calcium and lime, the light supernatant liquid poured off, and distilled.

Any ether and spirit retained by the chloride of calcium may be recovered by distillation.

The reaction is supposed to take place in two stages.

(1.) The alcohol and sulphuric acid react forming sulphethylic acid and water.

$$\underset{\text{Alcohol.}}{C_2H_5HO} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} = \underset{\text{Sulphethylic Acid.}}{C_2H_5HSO_4} + \underset{\text{Water.}}{H_2O}.$$

(2.) The sulphethylic acid then acting on more alcohol, produces ether and sulphuric acid.

$$\underset{\text{Alcohol.}}{C_2H_5HO} + \underset{\text{Sulphethylic Acid.}}{C_2H_5HSO_4} = \underset{\text{Ether.}}{(C_2H_5)_2O} + \underset{\text{Sulphuric Acid.}}{H_2SO_4}.$$

The sulphuric acid so produced then again acts on the alcohol flowing into the retort, as in the first part of the process.

If alcohol is not allowed to flow into the retort during the manufacture of ether, in a short time the sulphuric acid will get in excess of the alcohol, and form olefiant gas. This is due to the sulphuric acid (which has a great affinity for water) abstracting the elements of water from the alcohol.

C_2H_6O	Alcohol.
H_2O	Abstracted by the H_2SO_4.
C_2H_4	Olefiant gas.

As the sulphuric acid gets in still greater excess of the alcohol, oil of wine will distil over. Oil of wine consists of sulphate of ethyl and some hydrocarbons. It is official, being contained in Spiritus Ætheris Sulphurici Compositus (Hoffman's Anodyne).

The ether that distils over is purified by shaking it up with chloride of calcium and slaked lime; the chloride of calcium absorbs *water*, and the slaked lime absorbs any

sulphurous acid that may have been formed by the reduction of the sulphuric acid.

Thus purified it constitutes the official ether, and consists of ether with 8 per cent. of alcohol.

Dose—20 to 60 minims.

Æther Purus. $(C_2H_5)_2O$.

Pure Ether.

Synonym:—Oxide of Ethyl.

Ether, free from alcohol and water.

This is prepared by removing the 8 per cent. of alcohol from ordinary sulphuric ether by shaking it with water (which dissolves out the spirit), decanting the ether, and allowing it to stand in contact with chloride of calcium and freshly burnt lime for 24 hours, and then distilling (to remove the little water dissolved by the ether). Sp. gr. ·720.

The lime absorbs the water by slaking, and the chloride of calcium forms a molecular compound with the spirit and so prevents it distilling over.

Agitated with its own volume of water, it becomes reduced 10 per cent. in volume, owing to its absorption by the water.

When shaken with a fourth of its bulk of solution of iodide of potassium and a little starch paste, no blue colour is produced (*absence of hydrogen peroxide*).

Alcohol and water are detected in it by the specific gravity test.

Æther Aceticus. $C_2H_5C_2H_3O_2$.

Acetic Ether.

Synonym:—Acetate of Ethyl.

Acetic ether, or acetate of ethyl, ($C_2H_5C_2H_3O_2$) belongs to

the class of bodies called ethereal salts, which consist of acid radicals in combination with the alcohol radicals.

It is prepared by distilling a mixture of acetate of sodium, rectified spirit, and sulphuric acid.

To $32\frac{1}{4}$ fl. oz. of rectified spirit slowly add $32\frac{1}{2}$ fl. oz. of sulphuric acid, keeping the fluid cool, and when the product is cold, add 40 oz. of acetate of sodium, and mix thoroughly. Distil 45 fluid ounces. Digest the distillate with 6 oz. of freshly dried carbonate of potassium for 3 days in a stoppered bottle. Separate the ethereal fluid, and again distil, until all but about 4 fluid ounces has passed over. Preserve the resulting acetic ether in a well-closed bottle and in a cool place.

The acetate of sodium and sulphuric acid produce acetic acid.

$$2NaC_2H_3O_2 + H_2SO_4 = Na_2SO_4 + 2HC_2H_3O_2.$$

The acetic acid in the nascent state at once acts on the alcohol present, producing acetic ether.

$$C_2H_5HO + HC_2H_3O_2 = C_2H_5C_2H_3O_2 + H_2O.$$

The carbonate of potassium is used to remove any water and neutralise any free acid which may be present.

Acetic ether is a colourless liquid with an agreeable ethereal odour. Sp. gr. about ·900. Boiling point about 166° F. Soluble in all proportions in rectified spirit and in ether. One part, by weight, dissolves in about 10 parts of water at 60° F.

Impurities :—Ether and alcohol.

Dose—20 to 60 minims.

Used in the preparation of Liquor Epispasticus.

Alcohol Amylicum. $C_5H_{11}HO$.

Amylic Alcohol.

Synonym :—Fousel Oil ; Hydrate of Amyl.

Amylic alcohol is a liquid of oily consistence, containing a small proportion of other spirituous substances. It is 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 should be redistilled, and the product passing over at 253° to 260° F. be alone collected for use.

It is generally met with in common alcohol, when prepared by the conversion of starch (especially potato starch) into sugar, and of the sugar into alcohol. The amylic alcohol is separated from the common alcohol by fractional distillation ; it is obtained from the portion which distils over last. It is called fousel oil, the term oil being no doubt derived from its imperfect miscibility with water.

Sp. gr. ·818, sparingly soluble in water, but freely soluble in alcohol, ether, and essential oils.

Exposed to the air in contact with platinum-black, it slowly oxidises, yielding valerianic acid.

Valerianic acid bears the same relation to amylic alcohol that acetic acid does to common alcohol, and is oxidised in the same way.

Used in the preparation of Amyl Nitris and Sodii Valerianas.

Alcohol Ethylicum. C_2H_5HO.

Ethylic Alcohol.

Synonym :—Absolute Alcohol

Rectified Spirit	...	...	1 pint
Carbonate of Potassium, anhydrous			2 ounces
Chloride of Calcium, fused		...	a sufficiency.

Add the carbonate of potassium to the spirit in a stoppered bottle, and macerate for 24 hours with frequent agitation. Put the chloride of calcium into a covered crucible and subject it to a red heat for half-an-hour; then pour the fused salt on to a clean stone slab, cover it quickly with an inverted porcelain dish, and when it has congealed, break it up into small fragments, and enclose it in a dry stoppered bottle. Put one pound of this fused chloride of calcium into a flask, pour over it the spirit decanted from the carbonate of potassium, and closing the mouth of the flask with a cork, shake them together, and allow them to stand for 24 hours with repeated agitation. Then attaching a dry condenser closely connected with a receiver from which free access of air is excluded, and applying the flame of a lamp to the flask, distil about 2 fluid ounces, which should be returned to the flask, after which the distillation is to be continued until 15 fluid ounces have been recovered.

It is a colourless liquid, sp. gr. from ·797 to ·800, containing from 1 to 2 per cent. of water. It cannot be kept anhydrous unless it be kept out of contact with the air. It may be made absolutely pure by distilling it from anhydrous sulphate of copper.

It does not cause anhydrous sulphate of copper to assume a decided blue colour after the two have been well shaken together (*absence of water*).

It may contain traces of the salts used in purifying it. These would be detected by the sp. gr. test, which should not exceed ·800.

It should not turn turbid on the addition of water, indicating absence of oily or resinous impurities.

Used in the preparation of Chloroform and Liquor Sodii Ethylatis.

Amyl Nitris. $C_5H_{11}NO_2$.

Nitrite of Amyl.

Is a liquid produced by the action of nitric or nitrous acid on amylic alcohol, which volatilises between 262° and 270° F. It is an ethereal liquid of a yellowish colour and peculiar odour. Sp. gr. about ·880.

It is insoluble in water, but soluble in rectified spirit. It should be stored in hermetically sealed vessels, or in well-stoppered bottles, and in a cool dark place.

When added, drop by drop, to fused caustic potash, valerianate of potassium is formed.

Dose—$\frac{1}{2}$ to 1 minim. By inhalation, the vapour of 2 to 5 minims.

Aqua. H_2O

Water.

Natural water, the purest that can be obtained, cleared if necessary by filtration, free from odour, unusual taste, and visible impurity. To be used whenever "Water" is ordered in the British Pharmacopœia. In dispensing prescriptions, *aqua* should be understood to mean distilled water.

Water attains its greatest density at 4° C. or 39·2° F.; it boils at 212° F., and evaporates at all temperatures below that point; it freezes at 32° F.

The aromatic waters are frequently made by triturating an oil with magnesia or carbonate of magnesium, diluting with water and filtering. The great objection to using carbonate of magnesium in medicated waters is, that it is slightly soluble and would precipitate alkaloids or phosphates

from a mixture; it is also liable to cause more than the required quantity of oil to be dissolved.

A better way is to triturate the oil with a little pumice stone, which is totally insoluble in water.

A Water prepared by trituration with magnesia may be detected by rubbing a small portion of calomel in a mortar with a little of the Water; if magnesia be present the calomel is converted into black oxide of mercury.

Some of the official Waters often become viscous, albuminous, and useless. Waters so affected may be purified by shaking them with a little subnitrate of bismuth made into a paste with water, and allowing the Waters to stand to clarify.

Aqua Destillata. H_2O.

Distilled Water.

Purest water, distilled from a copper still, connected with a block-tin worm; the British Pharmacopœia orders 10 gallons to be distilled, the first half gallon to be rejected in consequence of it containing volatile matters (such as AMMONIA, CARBONIC ACID, &c.). In preparing distilled water by condensing steam the first portion is always allowed to escape. The last gallon and a half is retained in order to keep back earthly impurities, such as LIME, MAGNESIA, &c.

8 gallons only are collected.

If it were evaporated to dryness the chloride of magnesium contained in the ordinary water would be decomposed into oxide of magnesium and hydrochloric acid, the latter would distil over and spoil the water.

$$MgCl_2 + H_2O = MgO + 2HCl.$$

To detect organic matter, expose some of the water in a bottle, containing a little nitrate of silver, to the light; if

no darkening in colour takes place organic matter is absent. It may also be detected by shaking a portion of the water, acidulated with a little diluted sulphuric acid, with a few drops of solution of permanganate of potassium; if organic matter be present the colour is destroyed.

Water exposed to the air absorbs carbonic acid gas.

The following are the tests for the absence of impurities:—

Should leave no residue on evaporation.	Indicating absence of	fixed	impurities.
Should not be affected by oxalate of ammonium.	,,	,,	lime.
Should not be affected by nitrate of silver.	,,	,,	chlorides.
Should not be affected by chloride of barium.	,,	,,	sulphates.
Should not be affected by lime water.	,,	,,	carbonic acid.

Aromatic Waters.

All the waters of the Pharmacopœia are prepared by distillation with the exception of *camphor* and *chloroform*.

2 gallons of water are ordered to be used, in order to prevent charring in the still.

Ordinary water is used in these preparations, as the volatile matters (ammonia and carbonic acid gas) will not interfere with the product.

Table of Official Waters.

$\frac{1}{4}$ *gr. in* 1 *fl. oz.*
Aq. Camphoræ.

$1\frac{1}{2}$ *fl. dr. to* 1 *gallon.*
Aq. Menthæ Piperitæ.
,, ,, Viridis.

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14 *oz. to* 1 *gallon.*
Aq. Pimentæ.

---

20 *oz. to* 1 *gallon.*
Aq. Cinnamomi.

---

1 *fl. dr. to* 25 *fl. oz.*
Aq. Chloroformi.

1 *pound to* 1 *gallon.*
Aq. Anethi.
„ Anisi.
„ Carui.
„ Fœniculi.

1 *pound to* 1 *pint.*
Aq. Laurocerasi.

10 *pounds to* 1 *gallon.*
Aq. Rosæ.
„ Sambuci.

Aqua Anethi.

Dill Water.

Dill Fruit, bruised	...	...	...	1 pound
Water	...	...	...	2 gallons

Distil 1 gallon.

Aqua Anisi.

Anise Water.

Anise Fruit, bruised	...	...	...	1 pound
Water	...	...	...	2 gallons.

Distil 1 gallon.

Aqua Aurantii Floris.

Orange-flower Water.

Water distilled from the flowers of the Bitter Orange (Citrus vulgaris), and the Sweet Orange (Citrus Aurantium). The sulphuretted hydrogen test ordered in the Pharmacopœia is to detect copper or lead. The water is

sometimes imported in copper or leaden vessels, and as the water generally contains acetic acid, derived from the flowers, any oxide in the interior of the vessel is liable to be dissolved.

The Orange-flower Water of commerce is usually three times the strength of that employed in former years.

It is prepared mostly in France.

The bitter orange flowers yield by far the better water.

Used in the preparation of Syrupus Aurantii Floris.

Aqua Camphoræ.

Camphor Water.

Synonym:—Mistura Camphoræ.

Camphor, crushed	...	...	...	$\frac{1}{2}$ ounce
Distilled Water	...	...	...	1 gallon.

Enclose the camphor in a muslin bag, and attach this to a piece of glass, by means of which it may be kept at the bottom of a bottle containing the distilled water. Close the mouth of the bottle, macerate for at least two days, and then pour off the solution when it is required.

Dose—1 to 2 fluid ounces.

This is a saturated solution of camphor in distilled water. It contains about $\frac{1}{4}$ gr. in a fluid ounce. It is rather lighter than distilled water, due to the presence of the camphor, which has a lower specific gravity than that of water.

Used in the preparation of Injectio Apomorphinæ Hypodermica; Injectio Ergotini Hypodermica; and Liquor Atropinæ Sulphatis.

Aqua Carui.

Caraway Water.

Caraway Fruit, bruised	1 pound
Water	2 gallons.

Distil 1 gallon.

Aqua Chloroformi.

Chloroform Water.

Chloroform	1 fluid drachm
Distilled Water...	25 fluid ounces.

Put them in a two-pint stoppered bottle, and shake them together until the chloroform is entirely dissolved in the water.

Dose—$\frac{1}{2}$ to 2 fluid ounces.

(It contains about 1 minim in 200.)

Aqua Cinnamomi.

Cinnamon Water.

Cinnamon Bark, bruised	20 ounces
Water	2 gallons.

Distil 1 gallon.

That made by distillation from Ceylon cinnamon possesses a decidedly sweet taste, whilst that made by triturating the volatile oil with carbonate of magnesium is destitute of sweetness.

Used in the preparation of Mistura Cretæ; Mistura Guaiaci; and Mistura Spiritus Vini Gallici.

By keeping, it deposits crystals of cinnamic acid, caused by the oxidation of the volatile oil.

The turbidity of this water is due to the presence of essential oil.

Aqua Fœniculi.

Fennel Water.

Fennel Fruit, bruised	1 pound
Water	2 gallons.

Distil 1 gallon.

Aqua Laurocerasi.

Cherry-Laurel Water.

Fresh Leaves of Cherry-Laurel ...	1 pound
Water	$2\frac{1}{2}$ pints.

Chop the leaves, crush them in a mortar, introduce them with the water into a retort, and distil 1 pint of liquid. Shake the product, filter through paper, and adjust the strength of the finished product either by addition of hydrocyanic acid or by diluting the distillate with distilled water, so that 810 grains of it, tested as described in the process for diluted hydrocyanic acid, shall require 150 grain-measures of the volumetric solution of nitrate of silver to be added before a permanent precipitate begins to form, which corresponds to ·1 per cent. (or 1 in 1000) of real hydrocyanic acid.

It is $\frac{1}{20}$th the strength of the official hydrocyanic acid.

The reactions which take place in testing the strength of this water for hydrocyanic acid are as follows :—

On the addition of caustic soda, cyanide of sodium is formed.

$$HCy + NaHO = NaCy + H_2O.$$

Hydrocyanic Acid. Caustic Soda. Cyanide of Sodium. Water.

The nitrate of silver combines with the cyanide of sodium, forming a double cyanide of silver and sodium, which is soluble in water.

$$2NaCy + AgNO_3 = AgCyNaCy + NaNO_3.$$

Cyanide of Sodium. Nitrate of Silver. Double Cyanide of Silver and Sodium. Nitrate of Sodium.

On a further addition of nitrate of silver a permanent precipitate of cyanide of silver is formed.

$$AgCyNaCy + AgNO_3 = 2AgCy + NaNO_3.$$

Cyanide of Silver and Sodium. Nitrate of Silver. Cyanide of Silver. Nitrate of Sodium.

Laurel Water also contains essential oil of almonds.

In the Pharmacopœia of 1867 the leaves were ordered to be digested in water for 24 hours previous to distillation, to allow the substances present in the leaves to react and produce hydrocyanic acid and oil of almonds.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Aqua Menthæ Piperitæ.

Peppermint Water.

Oil of Peppermint	...	...	$1\frac{1}{2}$ fluid drachm
Water ...	...	...	$1\frac{1}{2}$ gallon.

Distil 1 gallon.

(It contains about 1 minim in 853, or $\frac{1}{2}$ minim in 1 fluid ounce.)

Used in the preparation of Mistura Ferri Aromatica.

Aqua Menthæ Viridis.

Spearmint Water.

Oil of Spearmint	1½ fluid drachm
Water	1½ gallon.

Distil 1 gallon.

Aqua Pimentæ.

Pimento Water.

Pimento, bruised	14 ounces
Water	2 gallons.

Distil 1 gallon.

Aqua Rosæ.

Rose Water.

Distilled from the fresh petals of the Rosa centifolia, or an equivalent quantity of the petals preserved, while fresh, with common salt.

(10 *pounds of rose petals to* 5 *gallons of water, distil* 1 *gallon.*)

Rose Water cannot be preserved with spirit, as the quantity required to keep it would interfere with its medicinal properties. It should be kept in well stoppered bottles and in a cool place.

Used in the preparation of Mistura Ferri Composita and Troschisci Bismuthi.

Aqua Sambuci.

Elder-flower Water.

Distilled from the fresh flowers of Sambucus niger, or an equivalent quantity of the flowers preserved, while fresh, with common salt.

(10 *pounds of flowers to* 5 *gallons of water, distil* 1 *gallon.*)

The quantity of water has been increased from 2 gallons to 5 gallons.

As it contains a large quantity of vegetable matter, it becomes acid, and its odour is impaired.

It is better to distil it of double strength, and dilute it when required.

Used as a perfume and vehicle for medicines.

Butyl-Chloral Hydras. $C_4H_5Cl_3O,H_2O$.

Hydrate of Butyl-Chloral.

Synonyms:—Hydrous Butyl-Chloral, erroneously termed Croton-Chloral Hydrate.

Butyl-chloral is produced by the action of dry chlorine gas on aldehyd cooled to a temperature of 14° F., separated by fractional distillation, and converted into the solid hydrous butyl-chloral by the addition of water.

$$2C_2H_4O + 2Cl_2 = C_4H_5Cl_3O + HCl + H_2O.$$
$$C_4H_5Cl_3O + H_2O = C_4H_5Cl_3O,H_2O.$$

It occurs in pearly white crystalline scales, having a pungent but not acid odour, resembling that of hydrous chloral, and an acrid nauseous taste. It fuses at about 172° F. to a transparent liquid, which, on cooling, commences to solidify

at about 160° F. Soluble in about 50 parts of water, in its own weight of glycerine and rectified spirit, and nearly insoluble in chloroform. The aqueous solution is neutral or but slightly acid to litmus paper. It does not yield chloroform when heated with solutions of potash or soda or with milk of lime.

Dose—5 to 15 grains.

Caffeina. $C_8H_{10}N_4O_2,H_2O$.

Caffeine.

Synonyms:—Caffeia ; Theina ; Guaranina.

An alkaloid usually obtained from the dried leaves of Camellia Thea, or the dried seeds of Coffea arabica, by evaporating aqueous infusions from which astringent and colouring matters have been removed.

Characters and Tests.—Colourless, silky, inodorous, acicular crystals. Soluble in 80 parts of cold water, the solution having a faintly bitter taste and being neutral to litmus. More soluble in boiling water and in rectified spirit, and very soluble in chloroform ; sparingly soluble in ether. At 212° F. (100° C.) the crystals lose 8·49 per cent. of their weight, and at a higher temperature melt and volatilise without decomposition. Treated with a crystal of chlorate of potassium and a few drops of hydrochloric acid, and the mixture evaporated to dryness in a porcelain dish, a reddish residue results, which becomes purple when moistened with ammonia. In an aqueous solution of the alkaloid, tannic acid gives a white precipitate, soluble in excess of the reagent.

Dose—1 to 5 grains.

Caffeinæ Citras. $C_8H_{10}N_4O_2,H_3C_6H_5O_7$

Citrate of Caffeine.

A weak compound of caffeine and citric acid.

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. Reduce to a fine powder.

Characters and Tests.—A white inodorous powder with an acid and faintly bitter taste and an acid reaction on litmus. It is soluble in a mixture of two parts of chloroform and one part of rectified spirit. With a little water it forms a clear syrupy solution, which on dilution yields a white precipitate of caffeine that redissolves when 10 parts of water have been added. Heated in the air the salt chars and burns, leaving a mere trace of ash. From a boiling aqueous solution excess of lime water gives a white precipitate. Tannic acid yields a white precipitate soluble in excess of the reagent. If to a little of the salt a crystal of chlorate of potassium be added, and a few drops of hydrochloric acid, and the mixture be evaporated to dryness in a porcelain dish, a reddish residue results, which becomes purple when moistened with solution of ammonia.

Dose—2 to 10 grains.

Cataplasmata.

Poultices.

Poultices are used for outward application, and generally have for their bases linseed meal.

Poultices are, as a rule, applied warm on muslin and covered with a piece of flannel to keep the heat in.

There are 6 in number, viz., Cataplasmata Carbonis, Conii, Fermenti, Lini, Sinapis, and Sodæ Chlorinatæ.

These are all made with linseed meal and boiling water, with the exception of yeast poultice.

Cataplasma Carbonis.

Charcoal Poultice.

Wood Charcoal, in powder ...	½ ounce
Crumb of Bread	2 ounces
Linseed Meal	1½ ounce
Boiling Water	10 fluid ounces.

Macerate the bread in the water for ten minutes near the fire, then mix, and add the linseed meal gradually, stirring the ingredients, that a soft poultice may be formed. Mix with this, half the charcoal, and sprinkle the remainder on the surface of the poultice.

As a rule thin muslin wrung out of hot water should be placed over the surface.

Cataplasma Conii.

Hemlock Poultice.

Juice of Hemlock	1 fluid ounce
Linseed Meal	4 ounces
Boiling Water	10 fluid ounces.

Evaporate the hemlock juice to half its volume, add this to the linseed meal and water previously mixed, and stir them together.

Hemlock juice is now substituted for the powdered leaves.

It is evaporated to get rid of the spirit contained in the juice.

Cataplasma Fermenti.

Yeast Poultice.

Beer Yeast	6 fluid ounces
Wheaten Flour	14 ounces
Water, heated to 100° F. ...	6 fluid ounces.

Mix the yeast with the water and stir in the flour Place the mass near the fire till it rises.

Heat is used to generate carbonic acid gas.

This poultice is used generally for foul ulcers.

If water at a higher temperature than 100° F. be used, fermentation will be entirely stopped. The active principle in this poultice is carbonic acid gas, which has a sedative effect.

Cataplasma Lini.

Linseed Poultice.

Linseed Meal	4 ounces
Boiling Water	10 fluid ounces.

Mix the linseed meal gradually with the water, with constant stirring.

The meal should be added to the water.

If the water be added to the meal, a lumpy product often results.

The meal containing the oil, known as crushed linseed, should alone be used.

The bruised seeds are sometimes used.

The old linseed poultice contained olive oil ; it is left out in the present Pharmacopœia, as the linseed meal now consists of the crushed seeds with the natural oil retained.

Cataplasma Sinapis.

Mustard Poultice.

Mustard, in powder	...	$2\frac{1}{2}$ ounces, or a sufficiency
Linseed Meal	...	$2\frac{1}{2}$ ounces
Boiling Water, Water	...	of each a sufficiency.

Mix the mustard with 2 to 3 ounces of lukewarm water; mix the linseed meal with 6 to 8 ounces of boiling water; add the former to the latter, and stir them together.

The directions for making this poultice have been altered from those given in the Pharmacopœia (1867).

By lukewarm water is meant water at a temperature of about 90 degrees.

It is ordered to be mixed with warm water to develop the oil more rapidly.

If boiling water were used, the active principle would be coagulated, and no volatile oil would be formed.

Cataplasma Sodæ Chlorinatæ.

Chlorine Poultice.

Solution of Chlorinated Soda	...	2 fluid ounces
Linseed Meal	...	4 ounces
Boiling Water	...	8 fluid ounces.

Mix the linseed meal gradually with the water, and add the solution of chlorinated soda, with constant stirring.

If the solution of chlorinated soda were added to the boiling water, it would be converted into chloride and chlorate of sodium.

Cera Flava.

Yellow Wax.

Prepared from the honeycomb of the Hive Bee, Apis mellifica.

Wax is secreted in glands placed on the ventral scales of the bee. With this wax the bees construct the comb. The substance called propolis is collected by the bees from the buds of trees. It is of a resinous nature, and is used for lining the cells of a new comb, stopping crevices, &c.

The comb, from which the honey has been allowed to drip, is first subjected to pressure. It is then melted in water, by which means the impurities subside, and the wax is poured into moulds and left to cool.

It is sometimes adulterated with suet, which gives it a fatty and disagreeable taste. Resin is frequently added to it, and may be detected by its solubility in cold alcohol; bean and pea meal, which are sometimes used as adulterants, may be detected by their insolubility in oil of turpentine.

Characters and Tests.—Firm, breaking with a granular fracture, yellowish, having an agreeable, honey-like odour. Not unctuous to the touch. Should be readily and entirely soluble in hot oil of turpentine. Should not yield more than three per cent. to cold rectified spirit, and nothing to water (*absence of soap*) or to a boiling solution of soda (*absence of fats or fatty acids*), the two latter fluids after filtration not being turbid nor yielding a precipitate on the addition of hydrochloric acid. Specific gravity ·950 to ·970. Melts at 146° F. when tested in the following manner. Liquefy a few grains, and draw a little of the fluid up into a capillary tube; fix a piece of the filled capillary tube to the bulb of a thermometer by thread; immerse the bulb and tube in a beaker of water and heat the latter gently; at the moment the opaque rod of wax becomes transparent, note the temperature. The solidifying point is two to three degrees lower than the melting point. Boiling water in which it has been agitated is not, when cooled, rendered blue by iodine.

In the Pharmacopœia, 1867, the melting point was given as 140° F., which was certainly too low.

Used chiefly as a basis for 6 official ointments and 5 plasters. It also enters into Pil. Phosphori.

Cera Alba.

White Wax.

Is yellow wax bleached by exposure to moisture, air, and light.

The bleaching is effected by melting yellow wax by means of steam, running it off while in the melted state into a trough called a cradle, perforated at the bottom with holes, and placed over a large water tank, at the end of which is a revolving cylinder almost wholly immersed in water. By this means the wax is solidified, converted into a kind of ribbon, and conveyed on the surface of the water to the other end of the tank. These ribbons of wax are here lifted out, and carried in baskets to the bleaching grounds, where they are exposed to the air for one or two weeks, being turned every day, and watered from time to time. The wax is then re-melted, re-ribboned, and re-bleached. It is subsequently refined by melting in water acidulated with sulphuric acid.

Spermaceti is frequently added to the circular cakes of commerce to improve the colour.

It should respond to the tests given under yellow wax.

Used in the preparation of Charta Epispastica, Unguentum Cetacei, and Unguentum Simplex.

Cerevisia Fermentum.

Beer Yeast.

A ferment obtained on brewing beer. This ferment is a minute unicellular fungoid vegetable (Saccharomyces cerevisiæ). There are at least two varieties of brewer's yeast produced during fermentation, viz., top yeast and bottom yeast. The first is the official form and is a viscid semifluid, frothy or spongy mass, and grows most rapidly at a temperature of 64° F. Yeast ceases to vegetate when the temperature falls below 40° F., but although it ceases to grow, it is not killed even if the temperature falls much

below zero; it also loses its vitality in the presence of water when the temperature rises to 170° F. Dry or German Yeast is obtained by removing the water by pressure.

Cetaceum.

Spermaceti.

A concrete fatty substance, obtained, mixed with oil, from the head of the Sperm Whale, Physeter Macrocephalus.

Preparation—The semifluid substance is removed from the head of the Whale, it is then drained in suitable bags and afterwards submitted to strong pressure to remove the oil; the pressed cake is now melted in warm water and any impurities removed, then boiled with a weak caustic soda solution and then washed with warm water; it is finally allowed to solidify in suitable vessels.

Characters and Tests.—Spermaceti is a pearly white translucent and crystalline substance, unctuous to the touch, having a mild bland taste, and a faint fatty odour; when melted it is perfectly neutral to litmus paper. It is readily reduced to powder when previously moistened with rectified spirit. It is soluble in ether, carbon bisulphide, chloroform, and boiling alcohol. Melting point 111° to 122° F.; Sp. gr. ·943 to ·945.

Impurities.—When Spermaceti becomes yellow and rancid it is due to imperfect removal of the oil. It should dissolve in 40 times its weight of boiling alcohol (*absence of fats*), and when cold the solution should not be acid in reaction (*absence of fatty acids*).

Used in the preparation of Charta Epispastica and Unguentum Cetacei.

Chartæ.

Two in number.

These are local applications for producing vesication.

Charta Epispastica.

Blistering Paper.

White Wax	4 ounces
Spermaceti	1½ ounce
Olive Oil	2 fluid ounces
Resin	¾ ounce
Canada Balsam...	¼ ounce
Cantharides, in powder ...	1 ounce
Distilled Water...	6 fluid ounces.

Digest all the ingredients, excepting the Canada balsam, in a water-bath for 2 hours, stirring them constantly, then strain, and separate the plaster from the watery liquid. Mix the Canada balsam with the plaster melted in a shallow vessel, and pass strips of paper over the surface of the hot liquid, so that one side of the paper shall receive a thin coating of plaster.

Ruled paper is often employed to indicate divisions, each of which is one square inch.

Charta Sinapis.

Mustard Paper.

Mustard, in powder	1 ounce
Solution of Gutta-Percha ...	2 fluid ounces, or a sufficiency.

Mix the mustard with the gutta-percha solution so as to form a semifluid mixture, and having poured this into a shallow flat-bottomed vessel, such as a dinner plate, pass strips of cartridge-paper over its surface so that one side of the paper shall receive a thin coating of the mixture. Then lay the paper on a table with the coated side upwards, and let it remain exposed to the air until the coating has hardened.

Before being applied to the skin, the mustard paper should be immersed for a few seconds in tepid water.

In preparing the Pharmacopœial mustard paper, the fatty oil is not removed from the seeds before using. This precaution is adopted in other Pharmacopœias, as the removal of the fatty oil prevents rancidity; petroleum, ether, or carbon disulphide readily removes the oil without extracting the active principles.

Several of the mustard papers of trade contain, besides mustard powder, an extract of Cayenne pepper.

Chloral Hydras. C_2HCl_3O,H_2O.

Hydrate of Chloral.

Synonym:—Hydrous Chloral.

Chloral is produced by the action of dry chlorine gas on anhydrous alcohol.

Chlorine gas, dried by allowing it to bubble through oil of vitriol, is passed into absolute alcohol so long as any absorption occurs. The alcohol is at first kept cool, but afterwards the temperature is gradually raised to the boiling point.

The impure product is mixed with 3 times its volume of sulphuric acid and distilled. The process is repeated and the product finally rectified from quicklime.

The chloral thus obtained is mixed with a small quantity of water, and allowed to crystallise.

$$\underset{\text{Alcohol.}}{C_2H_6O} + \underset{\text{Chlorine.}}{Cl_2} = \underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Hydrochloric Acid.}}{2HCl.}$$

$$\underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Chlorine.}}{3Cl_2} = \underset{\text{Chloral.}}{C_2HCl_3O} + \underset{\text{Hydrochloric Acid.}}{3HCl.}$$

$$\underset{\text{Chloral.}}{C_2HCl_3O} + \underset{\text{Water.}}{H_2O} = \underset{\text{Chloral Hydrate.}}{C_2HCl_3O,H_2O.}$$

From the above reactions it would appear that the chlorine displaces two atoms of hydrogen from the alcohol, forming hydrochloric acid and aldehyd; three atoms of the hydrogen of the aldehyd being afterwards replaced by

chlorine. But the reactions are far more complicated. Chloral hydrate occurs in colourless crystals, which do not deliquesce on exposure to air. It has a pungent but not an acrid odour, and a pungent and rather bitter taste. On the gentle application of heat it fuses to a colourless transparent liquid, which, as it cools, begins to solidify at a temperature of about 120° F. It boils in a test-tube, with pieces of broken glass immersed in it, at from 202° to 206° F., and at a slightly higher temperature it volatilises on platinum foil without residue. Soluble in less than its own weight of distilled water, rectified spirit, or ether, and in four times its weight of chloroform. The aqueous solution is neutral or but slightly acid to test-paper. A solution in chloroform, when mixed by agitation with sulphuric acid, does not impart colour to the acid. 100 grains of hydrate of chloral dissolved in an ounce of distilled water and mixed with 30 grains of slaked lime, submitted to careful distillation with a suitable apparatus, should yield not less than 70 grains of chloroform.

72 per cent. is actually formed, 2 per cent. of which is dissolved in the water.

Dose—5 to 30 grains.

Used in the preparation of Syrupus Chloral.

Chloroformum. $CHCl_3$.

Chloroform.

The following is the official process :—

Chlorinated-Lime	10 pounds
Rectified Spirit	30 fluid ounces
Slaked Lime	a sufficiency
Water	3 gallons
Sulphuric Acid	a sufficiency
Chloride of Calcium, in small fragments	2 ounces
Distilled Water	9 fluid ounces
Ethylic Alcohol	a sufficiency.

Place the water and the spirit in a capacious still, and raise the mixture to the temperature of 100° F. Add the chlorinated lime and 5 pounds of the slaked lime, mixing thoroughly. Connect the still with a condensing worm encompassed by cold water, and terminating in a narrow -necked receiver ; and apply heat so as to cause distillation, taking care to withdraw the fire the moment that the process is well established. When the distilled product measures 50 ounces, the receiver is to be withdrawn. Pour its contents into a gallon bottle half filled with water, mix well by shaking, and set at rest for a few minutes, when the mixture will separate into two strata of different densities. Let the lower stratum, which constitutes crude chloroform, be washed by agitating it in a bottle with three ounces of the distilled water. Allow the chloroform to subside, withdraw the water, and repeat the washing with the rest of the distilled water, in successive quantities of three ounces at a time. Agitate the washed chloroform for five minutes in a bottle with an equal volume of pure sulphuric acid, allow the mixture to settle, and transfer the upper stratum of liquid to a bottle containing a little alkaline water. After agitation transfer the chloroform to a dry bottle containing the chloride of calcium mixed with half an ounce of quick lime. Mix well by agitation. After the lapse of an hour decant the chloroform into a flask, connect the flask with a Liebig's condenser, and distil over the pure chloroform by means of a water-bath. Add 1 per cent. by weight of ethylic alcohol. Preserve the product in a cool place, in a bottle furnished with an accurately ground stopper.

The lighter liquid which floats on the crude chloroform after its agitation with water, and the washings with distilled water, is employed in a subsequent operation.

The exact reactions which take place are not known, but most probably they are as follows :—

1st. The alcohol of the rectified spirit induces the decomposition of the hypochloride of calcium, present in the chlorinated lime, into slaked lime, oxygen, and chlorine.

2nd. The oxygen then oxidises the alcohol to aldehyd.

$$C_2H_6O + O = C_2H_4O + H_2O.$$

3rd. The chlorine then acts on the aldehyd, forming chlor-aldehyd or chloral.

$$C_2H_4O + 3Cl_2 = C_2HCl_3O + 3HCl.$$

4th. The chloral and some of the slaked lime reacting together, yield formate of calcium and chloroform, the latter distils over.

$$2C_2HCl_3O + Ca2HO = Ca2CHO_2 + 2CHCl_3.$$

Chloroform thus obtained contains as impurities a little spirit and some liquid hydrocarbons. From the former it may be freed by agitation with water, and from the latter by shaking with sulphuric acid and distilling. The sulphuric acid removes the hydrocarbons by charring, and as the chloroform which distils over is liable to contain a little sulphurous acid (formed by the reduction of the sulphuric acid by the carbon), it is freed from this and any moisture by agitation with lime and chloride of calcium.

The official chloroform has a sp. gr. of 1·497.

The sp. gr. of absolute chloroform is 1·5, but the alcohol added to preserve it reduces the density to 1·497.

The Pharmacopœia orders 1 per cent. by weight of ethylic alcohol to be added to the chloroform at the end of the process.

The best test for its purity is to allow a little of the chloroform to evaporate from the hand, when any injurious impurity will be detected by the smell.

Chloroform is a limpid colourless liquid, of an agreeable ethereal odour and sweet taste. Dissolves in alcohol and ether in all proportions, and in water to the extent of 1 volume in 200. After agitation with sulphuric acid the latter is not coloured to any greater extent than that producible by absolute chloroform to which 1 per cent. of

ethylic alcohol has been added. It leaves no residue and no unpleasant odour after evaporation.

Dose—3 to 10 minims.

Used in the preparation of Aqua Chloroformi; Linimentum Chloroformi; Liquor Gutta Percha; Spiritus Chloroformi; Tinctura Chloroformi Composita; Tinctura Chloroformi et Morphinæ.

Cocainæ Hydrochloras. $C_{17}H_{21}NO_4,HCl$.

Hydrochlorate of Cocaine.

The hydrochlorate of an alkaloid obtained from the leaves of Erythroxylon Coca. It may be obtained by agitating with ether an aqueous solution of an acidulated alcoholic extract, made alkaline with carbonate of sodium; separating and evaporating the ethereal liquid, purifying the product by repeating the treatment with acidulated water, carbonate of sodium, and ether; decolorising; neutralising with hydrochloric acid, and recrystallising.

Characters and Tests.—In almost colourless acicular crystals or crystalline powder, readily soluble in water, alcohol, and ether. Its solution in water has a bitter taste; gives a yellow precipitate with chloride of gold, and a white precipitate with carbonate of ammonium, soluble in excess of the reagent. Its solution produces on the tongue a tingling sensation followed by numbness. The aqueous solution dilates the pupil of the eye. It dissolves without colour in cold concentrated acids, but chars with hot sulphuric acid. The solution yields little or no cloudiness with chloride of barium or oxalate of ammonium. Ignited in the air it burns without residue.

Dose—$\frac{1}{5}$ to 1 grain.

Preparation.—Lamellæ Cocainæ.

Collodia.

Collodions.

There are 3 official collodions, which are merely solutions of gun-cotton. Two are used to form coatings when applied to the skin, the other for blistering purposes.

Collodium.

Collodion.

Pyroxylin	1 ounce
Ether	36 fluid ounces
Rectified Spirit...	12 fluid ounces.

Mix the ether and the spirit and add the pyroxylin; set aside for a few days, and should there be any sediment, decant the clear solution.

If any matter be left insoluble, it may consist of trinitro-cellulin, mononitro-cellulin (see pyroxylin), or a little undecomposed cotton. Collodion, when applied to a healing wound, leaves a thin film of pyroxylin, which supplies the place of skin, the spirit and ether rapidly evaporating.

Collodion is a colourless highly inflammable liquid with ethereal odour, which dries rapidly upon exposure to the air, and leaves a thin transparent film, insoluble in water and rectified spirit.

The cause of collodion being sometimes lumpy is due to the presence of one of the other nitro-cellulins, probably mononitro-cellulin. It should be kept in well-corked bottles.

When poured on the skin it contracts in drying.

Used in the preparation of Collodium Flexile.

Collodium Flexile.

Flexible Collodion.

Collodion	12 fluid ounces
Canada Balsam	$\frac{1}{2}$ ounce
Castor Oil	$\frac{1}{4}$ ounce.

Mix, and keep in a well-corked bottle.

This leaves a more flexible film, and is a far better substitute for skin than ordinary collodion, and does not contract on drying.

Collodium Vesicans.

Blistering Collodion.

Synonym :—Collodium Cantharidatum.

Blistering Liquid	...	...	20 fluid ounces
Pyroxylin	...	...	1 ounce.

Add the pyroxylin to the liquid in a stoppered bottle, and shake them together until the former is dissolved.

This is a new preparation, and is considered to contain too much pyroxylin, which according to Conroy gives a solid product instead of a liquid one.

Confectiones.

Confections are soft pasty preparations containing a medicine blended with some form of sugar.

There are 8 official confections.

Confection of roses and confection of hips are used principally as pill excipients.

Confectio Opii.

Confection of Opium.

Compound Powder of Opium		...	100 grains
Syrup	... ...	...	300 grains.

Mix

(*It contains* 1 *of powdered opium in* 40.)

This preparation is sometimes given in the form of tablets, weighing about 20 grains each.

Dose—5 to 20 grains.

Confectio Piperis.

Confection of Pepper.

Black Pepper, in fine powder	...	2 ounces
Caraway Fruit, in fine powder	...	3 ounces
Clarified Honey	...	15 ounces

Rub them well together in a mortar.

This preparation is similar to Ward's paste, which contains also elecampane and fœnugreek.

(1 *of pepper in* 10.)

Dose—60 to 120 grains.

Confectio Rosæ Caninæ.

Confection of Hips.

Hips deprived of their seed-like fruits...		1 pound
Refined Sugar		2 pounds.

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.

The fruits are removed on account of the small hairs on their surface acting as mechanical irritants, like those of cowhage.

It is used as a basis for pills, and for making electuaries and linctuses. The great drawback to its use is its tendency to candy or concrete by keeping.

Confectio Rosæ Gallicæ.

Confection of Roses.

Synonym :—Conserva Rosæ.

Fresh Red-Rose Petals	1 pound
Refined Sugar...	3 pounds.

Beat the petals to a pulp in a stone mortar, add the sugar, and rub them well together.

If honey were used in place of sugar, it would give a confection less liable to dry on the surface.

This confection forms a better basis for pills than confection of hips. It has no tendency to candy ; does not ferment nor turn mouldy.

This confection must not be made in an iron mortar, or its colour will be spoiled by the formation of black tannate of iron (on account of the tannin contained in the petals).

Used in the preparation of Pil. Aloes Barb. ; Pil. Aloes et Asafœtidæ ; Pil. Aloes et Ferri ; Pil. Aloes Soc. ; Pil. Ferri Carb. ; Pil. Hydrarg. ; and Pil. Plumbi cum Opio.

Confectio Scammonii.

Confection of Scammony.

Resin of Scammony, in powder ...	6 ounces
Ginger, in fine powder	3 ounces
Oil of Caraway	$\frac{1}{4}$ fluid ounce
Oil of Cloves	$\frac{1}{8}$ fluid ounce
Syrup	6 fluid ounces
Clarified Honey	3 ounces.

Rub the powders with the syrup and the honey into a uniform mass, then add the oils, and mix.

(*It contains* 1 *of scammony resin in* 3.)

Resin of scammony has been substituted for scammony in this confection, which materially affects the price.

Dose—10 to 30 grains.

Confectio Sennæ.

Confection of Senna.

Synonym:—*Lenitive Electuary.*

Senna, in fine powder	7 ounces
Coriander Fruit, in fine powder ...	3 ounces
Figs	12 ounces
Tamarind	9 ounces
Cassia pulp	9 ounces
Prunes	6 ounces
Extract of Liquorice	1 ounce
Refined Sugar	30 ounces
Distilled water, a sufficiency to make	75 ounces.

Boil the figs and prunes gently with 24 ounces of distilled water in a covered vessel for 4 hours, then, having added more distilled water to make up the quantity to its original volume, mix the tamarind and cassia pulp, digest for 2 hours, and rub the softened pulp of the fruits through a hair sieve, rejecting the seeds and other hard parts. To the pulpy product add the sugar and extract of liquorice, and dissolve them with the aid of a little heat; while the mixture is still warm, add to it gradually the mixed senna and coriander powders, and mix the whole thoroughly, making the weight of the resulting confection 75 ounces either by evaporation or by the addition of more distilled water.

In making this confection the senna and coriander are added last to prevent the escape of the volatile oil.

This preparation would be improved by the addition of a little more water, as it is often too thick.

(*It contains* 1 *of senna in* 11.)

Dose—60 to 120 grains.

Confectio Sulphuris.

Confection of Sulphur.

Sublimed Sulphur	4 ounces
Acid Tartrate of Potassium, in powder	1 ounce
Syrup of Orange Peel	4 fluid ounces
Tragacanth, in powder	18 grains.

Rub them well together.

(*It contains* 1 *of sulphur in* $2\frac{1}{2}$.)

Dose—60 to 120 grains.

The addition of tragacanth is a great improvement, as it prevents the separation of the sulphur and cream of tartar, and gives to it a better consistence.

Confectio Terebinthinæ.

Confection of Turpentine.

Oil of Turpentine	1 fluid ounce
Liquorice Root, in powder ...	1 ounce
Clarified Honey	2 ounces.

Rub the oil of turpentine with the liquorice, add the honey, and mix to a uniform consistence.

If the turpentine separates, pour it off, and re-add it gradually with constant trituration.

(*It contains* 1 *of oil of turpentine in* 4.)

This preparation is often given on wafer paper.

Dose—60 to 120 grains.

Creasotum.

Creasote.

Is an artificial product prepared from the oil which is obtained by the distillation of wood tar.

Creasote is the first substance which comes over when the tar is distilled.

The portions of the oil which are heavier than water are freed from adhering acetic acid by carbonate of potassium, and are afterwards distilled. A little phosphoric acid, to neutralise ammonia, is mixed with the product, which is again distilled. It is next mixed with a strong solution of caustic potash, which combines with the creasote. This is separated from impurities and neutralised by sulphuric acid, the creasote which separates is collected and distilled. To completely purify it the treatment with potash, &c., should be frequently repeated.

For distinguishing characters between creasote and carbolic acid *see Carbolic Acid*.

Coal tar oil yields impure or crude creasote, which may be distinguished from wood creasote by the fact that it forms a jelly when shaken with collodion or albumen; pure wood creasote is scarcely affected.

Creasote is a liquid, colourless, or having a yellowish tinge, and a strong empyreumatic odour. It is sparingly dissolved by water, but freely by alcohol, ether, and glacial acetic acid. Specific gravity 1·071. It does not coagulate albumen. Dropped on white filtering paper and exposed to a temperature of 212° F. it leaves no translucent stain. It turns the plane of polarisation of a ray of polarised light to the right. It is not solidified by the cold produced by

a mixture of hydrochloric acid and sulphate of sodium. It is miscible with collodion without producing any coagulation. An aqueous solution (1 per cent.) with a drop of dilute neutral solution of ferric chloride yields a green coloration, rapidly changing to a reddish-brown, and, unless the mixture is very dilute, giving a reddish-brown precipitate.

Dose—1 to 3 drops.

Drops vary in size according to the nature of the lip of the bottle: thick lips will give large drops, thin lips small drops; the viscidity of the liquid will also affect the size of the drop.

It is used in the preparation of Mist. Creasoti; Ung. Creasoti; and Vapor Creasoti.

Decocta

Decoctions.

Decoctions are watery solutions prepared by boiling drugs with water.

The process is not a suitable one for substances containing aromatic constituents, as they would be dissipated by the heat.

The decoctions of the Pharmacopœia are ordered to be boiled for 10 minutes, with the exception of Dec. Aloes Co. (5 minutes), and Dec. Hordei (20 minutes), Dec. Pareiræ (15 minutes), and Dec. Granati Radicis (boiled down to one-half).

There are 13 official decoctions, viz.:—

Decoctum	Aloes Compositum ...	4 gr. in 1 fl. ounce
,,	Cetrariæ	1 oz. to 1 pint
,,	Cinchonæ	1¼ ,, 1 ,,
,,	Granati Radicis ...	2 ,, 1 ,,
,,	Hæmatoxyli ...	1 ,, 1 ,,
,,	Hordei	2 ,, 1½ ,,
,,	Papaveris	2 ,, 1 ,,
,,	Pareiræ	1¼ ,, 1 ,,
,,	Quercus	1¼ ,, 1 ,,
,,	Sarsæ	2½ ,, 1 ,,
,,	Sarsæ Compositum...	2½ ,, 1 ,,
,,	Scoparii	1 ,, 1 ,,
,,	Taraxaci	1 ,, 1 ,,

Decoctum Aloes Compositum.

Compound Decoction of Aloes.

Extract of Socotrine Aloes ...	½ ounce
Myrrh	of each ¼ ounce
Saffron	
Carbonate of Potassium	
Extract of Liquorice	2 ounces
Compound Tincture of Cardamoms	15 fluid ounces
Distilled Water	a sufficiency to make 50 fluid ounces.

Reduce the extract of aloes and the myrrh to coarse powder, and put them, together with the carbonate of potassium and the extract of liquorice, into a suitable covered vessel with a pint of distilled water; boil gently for five minutes, then add the saffron. Let the vessel with its contents cool, then add the tincture of cardamoms, and, covering the vessel closely, allow the ingredients to macerate for two hours; finally, strain through flannel, pouring as much distilled water over the contents of the strainer as will make the strained product measure fifty fluid ounces.

This preparation should be kept in vessels from which air is excluded as far as possible.

This decoction loses its bitterness by keeping, on account of the carbonate of potassium decomposing the active principles of the aloes. The carbonate of potassium is used chiefly to form a soap (myrrhate of potassium) with the acid resin (Myrrhic acid) of the myrrh, which soap helps to suspend any insoluble matter present in the decoction.

The saffron is added while the liquid is hot, to extract the colouring matter, but not boiled, as its aroma would be driven off.

It is sometimes kept in stock in the concentrated state. It cannot be made stronger than double the strength.

Dose—$\frac{1}{2}$ to 2 fluid ounces.

It contains 4·375 *grains of extract of Aloes in* 1 *fl. ounce, or about* 1 *in* 100.

Decoctum Cetrariæ.

Decoction of Iceland Moss.

Iceland Moss	1 ounce
Distilled Water	1 pint.

Wash the moss in cold water, to remove impurities; boil it with the distilled water for ten minutes in a covered vessel, and strain, with gentle pressure, while hot; then pour distilled water over the contents of the strainer until the strained product measures a pint.

Dose—1 to 4 fluid ounces.

(*It contains about* 1 *of cetraria in* 20.)

Decoctum Cinchonæ.

Decoction of Cinchona.

Red Cinchona Bark, in No. 20 powder	1¼ ounce
Distilled Water	1 pint.

Boil for ten 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 a pint.

Red bark is now used in place of yellow bark.

This decoction is ordered not to be strained until cold, in order to allow cinchona red to deposit. This is soluble in hot water, but insoluble in cold. It begins to precipitate when the temperature falls below 88° F.

Nearly half the active principles, originally in the bark, remain in the marc, after the decoction is made.

The addition of a little sulphuric acid increases the value of this preparation by rendering the alkaloids soluble.

Dose—1 to 2 fluid ounces.

(*It contains about* 1 *in* 16.)

Decoctum Granati Radicis.

Decoction of Pomegranate Root.

Pomegranate Root Bark, sliced ...	2 ounces
Distilled Water	2 pints.

Boil down to a pint, and strain, making the strained product up to a pint, if necessary, by pouring distilled water over the contents of the strainer.

Dose—2 to 4 fluid ounces.

(*It contains about* 1 *in* 10.)

Decoctum Hæmatoxyli.

Decoction of Logwood.

Logwood, in chips	1 ounce
Cinnamon Bark, bruised	55 grains
Distilled Water...	1 pint.

Boil the logwood in the water for ten minutes in a covered vessel, adding the cinnamon towards the end. Strain the decoction, and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

The cinnamon is added towards the end of the boiling, so as to avoid the loss of the essential oil. Iron vessels should not be used.

Dose—1 to 2 fluid ounces.

(*It contains* 1 *in* 20.)

Decoctum Hordei.

Decoction of Barley.

Synonym :—Barley Water.

Pearl Barley	2 ounces
Distilled Water	$1\frac{1}{2}$ pint.

Wash the barley in cold water, and reject the washings; boil the washed barley with the distilled water for twenty minutes in a covered vessel, and strain. Product, about 1 pint.

Dose—1 to 4 fluid ounces.

(*It contains about* 1 *in* 10.)

Decoctum Papaveris.

Decoction of Poppy.

Poppy Capsules, bruised	...	...	2 ounces
Distilled Water	...	...	$1\frac{1}{2}$ pint.

Boil for ten minutes in a covered vessel, then strain, and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

(*It contains about* 1 *in* 10.)

Decoctum Pareiræ.

Decoction of Pareira.

Pareira Root, in No. 20 powder		...	$1\frac{1}{4}$ ounce
Distilled Water	...	...	1 pint.

Boil for fifteen minutes in a covered vessel, then strain and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

Dose—1 to 2 fluid ounces.

The quantity of pareira root has been reduced from $1\frac{1}{2}$ to $1\frac{1}{4}$ ounces.

(*It contains about* 1 *in* 16.)

Decoctum Quercus.

Decoction of Oak Bark.

Oak Bark, bruised	...	...	$1\frac{1}{4}$ ounce
Distilled Water	...	...	1 pint.

Boil for ten minutes in a covered vessel, then strain, and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

Dose—1 to 2 ounces.

(*It contains about* 1 *in* 16.)

Decoctum Sarsæ.

Decoction of Sarsaparilla.

Jamaica Sarsaparilla, cut transversely	$2\frac{1}{2}$ ounces
Boiling Distilled Water	$1\frac{1}{2}$ pint.

Digest the sarsaparilla in the water for an hour, then boil for ten minutes in a covered vessel, cool and strain, pouring distilled water, if required, over the contents of the strainer, or otherwise making the strained product measure a pint.

Dose—2 to 10 fluid ounces.

(*It contains about* 1 *in* 8.)

Decoctum Sarsæ Compositum.

Compound Decoction of Sarsaparilla.

Jamaica Sarsaparilla, cut transversely...	$2\frac{1}{2}$ ounces
Sassafras Root, in chips Guaiacum Wood turnings Dried Liquorice Root, bruised } of each...	$\frac{1}{4}$ ounce
Mezereon Bark	$\frac{1}{8}$ ounce
Boiling Distilled Water...	$1\frac{1}{2}$ pint.

Digest the solid ingredients in the water for an hour, then boil for ten minutes in a covered vessel; cool and strain, pouring distilled water, if required, over the contents of the strainer, or otherwise making the strained product measure a pint.

The ingredients are ordered to be digested in water for an hour before boiling, as the active principles can be more easily abstracted when the pores of the woody matter have become expanded by the heat. The sarsaparilla root is cut transversely, as the boiling water is then incapable of dissolving the starch contained in it.

Dose—2 to 10 fluid ounces.

It was formerly made with fresh liquorice root.

(*It contains about* 1 *in* 8.)

Decoctum Scoparii.

Decoction of Broom.

Broom Tops, dried	1 ounce
Distilled Water...	1 pint.

Boil for ten minutes in a covered vessel, then strain, and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

Dose—2 to 4 fluid ounces.

(*It contains about* 1 *in* 20.)

Decoctum Taraxaci.

Decoction of Dandelion.

Dried Dandelion Root, sliced and bruised...	1 ounce
Distilled Water	1 pint.

Boil for ten minutes in a covered vessel, then strain, and pour as much distilled water over the contents of the strainer as will make the strained product measure a pint.

Dose—2 to 4 fluid ounces.

(*It contains about* 1 *in* 20.)

Emplastra.

Plasters.

Plasters are usually spread on calico, linen, or leather, and are applied to the surface of the body for various purposes : some are used as a means of support, such as lead, resin, and soap—others possess anodyne properties,

as Opium and Belladonna—others are stimulating, or blistering.

Of the 14 official plasters, Lead Plaster and Resin Plaster form the bases of 11, the 3 exceptions are Emplastrum Ammoniaci cum Hydrargyro; E. Cantharidis; and E. Picis.

Emplastrum Ammoniaci cum Hydrargyro.

Ammoniacum and Mercury Plaster.

Ammoniacum	...	...	...	12 ounces
Mercury	...	...	...	3 ounces
Olive Oil	...	...	...	56 grains
Sublimed Sulphur	...	...	...	8 grains.

Heat the oil, and add the sulphur to it gradually, stirring till they unite. With this mixture triturate the mercury, until globules are no longer visible; and, lastly, add the ammoniacum, previously liquefied, mixing the whole carefully.

The sulphur is used to effect the minute division of the mercury; this it does by forming a little black sulphide of mercury, which produces what is technically known as flooring of the mercury, *i.e.*, loss of fluidity.

(*It contains about* 1 *in* 3.)

Emplastrum Belladonnæ.

Belladonna Plaster.

Alcoholic Extract of Belladonna	...		4 ounces
Resin Plaster }			
Soap Plaster }	...	of each	8 ounces.

Melt the plasters by the heat of a water-bath, then add the extract, and mix the whole thoroughly together.

In the 1867 Pharmacopœia, the ordinary extract of belladonna was used; but now the alcoholic extract of the root is ordered, which makes a much better preparation.

The rectified spirit is omitted, and soap plaster introduced. The colour of the new preparation is not the same as that prepared by the old formula.

In spreading this plaster care must be taken not to employ a very hot spatula, or the properties of the extract will be injured.

Emplastrum Calefaciens.

Warming Plaster.

Synonym:—Warm Plaster.

Cantharides, in coarse powder	} of each 4	ounces
Expressed Oil of Nutmeg ...		
Yellow Wax		
Resin		
Resin Plaster	$3\frac{1}{4}$	pounds
Soap Plaster	2	pounds
Boiling Water	1	pint.

Infuse the cantharides in the boiling water for six hours; squeeze strongly through calico, and evaporate the expressed liquid by a water-bath till reduced to one-third. Then add the other ingredients, and melt in a water-bath, stirring well until the whole is thoroughly mixed.

It is simply an aqueous extract of cantharides.

(*It contains about* 1 *in* 25.)

Emplastrum Cantharidis.

Cantharides Plaster.

Synonym :—Emplastrum Lyttæ.

Cantharides, in powder	...	...	12	ounces
Yellow Wax Prepared Suet	...	...	$7\frac{1}{2}$	ounces
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.

Occasionally a little powdered cantharides is applied to the surface.

(*It contains about* 1 *in* 3.)

Emplastrum Ferri.

Iron Plaster.

Synonyms :—Chalybeate Plaster, Strengthening Plaster, Emplastrum Roborans.

Peroxide of Iron, in fine powder			1	ounce
Burgundy Pitch	...	...	2	ounces
Lead Plaster ...	...	...	8	ounces.

Add the peroxide of iron to the Burgundy pitch and lead plaster, previously melted together, and stir the mixture constantly till it stiffens on cooling.

Emplastrum Galbani.

Galbanum Plaster.

Galbanum Ammoniacum Yellow Wax	...	...of each 1 ounce
Lead Plaster ...	...	... ... 8 ounces.

Melt the galbanum and ammoniacum together, and strain; then add the mixture to the lead plaster and wax, also previously melted together, and mix the whole thoroughly.

It is strained from mechanical impurities, such as pieces of wood, &c.

(*It contains about* 1 *in* 11.)

Emplastrum Hydrargyri.

Mercurial Plaster.

Mercury	3 ounces
Olive Oil	56 grains
Sublimed Sulphur	8 grains
Lead Plaster	6 ounces.

Heat the oil and add the sulphur to it gradually, stirring until they unite; with this mixture triturate the mercury until globules are no longer visible, then add the lead plaster previously liquefied, and mix the whole thoroughly.

(*It contains about* 1 *in* 3.)

Emplastrum Menthol.

Menthol Plaster.

Menthol	2 ounces
Yellow Wax	1 ounce
Resin	7 ounces.

Melt the wax and resin together, and, as the mixture cools, stir in the menthol until dissolved.

Emplastrum Opii.

Opium Plaster.

Opium, in the finest powder	1 ounce
Resin Plaster	9 ounces.

Melt the resin plaster by means of a water-bath ; then add the opium by degrees, and mix thoroughly.

(*It contains* 1 *in* 10.)

Emplastrum Picis.

Pitch Plaster.

Burgundy Pitch...		26 ounces
Common Frankincense		13 ounces
Resin, Yellow Wax	of each	$4\frac{1}{2}$ ounces
Expressed Oil of Nutmeg ...		1 ounce
Olive Oil, Water	of each	2 fluid ounces.

Add the oils and the water to the frankincense, Burgundy pitch, resin, and wax, previously melted together ; then, constantly stirring, evaporate to a proper consistence.

The common frankincense is added to give colour and consistence.

Emplastrum Plumbi.

Lead Plaster.

Synonyms :—Diachylon Plaster, Emplastrum Lithargyri, White Diachylon.

Oxide of Lead, in fine powder				...	5 pounds
Olive Oil	...	...	...	...	10 pounds
Water ...	...	...	...	...	5 pounds.

Boil all the ingredients together gently by the heat of a steam-bath, and keep them simmering for four or five hours, stirring constantly until the product acquires a proper consistence for a plaster, and adding more water during the process if necessary.

The best Italian oil should be used, if inferior oils are employed the plaster will not possess the necessary adhesiveness. When the oil, oxide of lead, and water are boiled together, the oil is decomposed by the oxide of lead, and water, into two soaps, oleate and stearate of lead; glycerine is at the same time formed, and remains dissolved in the water.

$$\underset{\text{Oxide of Lead.}}{3PbO} + \underset{\text{Water.}}{3H_2O} + \underset{\text{Olive Oil.}}{2(C_3H_5 3C_{18}H_{33}O_2)} =$$

$$\underset{\text{Lead Plaster.}}{3Pb\,2C_{18}H_{33}O_2} + \underset{\text{Glycerine.}}{2C_3H_5 3HO}.$$

The water is used to combine with the glycerine.

The objection to some samples of lead plaster is the quantity of glycerine present.

It is used in the preparation of Emp. Ferri; Emp. Galbani; Emp. Hydrargyri; Emp. Plumbi Iodidi; Emp. Resinæ; and Emp. Saponis.

Emplastrum Plumbi Iodidi.

Iodide of Lead Plaster.

Iodide of Lead...	2 ounces
Lead Plaster	1 pound
Resin	2 ounces.

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.

(*It contains* 1 *in* 10.)

Emplastrum Resinæ.

Resin Plaster.

Synonym :—Adhesive Plaster.

Resin	4 ounces
Lead Plaster	2 pounds
Curd Soap	2 ounces.

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.

(*It contains* 1 *in* $9\frac{1}{2}$.)

Used in the preparation of Emp. Belladonnæ; Emp. Calefaciens ; and Emp. Opii.

Emplastrum Saponis.

Soap Plaster.

Curd Soap	6 ounces
Lead Plaster	$2\frac{1}{4}$ pounds
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.

(*It contains* 1 *of soap in* $7\frac{1}{6}$.)

Used in the preparation of Emp. Calefaciens.

Emplastrum Saponis Fuscum.

Brown Soap Plaster.

Synonym:—Emplastrum Cerati Saponis.

Curd Soap, in powder	... ...	10 ounces
Yellow Wax ...	... ...	$12\frac{1}{2}$ ounces
Olive Oil ...	.. ...	1 pint
Oxide of Lead	... ...	15 ounces
Vinegar ...	... ...	1 gallon.

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 the evaporation of the remaining moisture the product has acquired the proper consistence for a plaster.

This is the only official preparation in which vinegar is used. When the oxide of lead and vinegar are boiled together, the acetic acid of the vinegar combines with the oxide of lead to form acetate of lead.

Enemata.

Enemas.

There are five official enemas, viz.:—Aloes, Asafœtida, Sulphate of Magnesium, Opium, and Turpentine.

Enema Aloes.

Enema of Aloes.

Aloes	40 grains
Carbonate of Potassium ...	15 grains
Mucilage of Starch	10 fluid ounces.

Mix, and rub together.

This may be made with either Barbadoes or Socotrine aloes.

Enema Asafœtidæ.

Enema of Asafœtida.

Asafœtida	30 grains
Distilled Water	4 fluid ounces.

Rub the asafœtida in a mortar with the water added gradually, so as to form an emulsion.

Enema Magnesii Sulphatis.

Enema of Sulphate of Magnesium.

Sulphate of Magnesium... ...	1 ounce
Olive Oil	1 fluid ounce
Mucilage of Starch	15 fluid ounces.

Dissolve the sulphate of magnesium in the mucilage of starch, add the oil, and mix.

Enema Opii.

Enema of Opium.

Tincture of Opium	$\frac{1}{2}$ fluid drachm
Mucilage of Starch	2 fluid ounces.

Mix.

Enema Terebinthinæ.

Enema of Turpentine.

Oil of Turpentine	...	... 1 fluid ounce
Mucilage of Starch	...	... 15 fluid ounces.

Mix.

Ergotinum.

Ergotin.

Purified extract of Ergot, commonly called Ergotin, Ergotine, or Bonjean's Ergotine.

Liquid Extract of Ergot Rectified Spirit	...	} of each 4 fluid ounces.

Evaporate the fluid extract by a water-bath to a syrupy consistence, and when cold mix with the spirit. Let it stand for half an hour, then filter, and evaporate the filtered liquid to the consistence of a soft extract.

Dose—2 to 5 grains.

Used in the preparation of Injectio Ergotini Hypodermica.

Essentiæ.

Essences.

There are only 2 official Essences, Essentia Anisi and Essentia Menthæ Piperitæ.

Essentia Anisi.

Essence of Anise.

Oil of Anise	...	...	1 fluid ounce
Rectified Spirit	...	...	4 fluid ounces.

Mix.

Dose—10 to 20 minims.

Essentia Menthæ Piperitæ.

Essence of Peppermint.

Oil of Peppermint	...	...	1 fluid ounce
Rectified Spirit	...	...	4 fluid ounces.

Mix.

Dose—10 to 20 minims.

Extracta.

Extracts.

There are 50 extracts, of which 15 are fluid, 5 hard, and 30 semi-solid.

13 new ones have been introduced in the present Pharmacopœia, 6 of these are solid and 7 liquid, and the latter are ordered to be made of such a strength that 1 fluid ounce is to be equal to 1 ounce of the crude drug.

The green extracts (*so called from their containing the chlorophyll or green colouring matter of the plant*) simply consist of the fresh juice of the plant deprived of its albumen and evaporated to a suitable consistence.

In the directions for the preparation of the green extracts, the green colouring matter is ordered to be passed through

a hair sieve, before returning it to the extract, with the object of forming a more intimate mixture.

The following are the official green extracts.

Extractum	Aconiti ...	Fresh leaves and flowering tops.
,,	Belladonnæ..	Fresh leaves and young branches.
,,	Conii ...	Fresh leaves and young branches.
,,	Hyoscyami..	Fresh leaves and young branches.
,,	Lactucæ ...	The flowering herb.

The Extracts may be classed as follows :—

No. 1.—Natural Extracts.

Prepared by evaporating the juice of the plants, such as the green extracts of Dandelion and Colchicum.

No. 2.—Aqueous Extracts.

Those in which the active constituents are removed by water, *e.g.*, Aloes, Liquid Bael and Gentian.

No. 3.—Alcoholic.

Those in which the drug is exhausted with alcohol, as Belladonna and Liquid Cimicifuga.

No. 4.—Hydro-alcoholic.

Those in which the solvent employed is proof spirit, as Liquid Coca and Calumba.

No. 5.—Ethereo-alcoholic.

In which alcohol, and then ether is employed as the solvent, as Mezereon.

Extractum Aconiti.

Extract of Aconite.

The fresh leaves and flowering tops of Aconite	112 pounds.

Bruise in a stone mortar, and press out the juice ; heat it gradually to 130° F., and separate the green colouring matter

by a calico filter. Heat the strained liquor to 200° F. to coagulate the albumen, and again filter. Evaporate the filtrate by a water-bath to the consistence of a thin syrup; then add to it the green colouring matter previously separated and passed through a hair sieve, and, stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140° F., until the extract is of a suitable consistence for forming pills.

A higher temperature than 140° F. would destroy the colour of the chlorophyll.

If the albumen is allowed to remain in the extract fermentation will take place.

(100 lbs. of the plant produce 50 lbs. of juice, which is equal to about 7 lbs. of extract.)

Dose—$\frac{1}{4}$ to 1 grain.

Extractum Aloes Barbadensis.

Extract of Barbadoes Aloes.

Barbadoes Aloes, in small fragments...	1 pound
Boiling Distilled Water	1 gallon.

Add the aloes to the water, and stir well until they are thoroughly mixed. Set aside for 12 hours; then pour off the clear liquid, strain the remainder, and evaporate the mixed liquors by a current of warm air to dryness.

The insoluble portion consists principally of resin and amorphous aloin; the crystalline aloin being dissolved.

(100 lbs. of Barbadoes aloes yield about 75 lbs. of extract.)

The extract is evaporated by a current of warm air; the heat of a water bath, according to Aitkin, causes the formation of a considerable amount of inactive resin.

Extracts evaporated by means of hot air are almost free from resin.

Dose.—2 to 6 grains.

Extractum Aloes Socotrinæ.

Extract of Socotrine Aloes.

Synonym :—Extractum Aloes Aquosum.

Socotrine Aloes, in small fragments ...	1 pound
Boiling Distilled Water	1 gallon.

Add the aloes to the water, and stir well until they are thoroughly mixed. Set aside for twelve hours ; then pour off the clear liquid, strain the remainder, and evaporate the mixed liquors by a current of warm air to dryness.

Warm air is used for the same purpose as in Ext. Aloes Barb.

(100 lbs. of Socotrine aloes yield about 50 lbs. of extract.)

Dose.—2 to 6 grains.

The extract being more active than the aloes alone, it can be made into a smaller pill, and acts more pleasantly.

Used in the preparation of Dec. Aloes Co., and Ext. Coloc. Co.

Extractum Anthemidis.

Extract of Chamomile.

Chamomile Flowers	1 pound
Oil of Chamomile	15 minims
Distilled Water	1 gallon.

Boil the chamomile flowers with the water until the volume is reduced to one half, then strain, press, and filter.

Evaporate the liquor by a water-bath, until the extract is of a suitable consistence for forming pills, adding the oil of chamomile at the end of the process.

The essential oil of chamomile is added at the end of the process to compensate for the natural oil, which is lost during the process of evaporation.

The water dissolves out the extractive matter to which the tonic properties of chamomile flowers are due.

(100 lbs. of flowers yield 47 lbs of extract.)

Dose.—2 to 10 grains.

Extractum Belæ Liquidum.

Liquid Extract of Bael.

Bael Fruit...	...	...	... 1 pound
Distilled Water	...	...	... 13 pints
Rectified Spirit	...	...	... 3 fluid ounces.

Macerate the bael for 12 hours in one-third of the water; pour off the clear liquor; repeat the maceration a second and third time for one hour in the remaining two-thirds of the water; press the marc; and filter the mixed liquors through flannel. Evaporate to 13 fluid ounces, and, when cold, add the rectified spirit.

As this extract contains a quantity of mucilaginous matter, it would be difficult to filter it through any other substance but flannel.

The addition of the rectified spirit is to prevent decomposition.

A fluid ounce is equal to an ounce of bael.

Dose.—1 to 2 fluid drachms.

Extractum Belladonnæ.

Extract of Belladonna.

The fresh leaves and young branches of Belladonna ... ... } 112 pounds.

Bruise in a stone mortar, and press out the juice ; heat it gradually to 130° F., and separate the green colouring matter by a calico filter. Heat the strained liquor to 200° F. to coagulate the albumen, and again filter. Evaporate the filtrate by a water-bath to the consistence of a thin syrup ; then add to it the green colouring matter previously separated and passed through a hair sieve, and stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140° F., until the extract is of a suitable consistence for forming pills.

(100 lbs. of herb yield nearly 4 lbs. of extract. 100 lbs. of fresh leaves, when dried, weigh about 16 lbs.)

Dose.—$\frac{1}{4}$ to 1 grain.

Extractum Belladonnæ Alcoholicum.

Alcoholic Extract of Belladonna.

Belladonna Root, in No. 20 powder... 1 pound
Rectified Spirit }
Distilled Water } ... ... of each a sufficiency.

Mix the belladonna with 2 pints of the spirit, and macerate in a closed vessel for 48 hours ; then transfer to a percolator, and when the fluid ceases to pass continue the percolation with water until 2 pints of liquid have been collected. Evaporate the percolated liquid by a water-bath until the extract has acquired a suitable consistence.

This alcoholic extract is about $1\frac{1}{2}$ times stronger than the ordinary extract.

Dose.—$\frac{1}{16}$ to $\frac{1}{4}$ grain.

Used in the preparation of Emp. Belladonnæ and Ung. Belladonnæ.

Extractum Calumbæ.

Extract of Calumba.

Calumba Root, cut small	...	...	1 pound
Proof Spirit ...	...	...	...	4 pints.

Macerate the calumba with 2 pints of the proof spirit for 12 hours, strain and press. Macerate again with the same quantity of proof spirit, strain and press as before. Mix and filter the liquors, recover the spirit by distillation, and evaporate the residue by the heat of a water-bath until the extract is of a suitable consistence for forming pills.

This extract was formerly prepared by double maceration in cold water.

The spirit is recovered for the sake of economy, as it is not required in the extract.

Dose.—2 to 10 grains.

Extractum Cannabis Indicæ.

Extract of Indian Hemp.

Indian Hemp, in coarse powder	...	1 pound
Rectified Spirit... ...	...	...	4 pints.

Macerate the hemp in the spirit for 7 days, and press out the tincture. Distil off the greater part of the spirit, and evaporate what remains by a water-bath to the consistence of a soft extract.

Dose.—$\frac{1}{4}$ to 1 grain.

Used in the preparation of Tinct. Cannabis Indicæ.

Extractum Cascaræ Sagradæ.

Extract of Cascara Sagrada.

Synonym :—Extractum Rhamni Purshiani.

Cascara Sagrada, in No. 40 powder...			1 pound
Proof Spirit Distilled Water	}	... ...	of each a sufficiency.

Mix the cascara with 2 pints of the spirit, and macerate in a closed vessel for 48 hours ; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with water until three pints of liquid have been collected, or the cascara is exhausted. Evaporate the percolated liquid by a water-bath until the extract has acquired a suitable consistence.

Dose.—2 to 8 grains.

Extractum Cascaræ Sagradæ Liquidum.

Liquid Extract of Cascara Sagrada.

Synonym :—Extractum Rhamni Purshiani Liquidum.

Cascara Sagrada, in coarse powder...				1 pound
Rectified Spirit	...	...	...	4 fluid ounces
Distilled Water	...	...	...	a sufficiency.

Boil the bark in 3 or 4 successive quantities of the water until exhausted. Evaporate the strained liquors by a water-bath to 12 fluid ounces ; when cold add the spirit ; allow the mixture to remain for some hours, then filter, and make up to the volume of 16 fluid ounces with distilled water.

Dose.—$\frac{1}{2}$ to 2 fluid drachms.

This is an aqueous extract, as the spirit is only added after the decoction has been evaporated.

Extractum Cimicifugæ Liquidum.

Liquid Extract of Cimicifuga.

Cimicifuga, in No. 60 powder	...	...	20 ounces
Rectified Spirit	...	...	a sufficiency.

Mix the cimicifuga with 2 pints of the spirit, and macerate in a closed vessel for 48 hours; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with more spirit, until the cimicifuga is exhausted. Reserve the first 15 fluid ounces of the percolate, and evaporate the remainder by a water-bath to the consistence of a soft extract; dissolve this in the reserved portion, and make up the volume to 20 fluid ounces by the addition of more spirit.

Dose.—3 to 30 minims.

Extractum Cinchonæ Liquidum.

Liquid Extract of Cinchona.

Red Cinchona Bark, in No. 60 powder			20 ounces
Hydrochloric Acid	...	...	5 fluid drachms
Glycerine	...	...	$2\frac{1}{2}$ fluid ounces
Rectified Spirit, Distilled Water	...	...	of each a sufficiency.

Mix the bark with 5 pints of the water to which the acid and glycerine have been added, and macerate in a covered vessel for 48 hours, stirring frequently; then transfer to a percolator, and when the fluid ceases to pass, and the contents of the percolator have been properly packed, continue the percolation with water until 15 pints of liquid have passed, or that which is passing has ceased to give a precipitate on the addition to it of an excess of solution of soda. Evaporate the percolated liquid in a porcelain or enamelled iron vessel at a temperature not exceeding 180° F., until it is reduced to 20 fluid ounces.

Put 50 fluid grains of this liquid with half an ounce of distilled water into a stoppered glass separator capable of holding 4 fluid ounces ; add to this one fluid ounce of benzolated amylic alcohol and half a fluid ounce of solution of soda, shake them together thoroughly and repeatedly, then allow them to remain at rest until the spirituous solution of the alkaloids shall have separated and formed a distinct stratum over the dark-coloured alkaline solution of the other constituents of the extract. Run off the latter by the stop-cock, add a little more distilled water to wash away any still adhering alkaline solution from the separator and its contents, and having run off this as before, as completely as possible, decant the spirituous solution into a small porcelain or glass dish, the weight of which is known. Evaporate by the heat of a water-bath until a perfectly dry residue is left. The weight now of the dish and its contents, after deducting the known weight of the dish, will give that of the alkaloids, and this multiplied by 2 will give the parts by weight of the alkaloids in 100 fluid parts of the liquid.

Having thus ascertained the alkaloidal strength of the liquid, every fluid part of it containing 5 grains of total alkaloids is first to be brought to the volume of 85 grains by evaporation, or if necessary by dilution with water, then 12·5 fluid grains of rectified spirit are to be added, and the final adjustment of the volume to 100 fluid grains is to be effected by the addition of distilled water. The finished liquid extract will thus contain 5 grains of the alkaloids of the bark in every 100 fluid grains.

Dose—5 to 10 minims.

The solution of soda indicates that all the solid alkaloids have been dissolved out.

Instead of it being finished off to a stated bulk, before the process reaches completion the product is to be assayed, and then the extract finished to a given alkaloidal standard strength.

(*It contains* 5 *per cent. of total alkaloids.*)

Extractum Cocæ Liquidum.

Liquid Extract of Coca.

Coca, in No. 40 powder	20 ounces
Proof Spirit	a sufficiency.

Mix the coca with 2 pints of the spirit, and macerate in a closed vessel for 48 hours ; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with more of the spirit until the coca is exhausted. Reserve the first 15 fluid ounces of the percolate, and evaporate the remainder by a water-bath to the consistence of a soft extract, dissolve this in the reserved portion, and make up the volume to 20 fluid ounces by the addition of more spirit.

Dose—$\frac{1}{2}$ to 2 drachms.

Extractum Colchici.

Extract of Colchicum.

Fresh Colchicum Corms, deprived of their coats	7 pounds.

Crush the corms ; press out the juice ; allow the feculence to subside, and heat the clear liquor to 212° F. ; then strain through flannel and evaporate by a water-bath at a temperature not exceeding 160° F. until the extract is of a suitable consistence for forming pills.

A higher temperature than 160° F. would decompose the colchicine.

This is not a green extract, as it contains no chlorophyll.

(100 lbs. of corms yield 4 lbs. of extract.)

Dose—$\frac{1}{2}$ to 2 grains.

Extractum Colchici Aceticum.

Acetic Extract of Colchicum.

Fresh Colchicum Corms, deprived of their coats	7 pounds
Acetic Acid	7 fluid ounces.

Crush the corms, add the acetic acid, and press out the juice; allow the feculence to subside, and heat the clear liquor to 212° F.; then strain through flannel, and evaporate by a water-bath at a temperature not exceeding 160° F. to the consistence of a soft extract.

This compound contains *acetate of colchicine*, which is more soluble than the colchicine itself.

(100 lbs. of corms yield about 5 lbs. of extract.)

This extract is best made into a pill with liquorice powder.

Dose—$\frac{1}{2}$ to 2 grains.

Extractum Colocynthidis Compositum.

Compound Extract of Colocynth.

Synonym:—Extractum Catharticum.

Colocynth Pulp	6 ounces
Extract of Socotrine Aloes	12 ounces
Resin of Scammony	4 ounces
Curd Soap, in powder	3 ounces
Cardamom Seeds, in the finest powder	1 ounce
Proof Spirit	1 gallon.

Macerate the colocynth in the spirit for 4 days; press out the tincture and distil off the spirit; then add the aloes, scammony, and soap, and evaporate by a water-bath until the extract is of a suitable consistence for forming

pills, adding the cardamoms towards the end of the process.

The powdered cardamoms are not added till the end of the process, in order to prevent the dissipation of their volatile oil by the heat employed in evaporation.

The quantity ordered in the Pharmacopœia yields 24 ounces of extract.

Dose—3 to 10 grains.

Extractum Conii.

Extract of Hemlock.

The fresh leaves and young branches of Hemlock	112 pounds.

Bruise in a stone mortar, and press out the juice; heat it gradually to 130° F. (54·4° C.), and separate the green colouring matter by a calico filter. Heat the strained liquor to 200° F. (93·3° C.) to coagulate the albumen, and again filter. Evaporate the filtrate by a water-bath to the consistence of a thin syrup; then add to it the green colouring matter, previously separated and passed through a hair sieve, and, stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140° F. (60° C.), until the extract is of a suitable consistence for forming pills.

This extract, on account of the volatility of the active principle, is one of the most difficult to prepare and preserve. When rubbed into a paste with water, and a drop of liquor potassæ added, a characteristic odour of mice is immediately produced, due to the liberation of the conine by the potash.

100 lbs. of the plant yield from 55 to 60 ounces of extract.

100 lbs. of the leaves when dried weigh 21 lbs.

Used in the preparation of Pil. Conii Co.

Dose—2 to six grains.

Extractum Ergotæ Liquidum.

Liquid Extract of Ergot.

Ergot, crushed	...	...	1 pound
Distilled Water	...	...	6 pints
Rectified Spirit	...	...	6 fluid ounces.

Digest the ergot in 4 pints of the water for 12 hours. Draw off the infusion and repeat the digestion with the remainder of the water. Press out, strain, and evaporate the liquors by the heat of a water-bath to 11 fluid ounces: when cold, add the spirit. Allow it to stand for an hour to coagulate, then filter. The product should measure 16 fluid ounces.

This process has been altered in the present Pharmacopœia. The ergot is now digested cold instead of at 160° F., the percolation with ether omitted, and the quantity of water increased from $3\frac{1}{2}$ to 6 pints, and the quantity of spirit decreased. The omission of the ether is considered to be a mistake; it is still used by most pharmacists.

The spirit has been reduced from 50 to 37 per cent.

Used in the preparation of Ergotinum.

Dose—10 to 30 minims.

Extractum Euonymi Siccum.

Dry Extract of Euonymus.

Euonymus Bark, in No. 20 powder ... 1 pound

Dry Extract of Euonymus is commonly known as "Euonymin."

Rectified Spirit Distilled Water Sugar of Milk	}	...	... of each a sufficiency.

Moisten the euonymus with 8 fluid ounces of a mixture of equal parts of rectified spirit and distilled water, and pack in a percolator, then pour on gradually more of the diluted spirit until the euonymus is exhausted. Collect the liquor and evaporate or distil off the spirit. Incorporate so much sugar of milk with the still fluid extract—the actual amount having been ascertained experimentally—that the final product shall contain 80 per cent. of the dry extractive. Then evaporate over a water-bath until the mixture when cold becomes brittle. The mass may be powdered and kept in a well-corked bottle.

Dose—1 to 4 grains.

Extractum Filicis Liquidum.

Liquid Extract of Male Fern.

Male Fern, in coarse powder			2 pounds
Ether	...	...	... 4 pints, or a sufficiency.

Pack the male fern closely in a percolator, and pass the ether slowly through it until it passes colourless. Let the ether evaporate on a water-bath, or recover it by distillation and preserve the oily extract.

This extract may be made into an emulsion with a little fresh mucilage, powdered acacia, or compound tragacanth powder.

Dose—15 to 30 minims.

Extractum Gelsemii Alcoholicum.

Alcoholic Extract of Gelsemium.

Gelsemium, in No. 60 powder	...	1 pound
Rectified Spirit Distilled Water	... ...	of each a sufficiency.

Mix the gelsemium with 2 pints of the spirit, and macerate in a closed vessel for 48 hours: then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with water until 2 pints of liquor have been collected. Evaporate the percolated liquor by a water-bath until the extract has acquired a suitable consistence.

Dose—$\frac{1}{2}$ to 2 grains.

Extractum Gentianæ.

Extract of Gentian.

Gentian Root, sliced	...	...	1 pound
Boiling Distilled Water	...	...	1 gallon.

Infuse the gentian in the water for 2 hours; boil for 15 minutes; pour off, press, and strain. Then evaporate the liquor by a water-bath until the extract is of a suitable consistence for forming pills.

The gentian is first infused in order to disintegrate it, or render it porous, so as to thoroughly extract the active ingredients.

Cold water would make equally as good an extract medicinally, but little of the pectin would be dissolved, a principle which renders the extract so suitable for forming powders into pills.

Dose—2 to 10 grains.

Extractum Glycyrrhizæ.

Extract of Liquorice.

Liquorice Root, in No. 20 powder	...		...	1 pound
Distilled Water...	...	...	...	4 pints.

Macerate the liquorice root with 2 pints of the water for 12 hours, strain and press; again macerate the pressed marc with the remainder of the water for 6 hours, strain and press. Mix the strained liquors, heat them to 212° F. and strain through flannel; then evaporate by a water-bath until the extract is of a suitable consistence for forming pills.

The dried root is ordered. If made from the fresh root it cannot be strained bright, and is liable to ferment.

Used in the preparation of Conf. Sennæ; Dec. Aloes Co.; Mist. Sennæ Co.; Tinct. Aloes; and Trochisci Opii.

Dose—5 grains to 1 drachm.

Extractum Glycyrrhizæ Liquidum.

Liquid Extract of Liquorice.

Liquorice Root, in No. 20 powder			...	1 pound
Distilled Water	...	...	...	4 pints
Rectified Spirit	...	...	...	a sufficiency.

Macerate the liquorice root with 2 pints of the water for 12 hours, strain and press; again macerate the pressed marc with the remainder of the water for 6 hours, strain and press. Mix the strained liquors, heat them to 212° F., and strain through flannel; then evaporate by a water-bath, until it has acquired, when cold, a specific gravity of 1·160; add to this $\frac{1}{6}$th of its volume of rectified spirit; let the mixture stand for 12 hours, and filter.

In warm weather this preparation is liable to ferment.

2 fluid ounces equal 1 ounce of solid extract.

Used in the preparation of Mist. Sennæ Co., and Tinct. Chloroformi et Morphinæ.

Dose—1 fluid drachm.

Extractum Hæmatoxyli.

Extract of Logwood.

Logwood, in fine chips ...	...	...	1 pound
Boiling Distilled Water	...	...	1 gallon.

Infuse the logwood in the water for 24 hours, then boil down to one-half, strain, and evaporate to dryness by a water-bath, stirring with a wooden spatula. Iron vessels should not be used.

If iron vessels were used black tannate of iron would be formed.

The reason it is evaporated to dryness is because there is no adhesive matter to form a soft extract.

It may be distinguished from kino by its sweet taste.

Hydrochloric acid and sand will remove the red colouring matter from enamelled pans in which the extract has been evaporated.

Dose—10 to 30 grains.

Extractum Hamamelidis Liquidum.

Liquid Extract of Hamamelis.

Hamamelis Leaves, in No. 40 powder			20 ounces
Rectified Spirit Distilled Water	of each	...	... a sufficiency.

Moisten the powder with about 8 fluid ounces of a mixture of one volume of rectified spirit and two volumes of

distilled water. Pack the damp powder in a percolator, and pour on sufficient menstruum to saturate it thoroughly. When the liquid begins to drop, close the lower orifice of the percolator and macerate for 48 hours; then allow percolation to proceed, gradually adding menstruum until the hamamelis is exhausted. Reserve the first 17 fluid ounces of the percolate; evaporate or distil off the spirit from the remainder, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the liquid extract measure one pint.

Dose—2 to 5 minims.

Preparation—Ung. Hamamelidis, 1 fluid part in 10 parts.

Extractum Hydrastis Liquidum.

Liquid Extract of Hydrastis.

Hydrastis Rhizome, in No. 60 powder		20 ounces
Rectified Spirit Distilled Water	equal fluid parts	... a sufficiency.

Moisten the powder with about 8 fluid ounces of the diluted spirit. Pack the damp powder in a percolator, and pour on sufficient menstruum to saturate it thoroughly. When the liquid begins to drop, close the lower orifice of the percolator and macerate for 48 hours; then allow percolation to proceed, gradually adding menstruum until the hydrastis is exhausted. Reserve the first 17 fluid ounces of the percolate; evaporate or distil off the spirit from the remainder, and evaporate the residue to a soft extract; dissolve this in the reserved portion, and add enough menstruum to make the liquid extract measure one pint.

Dose—5 to 30 minims.

Extractum Hyoscyami.

Extract of Henbane.

The fresh leaves, flowering tops, and young branches of Henbane ... } 112 pounds.

Bruise in a stone mortar and press out the juice; heat it gradually to 130° F., and separate the green colouring matter by a calico filter. Heat the strained liquor to 200° F., to coagulate the albumen, and again filter. Evaporate the filtrate by a water-bath to the consistence of a thin syrup; then add to it the green colouring matter previously separated and passed through a hair sieve, and, stirring the whole assiduously, continue the evaporation at a temperature not exceeding 140° F., until the extract is of a suitable consistence for forming pills.

The chlorophyll is added to the green extracts to give them a suitable consistence for forming pills.

This is one of the most difficult of the green extracts to prepare.

An extract made from the fresh leaves alone will not keep well; the branches contain a peculiar principle, which renders the extract stable.

(100 lbs. of leaves yield about 5 lbs. of extract.)

Used in the preparation of Pil. Coloc. et Hyoscyami.

Dose—5 to 10 grains.

Extractum Jaborandi.

Extract of Jaborandi.

Jaborandi, in No. 40 powder... 1 pound
Proof Spirit } ... ... of each a sufficiency.
Distilled Water }

Mix the jaborandi with 2 pints of the spirit, and macerate

in a closed vessel for 48 hours ; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with water until 2 pints of liquid have been collected. Evaporate the percolated liquid until the extract has acquired a suitable consistence.

Dose—2 to 10 grains.

Extractum Jalapæ.

Extract of Jalap.

Jalap, in coarse powder	1 pound
Rectified Spirit	4 pints
Distilled Water...	1 gallon.

Macerate the jalap in the spirit for 7 days ; press out the tincture, then filter, and distil off the spirit, leaving a soft extract. Again macerate the residual jalap in the water for 4 hours, express, strain through flannel, and evaporate by a water-bath to a soft extract. Mix the two extracts, and evaporate at a temperature not exceeding 140° F. until it has acquired a suitable consistence for forming pills.

This extract is nothing more than a pill of the resin, the spirit dissolves out the resin, the water simply extracting the mucilage, which acts as an excipient for retaining the jalap resin in a diffusible condition.

(100 lbs. of jalap yield about 50 lbs. of extract.)

Dose—5 to 15 grains.

Extractum Krameriæ.

Extract of Rhatany.

Rhatany Root, in No. 40 powder...	1 pound
Distilled Water	a sufficiency.

Macerate the rhatany in a pint and a half of the water for 24 hours; then pack in a percolator, and add more distilled water, until twelve pints have been collected, or the rhatany is exhausted. Evaporate the liquor by a water-bath to dryness.

Dose.—5 to 20 grains.

Extractum Lactucæ.

Extract of Lettuce.

The flowering herb of Lettuce	...	112 pounds.

Bruise in a stone mortar, and press out the juice; heat it gradually to 130° F., and separate the green colouring matter by a calico filter. Heat the strained liquor to 200° F. to coagulate the albumen, and again filter. Evaporate the filtrate by a water-bath to the consistence of a thin syrup; then add to it the green colouring matter, previously separated and passed through a hair sieve, and, stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140° F. until the extract is of a suitable consistence for forming pills.

The extract made from the root is stronger than that made from the leaves.

(100 lbs. of the plant yield from 4 to 5 lbs. of extract.)

Dose—5 to 15 grains.

Extractum Lupuli.

Extract of Hop.

Synonym :—Extractum Humuli.

Hop		1 pound
Rectified Spirit...		1½ pint
Distilled Water		1 gallon.

Macerate the hop in the spirit for 7 days, press out the tincture, filter, and distil off the spirit, leaving a soft extract. Boil the residual hop with the water for 1 hour, press out the liquor, strain, and evaporate by a water-bath to the consistence of a soft extract. Mix the two extracts, and evaporate at a temperature not exceeding 140° F. until it has acquired a suitable consistence for forming pills.

The spirit dissolves out the resin and volatile oil; water, the lupuline and tannin.

(Hop yields 25 per cent. of extract.)

Dose—5 to 15 grains.

Extractum Mezerei Æthereum.

Ethereal Extract of Mezereon.

Mezereon Bark, cut small	1 pound
Rectified Spirit...	8 pints
Ether	1 pint.

Macerate the mezereon in 6 pints of the spirit for 3 days, with frequent agitation ; strain and press. To the residue of the mezereon add the remainder of the spirit, and again macerate for 3 days, with frequent agitation; strain and press. Mix and filter the strained liquors; recover the greater part of the spirit by distillation, evaporate what remains to the consistence of a soft extract ; put this into a stoppered bottle with the ether, and macerate for 24 hours, shaking them frequently. Decant the ethereal solution ; recover part of the ether by distillation, and evaporate what remains to the consistence of a soft extract.

Only that portion which is soluble in ether is required; if ether were used to exhaust the bark a large quantity would be lost by evaporation; the spirit is used for economy.

The ether dissolves out the neutral resin, without which the extract would be useless.

Used in the preparation of Lin. Sinapis Co.

Extractum Nucis Vomicæ.

Extract of Nux Vomica.

Nux Vomica	...	...	1 pound
Rectified Spirit	...	...	64 fluid ounces
Distilled Water	...	...	16 fluid ounces.

Heat the previously split seeds to a temperature of 212° F. for 3 hours, and then reduce to a fine powder. Mix the spirit with the water, and make the powdered nux vomica into a paste with 1 pint of the mixture. Allow this to macerate for 12 hours, then transfer to a percolator, and add another pint of the mixture. When this has percolated, pour on the remainder of the diluted spirit in successive portions; press the marc, filter the expressed liquor and add it to the percolated liquid.

Take of this liquid 1 fluid ounce, and estimate the amount of total alkaloid in the following way:—Evaporate almost to dryness over a water-bath, dissolve the residue in 2 fluid drachms of chloroform and half a fluid ounce of dilute sulphuric acid, with an equal bulk of water; agitate and warm gently. When the liquors have separated, draw off the chloroform, and add to the acid liquor excess of solution of ammonia and half a fluid ounce of chloroform; well agitate, gently warm, and, after the liquors have completely separated, transfer the chloroform to a weighed dish, evaporate over a water-bath, and dry for 1 hour at 212° F. Allow the residue of total alkaloid to cool, and then weigh.

Take of the percolated liquid as much as contains 131¼ grains of total alkaloid, distil off the spirit, and evaporate

over a water-bath until the extract weighs 2 ounces. This extract will contain 15 per cent. of total alkaloid.

Test.—10 grains of the extract when treated in the following manner should yield $1\frac{1}{2}$ grain of total alkaloid. Dissolve the extract in half a fluid ounce of water, heating gently if necessary, and add a drachm of carbonate of sodium previously dissolved in half a fluid ounce of water and half a fluid ounce of chloroform; agitate, warm gently, and separate the chloroform. Add to this half a fluid ounce of dilute sulphuric acid with an equal bulk of water; again agitate, warm, and separate the acid liquor from the chloroform. To this acid liquor add now an excess of ammonia, and agitate with half a fluid ounce of chloroform; when the liquors have separated, transfer the chloroform to a weighed dish, and evaporate the chloroform over a water-bath. Dry the residue for one hour, and weigh.

Used in the preparation of Tinct. Nucis Vomicæ.

Dose—$\frac{1}{4}$ to 1 grain.

Extractum Opii.

Extract of Opium.

Opium, in powder	...	...	...	1 pound
Distilled Water...	...	...	...	6 pints.

Macerate the opium in 2 pints of the water for 24 hours, and express the liquor. Thoroughly mix the residue of the opium with 2 pints of water, macerate again for 24 hours and express. Repeat the operation a third time. Mix the liquors, strain through flannel, and evaporate by a water-bath until the product weighs half a pound.

Test.—Analysed as described under "Opium," this extract should yield about 20 per cent. of morphine.

During the drying of opium or evaporation of the extract the narcotine is lost, the morphine being retained.

This extract is *twice* as strong as powdered opium.

It is used in the preparation of Ext. Opii Liquidum; Trochisci Opii; and Vinum Opii.

(100 lbs. of good opium yield 50 lbs. of extract.)

Dose—$\frac{1}{2}$ to 2 grains.

Extractum Opii Liquidum.

Liquid Extract of Opium.

Extract of Opium ...	...	...	1 ounce
Distilled Water ...	...	...	16 fluid ounces
Rectified Spirit ...	...	...	4 fluid ounces.

Macerate the extract of opium in the water for an hour, stirring frequently; then add the spirit, and filter. The product should measure a pint.

It contains 22 grains of extract of opium, nearly, in 1 fluid ounce, or one grain of extract in 22 minims. Specific gravity from 0·985 to 0·995.

If it be analysed as described under "Opium," this liquid extract should yield about 1 per cent. of morphine.

During the maceration of the opium in water, most of the resin and narcotine is lost, which improves the preparation.

Dose—10 to 40 minims.

Extractum Papaveris.

Extract of Poppy.

Poppy Capsules, freed from the seeds and in No. 20 powder	...	1 pound

Rectified Spirit	...	...	2 ounces
Boiling Distilled Water	...	...	a sufficiency.

Mix the poppy capsules with 2 pints of the water, and infuse for 24 hours, stirring frequently ; then pack in a percolator, and, adding more of the water, allow the liquor slowly to pass until about a gallon has been collected, or until the residue is exhausted. Evaporate the liquor by a water-bath until it is reduced to a pint, and, when cold, add the spirit. Let the mixture stand for 24 hours, then separate the clear liquor by filtration, and evaporate this by a water-bath until the extract has acquired a suitable consistence for forming pills.

Dose—2 to 5 grains.

Extractum Pareiræ.

Extract of Pareira.

Pareira Root, in No. 40 powder	...		1 pound
Boiling Distilled Water	...	...	a sufficiency.

Digest the pareira root with a pint of the water for 24 hours, then pack in a percolator, and, adding more of the water, allow the liquor slowly to pass until about a gallon has been collected, or the pareira is exhausted. Evaporate the liquor by a water-bath until the extract has acquired a suitable consistence for forming pills.

Used in the preparation of Ext. Pareiræ Liquidum.

Dose—10 to 30 grains.

Extractum Pareiræ Liquidum.

Liquid Extract of Pareira.

Extract of Pareira Distilled Water ... Rectified Spirit ...	}	... of each a sufficiency.

Dissolve 4 parts of the extract in a sufficient quantity of a mixture of 1 fluid part of rectified spirit and 3 parts of water to form 16 fluid parts of liquid extract. Filter, if necessary.

(*It contains* 1 *part of extract in* 4.)

The spirit is added to precipitate mucilaginous matter, and to preserve it.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Extractum Physostigmatis.

Extract of Calabar Bean.

Calabar Bean, in No. 40 powder	...	1 pound
Rectified Spirit...	...	4 pints.

Macerate the bean for 48 hours with one pint of the spirit in a closed vessel, agitating occasionally ; then transfer to a percolator, and, when the fluid ceases to pass, add the remainder of the spirit, so that it may slowly percolate through the powder. Subject the residue of the bean to pressure, adding the expressed liquor to the product of the percolation ; filter, distil off most of the spirit, and evaporate what is left in the retort by a water-bath to the consistence of a soft extract.

Used in the preparation of Physostigmina.

Dose—$\frac{1}{16}$ to $\frac{1}{4}$ grain.

Extractum Quassiæ.

Extract of Quassia.

Quassia Wood, rasped	... ...	1 pound
Distilled Water	... ...	a sufficiency.

Macerate the quassia with 8 fluid ounces of the water

for 12 hours; then pack in a percolator, and, adding more of the water, allow the liquor slowly to pass until the quassia is exhausted. Evaporate the liquor; filter before it becomes too thick; and again evaporate by a water-bath until the extract is of a suitable consistence for forming pills.

(100 lbs. of wood yield a little more than 2 lbs. of extract.)

Dose—3 to 5 grains.

Extractum Rhamni Frangulæ.

Extract of Rhamnus Frangula.

Synonym:—Extractum Frangulæ.

Rhamnus Frangula Bark, in No. 40 powder, 1 pound
Proof Spirit } ... ... of each a sufficiency.
Water }

Mix the bark with 2 pints of the spirit, and macerate in a closed vessel for 48 hours; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with water until 3 pints of liquor have been collected, or the bark is exhausted. Evaporate the percolated liquor by a water-bath until the extract has acquired a suitable consistence.

Dose—15 to 60 grains.

Extractum Rhamni Frangulæ Liquidum.

Liquid Extract of Rhamnus Frangula.

Rhamnus Frangula Bark, in coarse powder 1 pound
Rectified Spirit ... ... 4 fluid ounces
Distilled Water ... ... a sufficiency.

Boil the bark in 3 or 4 successive quantities of the water,

until exhausted. Evaporate the liquors by the heat of a water-bath to 12 fluid ounces; when cold add the spirit, allow the mixture to remain for some hours, then filter, and make up to the volume of 16 fluid ounces with distilled water.

Dose—1 to 4 fluid drachms.

Extractum Rhei.

Extract of Rhubarb.

Rhubarb Root, in No. 40 powder	...		1 pound
Proof Spirit ... }			
Distilled Water }	...	...	of each a sufficiency.

Mix the rhubarb with 3 pints of the spirit, and macerate in a closed vessel for 48 hours; then transfer to a percolator, and when the fluid ceases to pass, continue the percolation with water until 5 pints of liquor have been collected, or the rhubarb is exhausted. Evaporate the percolated liquor by a water-bath until the extract has acquired a suitable consistence for forming pills.

Good rhubarb yields 39 per cent of extract.

Dose—5 to 15 grains.

Extractum Sarsæ Liquidum.

Liquid Extract of Sarsaparilla.

Synonym :—Liquor Sarsæ.

Jamaica Sarsaparilla, in No. 40 powder	40 ounces
Proof Spirit	2 pints
Sugar	5 ounces
Distilled Water	12 pints.

Mix the sarsaparilla with the spirit, and macerate in a

closed vessel for 10 days; then press out 20 fluid ounces of liquor, and set this aside. Mix the pressed residue with the water, and macerate at 160° F. for 16 hours, then strain and press out the liquid, dissolve the sugar in this, and evaporate in a water-bath to about 18 fluid ounces. Mix the two liquids, and make up the volume to 40 fluid ounces by the addition of distilled water.

Water at 160° F. is used, so as not to dissolve out the starch.

One fluid ounce is equal to 16 ounces of Dec. Sarsæ Co., and when evaporated yields half an ounce of solid extract.

This preparation contains an increased proportion of product, as compared with that of Pharmacopœia of 1867. By the former method the Jamaica sarsaparilla was cut transversely, twice digested in water, and the mixed liquids, after filtration, were to be evaporated down to a certain specific gravity. Manufacturers on the large scale were accustomed to re-cut the sarsaparilla withdrawn from the first digestion, as it was imperfectly exhausted. The filtration enjoined was a process scarcely practicable, and probably never adopted. We have now the powdered root and a double treatment with proof spirit and water, the saccharated aqueous liquor, after evaporation, being mixed with the alcoholic. Filtration is obviated, and it will be observed that the spirit is utilized for extraction, and not simply as a preservative.

The sarsaparilla would be better exhausted by percolation with the spirit, by which means a bright liquor can be obtained.

1 fluid ounce of extract represents 1 ounce of the drug.

A small quantity of sugar is added to prevent precipitation.

Dose—2 to 4 fluid drachms.

Extractum Stramonii.

Extract of Stramonium.

Stramonium Seeds, in No. 40 powder		1 pound
Ether		1 pint, or a sufficiency
Distilled Water Proof Spirit ...	...	of each a sufficiency.

Shake the ether in a bottle with half a pint of the water, and after separation decant the ether. Pack the stramonium in a percolator and free it from its oil by passing the washed ether slowly through it. Having removed and rejected the ethereal solution, pour the spirit over the residue of the stramonium in the percolator, and allow it to pass through slowly until the powder is exhausted. Distil off most of the spirit from the tincture, and evaporate the residue by a water-bath until the extract has acquired a suitable consistence for forming pills.

The ether is first washed to free it from alcohol, which, if left in, would dissolve out some of the active principle along with the fixed oil. After the separation of the fixed oil, the spirit is able to thoroughly exhaust the seeds.

Dose—$\frac{1}{4}$ to $\frac{1}{2}$ grain.

Extractum Taraxaci.

Extract of Dandelion.

Fresh Dandelion Root	... ...	4 pounds.

Crush the root; press out the juice, and allow it to deposit; heat the clear liquor to 212° F., and maintain the temperature for 10 minutes; then strain, and evaporate by a water-bath at a temperature not exceeding 160° F., until the extract has acquired a suitable consistence for forming pills.

This extract contains no chlorophyll.

The temperature is maintained for 10 minutes, in order to allow time for the albumen to coagulate, as the juice is thick.

The quantity of extract obtained from the juice is greater from the end of September to the beginning of December. The extract becomes opaque by the deposit of inulin, which does not take place if the extract is made from the juice obtained in spring.

When required to be made into pills it should be dried.

(100 lbs. of root yield about 8 lbs. of extract.)

Dose—5 to 30 grains.

Extractum Taraxaci Liquidum.

Liquid Extract of Dandelion.

Dry Dandelion Root, in No. 20 powder	40 ounces
Proof Spirit	4 pints
Distilled Water	a sufficiency.

Mix the dandelion with the spirit, and macerate in a closed vessel for 48 hours; then press out 20 fluid ounces of liquid, and set this aside. Mix the pressed residue with 2 or 3 pints of the water, and again macerate for 48 hours; press out and strain the liquid; evaporate this by a water-bath to about 18 fluid ounces. Mix the two liquids, and make up the volume to 40 fluid ounces by the addition of distilled water; finally filter.

Dose—$\frac{1}{4}$ to 2 fluid drachms.

Fel Bovinum Purificatum.

Purified Ox Bile.

The purified Gall of the Ox, Bos Taurus.

Fresh Ox Bile	...	...	... 1 pint
Rectified Spirit	...	...	... a sufficiency.

Evaporate the bile to 5 fluid ounces, and mix it with half a pint of the spirit by agitation in a bottle, setting the mixture aside for 12 hours or until the sediment subsides. Decant the clear solution, and filter the remainder, washing the filter and contents with a little more of the spirit. Distil off most of the spirit from the mixed liquids, and evaporate the residue in a porcelain dish by the heat of a water-bath until it acquires a suitable consistence for forming pills.

It is a yellowish-green substance, composed of glycocholate and taurocholate of sodium, cholesterin and green colouring matter, having a taste partly sweet and partly bitter; it is soluble in water and in spirit. A solution of one or two grains of it in about a fluid drachm of water, when treated, first with a drop of freshly-made syrup consisting of 1 part of sugar and 4 of water, and then with sulphuric acid cautiously added until the precipitate at first formed is redissolved, gradually acquires a cherry-colour, which changes in succession to carmine, purple, and violet.

Its watery solution gives no precipitate on the addition of rectified spirit.

Dose—5 to 10 grains.

Gelatinum.

Gelatine.

The air-dried product of the action of boiling water on gelatigenous animal tissues, such as skin, tendons, ligaments, and bones.

Characters.—In translucent sheets or shreds. The solution in hot water is colourless and inodorous, and solidifies to a jelly on cooling. Gelatine is insoluble in alcohol and ether. It dissolves in acetic acid. Its aqueous solution is not precipitated by diluted acids, alum, acetate of lead, or perchloride of iron; it is precipitated by tannin.

Preparation in which Gelatine is used—Suppositoria Glycerini.

Glusidum.

Gluside.[1]

Synonyms:—Glucusimide; Benzoyl-sulphonic imide, $C_6H_4CO{\cdot}SO_2{\cdot}NH$.

A sweet imide derivable from the toluene of coal tar.

Characters and Tests.—A light, white, minutely crystalline powder, having an intensely sweet taste in dilute solutions. Heated it fuses, and then sublimes with partial decomposition. It is but slightly soluble in cold water or chloroform, more so in boiling water, rectified spirit, or glycerine. It is very soluble in diluted solution of ammonia, also in solution of bicarbonate of sodium with evolution of carbonic acid gas. The latter solution, when warmed and made neutral and evaporated to dryness, yields "soluble gluside" or "soluble saccharin," which is very soluble in water, one hundred parts of gluside yielding nearly one hundred and thirteen of neutral "soluble gluside." Neither gluside nor soluble gluside is blackened by strong sulphuric acid, even when the mixture is gently warmed for a short time. On evaporating either with excess of strong solution of soda, maintaining the residue in a state of semifusion for a few minutes, cooling, dissolving in water, faintly acidulating with hydrochloric acid, and adding a few drops of solution

[1] Gluside is commonly known as "Saccharin."

of perchloride of iron, a reddish-brown or purplish colour is produced.

Glycerinum. ($C_3H_5 3HO$).

Glycerine.

Hydrate of Glyceryl.

A sweet principle obtained by reaction of fats and fixed oils with aqueous fluids, and containing a small percentage of water.

This substance was first discovered by Scheele, and may be obtained by boiling hydrated oxide of lead with olive oil and water : the solution thus formed, freed from lead by sulphuretted hydrogen, filtered, evaporated to the consistency of syrup, and then exposed *in vacuo* over sulphuric acid until it no longer loses weight, leaves the glycerine.

It is now produced in large quantities as a by-product in the manufacture of soap and candles. When prepared from soap, it often contains chloride of sodium as an impurity. It should give no precipitate with nitrate of silver (*absence of chlorides*). Glycerine is a colourless, neutral, inodorous fluid, of a sweet taste, sp. gr. 1·28 (official about 1·25) soluble in all proportions in alcohol and water. Sulphuric acid does not carbonise it in the cold ; it is thus distinguished from sucrose. When exposed to damp air, glycerine absorbs a considerable amount of moisture. When heated alone or with sulphuric acid, vapours of acrolein are evolved, which are very irritating to the eyes and nose. The formula of acrolein or acrylic aldehyd is C_3H_4O. It is glycerine from which 2 molecules of water have been abstracted.

$C_3H_8O_3$ Glycerine.
H_4O_2 two molecules of water.

C_3H_4O Acrolein.

Pure glycerine sometimes forms crystals, at a temperature below the freezing point of water.

It may be distilled without decomposition in vacuo, or in a current of super-heated steam at a temperature between 400° and 500° F.

It is not susceptible to vinous fermentation, but when left in a warm place for several months, mixed with a little yeast, it produces propionic acid. Distilled with sulphuric acid and black oxide of manganese it yields carbonic and formic acids. Mixed with twice its weight of sulphuric acid there is a considerable elevation of temperature, and after the mixture has cooled, if it be diluted, saturated with milk of lime and filtered, it yields on evaporation, crystals of a salt of lime containing sulphoglyceric acid.

Nitric acid decomposes glycerine, and among the products are oxalic and carbonic acids. When glycerine is dropped into equal parts of strong nitric and sulphuric acids, a heavy oily liquid is formed, known as *nitro-glycerine*. It is a powerfully explosive substance, and is said to possess strongly poisonous properties.

Nitroglycerine is official in the form of Tabellæ Nitroglycerini, each weighing $2\frac{1}{2}$ grains, and containing 1-100th of a grain of nitroglycerine.

Dynamite is a mixture of 75 parts of nitroglycerine and 25 parts of porous silica.

Dose of Glycerine.—1 to 2 drachms.

Used in the preparation of—

Extractum Cinchonæ Liquid.
Glycerinum Acidi Carbolici
,, ,, Gallici
,, ,, Tannici
,, Aluminis
,, Amyli
,, Boracis
,, Plumbi Subacet.
,, Tragacanthæ
Lamellæ, in all
Linimentum Iodi
,, Potassii Iodidi cum Sapone
Mel Boracis
Pilula Aloes et Myrrhæ
,, Rhei Composita
,, Saponis Composita
Tinctura Kino
Unguentum Iodi.

Glycerina.

Glycerines.

There are 8 official glycerines.

Glycerinum Acidi Carbolici.

Glycerine of Carbolic Acid.

Carbolic Acid...	...	...	1 ounce
Glycerine	...	...	4 fluid ounces.

Rub them together in a mortar until the acid is dissolved; or the mixture may be warmed.

Glycerinum Acidi Gallici.

Glycerine of Gallic Acid.

Gallic Acid	...	...	1 ounce
Glycerine	...	...	4 fluid ounces.

Stir them together in a porcelain dish, and apply a temperature not exceeding that of a water-bath until complete solution is effected.

If overheated pyrogallol is formed.

Glycerinum Acidi Tannici.

Glycerine of Tannic Acid.

Tannic Acid	...	...	1 ounce
Glycerine	...	..	4 fluid ounces.

Stir them together in a porcelain dish, and apply a temperature not exceeding that of a water-bath until complete solution is effected.

If overheated pyrogallol is formed.

Glycerinum Aluminis.

Glycerine of Alum.

Alum in powder	...	...	1 ounce
Glycerine	...	...	5 fluid 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.

Glycerinum Amyli.

Glycerine of Starch.

Starch ...	...	...	1 ounce
Glycerine	...	...	5 fluid ounces
Distilled Water ...	...	...	3 fluid 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.

Used in the preparation of the following suppositories :

Acidi Carbolici cum Sapone, Acidi Tannici cum Sapone, and Morphinæ cum Sapone.

Glycerinum Boracis.

Glycerine of Borax.

Borax, in powder	...	...	1 ounce
Glycerine	...	...	4 fluid ounces
Distilled Water...	...	...	2 fluid ounces.

Rub together in a mortar until the borax is dissolved ; or heat gently until solution is effected.

If this preparation be mixed with bicarbonate of sodium,

carbonic acid is evolved, due to the glycerine acting on the borax, and rendering the solution acid.

Glycerinum Plumbi Subacetatis.

Glycerine of Subacetate of Lead.

Acetate of Lead	5	ounces
Oxide of Lead, in powder ...	$3\frac{1}{2}$	ounces
Glycerine	1	pint
Distilled Water	12	fluid ounces.

Mix together and boil for a quarter of an hour; then filter and evaporate until the water is dissipated.

Some authors suggest boiling the lead salts with half the quantity of water, then filtering and mixing the product with the glycerine, and evaporating.

Used in the preparation of Ung. Glycerini Plumb. Subacetatis.

Glycerinum Tragacanthæ.

Glycerine of Tragacanth.

Tragacanth, in powder	110	grains
Glycerine	1	fluid ounce
Distilled Water...	74	fluid grains.

Mix the tragacanth with the glycerine in a mortar, add the water, and rub until a translucent homogeneous jelly is produced.

This is largely used as a pill excipient.

Hirudo.

Leech.

Sanguisuga officinalis, and Sanguisuga medicinalis.
Class, Vermes. Order, Annulata.

Leeches are aquatic invertebrate animals with an elongated roundish and slightly flattened body. The anterior end terminates in a disc having a mouth containing several jaws, provided with finely pointed teeth. They are hermaphrodite. Leeches should be kept in clean river water, and the temperature maintained as near as possible at 60° F.; rapid changes of temperature are injurious to them.

Infusa.

Infusions.

There are 28 official infusions.

They are aqueous solutions of the constituents of drugs obtained without boiling.

They are ordered to be made by infusing the drugs in cold or boiling distilled water in a covered vessel for a definite period, and straining.

Two are made with cold water, viz., quassia and calumba; two with water at 120° F., viz., chirata and cusparia; all the rest are made with boiling water.

The time allowed varies with the nature of the drug.

If infusions are allowed to stand longer than they are ordered, they are injured by the mucilaginous matter being dissolved out.

Iron vessels must not be used for substances containing astringent matters, as the tannic acid contained in them would attack the iron.

Infusions are preferable to decoctions of certain drugs which contain volatile matters.

Many of the infusions, which are perfectly clear when freshly prepared, become turbid in a very short time by the deposition of vegetable albumen, &c.

Infusions should not be kept more than two or three days, as they readily decompose.

When it is required to preserve them for several days, they should be bottled while hot, the bottles being quite filled and tightly corked, and kept inverted in a cool place. The addition of a little alcohol will answer every purpose, providing it does not interfere with the medicinal properties of the infusion.

Table of strengths and lengths of time required to stand:—

ONE HOUR.

Inf.	Cinch. Acid	½ oz.	to 10 ozs.
,,	Cuspariæ ...	½ oz.	,, ,,
,,	Lupuli... ...	½ oz.	,, ,,
,,	Uvæ Ursi ...	½ oz.	,, ,,
,,	Valerianæ...	¼ oz.	,, ,,

FIFTEEN MINUTES.

Inf.	Anthemidis	½ oz.	to 10 ozs.
,,	Aurantii ...	½ oz.	,, ,,
,,	,, Co.	¼ oz.	,, ,,
,,	Cusso... ...	½ oz.	,, 8 ozs.
,,	Digitalis	28 grs.	,, 10 ,,

HALF-AN-HOUR.

Inf.	Buchu ...	½ oz.	to 10 ozs.
,,	Calumbæ...	½ oz.	,, ,,
,,	Cascarillæ	1 oz.	,, ,,
,,	Catechu ...	160 grs.	,, ,,
,,	Caryophylli	¼ oz.	,, ,,
,,	Chiratæ ...	¼ oz.	,, ,,
,,	Ergotæ ...	¼ oz.	,, ,,
,,	GentianæCo.	55 grs.	,, ,,
,,	Jaborandi	½ oz.	,, ,,
,,	Krameriæ	½ oz.	,, ,,
,,	Maticæ ...	½ oz.	,, ,,
,,	Quassiæ ...	55 grs.	,, ,,
,,	Rhei... ...	¼ oz.	,, ,,
,,	Rosæ Acidum	¼ oz.	,, ,,
,,	Senegæ ...	½ oz.	,, ,,
,,	Sennæ ...	1 oz.	,, ,,
,,	Serpentariæ	¼ oz.	,, ,,

TWO HOURS.

Inf. Lini, 150 grs. to 10 ozs.

Infusum Anthemidis.

Infusion of Chamomile.

Chamomile Flowers	... ...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for fifteen minutes, and strain.

Dose—1 to 4 fluid ounces.

Infusum Aurantii.

Infusion of Orange Peel.

Bitter-Orange Peel, cut small	...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for fifteen minutes, and strain.

Dose—1 to 2 fluid ounces.

Infusum Aurantii Compositum.

Compound Infusion of Orange Peel.

Bitter-Orange Peel, cut small	...	¼ ounce
Fresh Lemon Peel, cut small	...	56 grains
Cloves, bruised	... ...	28 grains
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for fifteen minutes, and strain.

Dose—1 to 2 fluid ounces.

Infusum Buchu.

Infusion of Buchu.

Buchu Leaves, bruised	...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

The leaves are ordered to be bruised, because, being covered with a kind of varnish, they will not admit moisture.

This infusion is difficult to filter in consequence of the quantity of mucilage it contains.

Dose—1 to 4 fluid ounces.

Infusum Calumbæ.

Infusion of Calumba.

Calumba Root, cut small ...	½ ounce
Cold Distilled Water	10 fluid ounces.

Macerate in a covered vessel for half an hour, and strain.

Cold water is used, so as not to dissolve out the starch. It contains calumbate of berberine, and may be prescribed with preparations of iron, as it contains no tannic or gallic acid. This infusion becomes mouldy by keeping. An improved method of preparation is to prepare the infusion as ordered in the Pharmacopœia, and having poured it off from the calumba root, to boil it and strain, when the infusion will keep for any length of time; the boiling coagulates the albumen which the cold water dissolved.

Dose—1 to 2 fluid ounces.

Infusum Caryophylli.

Infusion of Cloves.

Cloves, bruised	¼ ounce
Boiling Distilled Water... ...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 4 fluid ounces.

Infusum Cascarillæ.

Infusion of Cascarilla.

Cascarilla Bark, in No. 20 powder	1 ounce
Boiling Distilled Water	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

This infusion quickly spoils; the addition of a little tincture of cascarilla will keep it. The infusion is more

aromatic than the tincture. Acids or alkalies can be prescribed with it.

Dose—1 to 2 fluid ounces.

Infusum Catechu.

Infusion of Catechu.

Catechu, in coarse powder	...	160 grains
Cinnamon Bark, bruised	...	30 grains
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Chiratæ.

Infusion of Chiretta.

Chiretta, cut mall	... ...	$\frac{1}{4}$ ounce
Distilled Water, at 120° F.	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Distilled water at 120° F. is used so as not to dissolve out the starch or coagulate the albumen. If a higher temperature were used, one of the active principles would be volatilised.

Salts of iron may be prescribed with this infusion, as it contains no tannic acid.

Dose—1 to 2 fluid ounces.

Infusum Cinchonæ Acidum.

Acid Infusion of Cinchona.

Synonym :—Infusum Cinchonæ.

Red Cinchona Bark, in No. 40 powder		$\frac{1}{2}$ ounce
Aromatic Sulphuric Acid	... ...	1 fluid drachm
Boiling Distilled Water	... ...	10 fluid ounces.

Infuse in a covered vessel for one hour, and strain.

A portion only of the kinates of quinine, cinchonine, &c., are extracted, the greater portion of the cinchonic alkaloids are left in the marc.

Dose—1 to 2 fluid ounces.

Infusum Cuspariæ.

Infusion of Cusparia.

Cusparia Bark, in No. 40 powder		½ ounce
Distilled Water, at 120° F.	...	10 fluid ounces.

Infuse in a covered vessel for one hour, and strain.

A higher temperature than 120° F. would drive off the volatile oil.

Dose—1 to 2 fluid ounces.

Infusum Cusso.

Infusion of Kousso.

Kousso, in coarse powder	...	½ ounce
Boiling Distilled Water	...	8 fluid ounces.

Infuse in a covered vessel for fifteen minutes. Not to be strained.

This is ordered not to be strained, but merely poured off from the stalks. When prescribed with perchloride of iron a green precipitate is formed, due to the action of the iron on the koussine.

Kousso does not contain sufficient tannin to produce a black colour with salts of iron.

Dose—4 to 8 fluid ounces.

Infusum Digitalis.

Infusion of Foxglove.

Foxglove Leaves, dried ...	...	28 grains
Boiling Distilled Water...	...	10 fluid ounces.

Infuse in a covered vessel for fifteen minutes, and strain.

It is supposed to be the most effectual preparation of digitalis.

Dose—2 to 4 fluid drachms.

Infusum Ergotæ

Infusion of Ergot.

Ergot, crushed ...	...	... $\frac{1}{4}$ ounce
Boiling Distilled Water ...	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Gentianæ Compositum

Compound Infusion 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 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Jaborandi.

Infusion of Jaborandi.

Jaborandi, cut small	...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Krameriæ.

Infusion of Rhatany.

Rhatany Root, in No. 40 powder		½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Lini.

Infusion of Linseed.

Linseed	...	150 grains
Dried Liquorice Root, in No. 20 powder		50 grains
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for 2 hours, and strain.

The seeds are not to be crushed, as the mucilage is contained in the outer coats. The oil is not required. It is infused for 2 hours, in order to dissolve out the colloid matter.

Infusum Lupuli.

Infusion of Hop.

Hop	...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for one hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Maticæ.

Infusion of Matico.

Matico Leaves, cut small	...	½ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 4 fluid ounces.

Infusum Quassiæ.

Infusion of Quassia.

Quassia Wood, in chips	...	55 grains
Cold Distilled Water	...	10 fluid ounces

Macerate in a covered vessel for half an hour, and strain.

Cold distilled water is used, in consequence of the active principle, *quassin,* being as soluble in cold as in hot water. It is also found to keep better when made with cold water.

Dose—1 to 2 fluid ounces.

Infusum Rhei.

Infusion of Rhubarb.

Rhubarb Root, in thin slices		¼ ounce
Boiling Distilled Water	...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

The boiling water extracts resin, tannic, gallic, and

chrysophanic acids, and extractive matter. As the liquid cools it becomes turbid, owing to the deposition of chrysophanic acid.

Dose—1 to 2 fluid ounces.

Infusum Rosæ Acidum.

Acid Infusion of Roses.

Dried Red Rose Petals, broken up	¼ ounce
Diluted Sulphuric Acid	1 fluid drachm
Boiling Distilled Water	10 fluid ounces.

Add the acid to the water, infuse the petals in the mixture in a covered vessel for half an hour, and strain.

The red rose petals are here used, because they contain the most colouring and extractive matter. If this be dispensed with quinine it becomes turbid, owing to the deposition of tannate of quinine.

It contains 1 drachm of diluted sulphuric acid in 10 fluid ounces.

Dose—1 to 2 fluid ounces.

Infusum Senegæ.

Infusion of Senega.

Senega Root, in No. 20 powder	½ ounce
Boiling Distilled Water ...	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

The infusion becomes turbid on keeping, due to the deposition of saponin.

Dose—1 to 2 fluid ounces.

Infusum Sennæ.

Infusion of Senna.

Senna	1 ounce
Ginger, sliced	28 grains
Boiling Distilled Water	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

It is used in the preparation of Mistura Sennæ Co.

It quickly spoils ; 1 grain of nitrate of potassium to each ounce of the infusion will preserve it.

From 10 ounces of infusion, only 7 ounces drain out.

Dose—1 to 2 fluid ounces.

Infusum Serpentariæ.

Infusion of Serpentary.

Serpentary Rhizome, in No. 20 powder	$\frac{1}{4}$ ounce
Boiling Distilled Water	10 fluid ounces.

Infuse in a covered vessel for half an hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Uvæ Ursi.

Infusion of Bearberry.

Bearberry Leaves, bruised... ...	$\frac{1}{2}$ ounce
Boiling Distilled Water	10 fluid ounces.

Infuse in a covered vessel for one hour, and strain.

Dose—1 to 2 fluid ounces.

Infusum Valerianæ.

Infusion of Valerian.

Valerian Rhizome, bruised	...	¼ ounce
Boiling Distilled Water ...	...	10 fluid ounces.

Infuse in a covered vessel for one hour, and strain.

It contains a small quantity of volatile oil, valerianate of potassium and extractive matter.

Dose—1 to 2 fluid ounces.

Hypodermic Injections.

These are strong preparations intended to be injected beneath the skin by means of a syringe.

There are three preparations under this head in the present Pharmacopœia.

Injectio Apomorphinæ Hypodermica.

Hypodermic Injection of Apomorphine.

Hydrochlorate of Apomorphine	...	2 grains
Camphor Water	...	100 minims.

Dissolve and filter. The solution should be made as required for use. (1 in 50.)

This solution rapidly changes colour, first to green, then to blue. The presence of a little hydrochloric acid or carbolic acid will preserve its activity.

Dose, by subcutaneous injection—2 to 8 minims.

Injectio Ergotini Hypodermica.

Hypodermic Injection of Ergotin.

Ergotin	...	100 grains
Camphor Water	...	200 fluid grains.

Dissolve by stirring them together. The solution should be made as required for use. (1 in 3 by weight.)

Dose, by subcutaneous injection—3 to 10 minims.

Injectio Morphinæ Hypodermica.

Hypodermic Injection of Morphine.

A solution of acetate of morphine containing one grain of acetate in ten minims of the injection.

Hydrochlorate of Morphine...		92 grains
Solution of Ammonia Acetic Acid ... Distilled Water ...	...	of each a sufficiency.

Dissolve the hydrochlorate of morphine in 2 ounces of distilled water, aiding the solution by gently heating; then add solution of ammonia so as to precipitate the morphine, and render the liquid slightly alkaline; allow it to cool; collect the precipitate on a filter, wash it with distilled water, and allow it to drain; then transfer the morphine to a small porcelain dish with about an ounce of distilled water, apply heat gently, and carefully add acetic acid until the morphine is dissolved, and a very slightly acid solution is formed. Add now sufficient distilled water to make the solution measure exactly 2 fluid ounces. Filter, and preserve the product in a stoppered bottle excluded from the light. (1 in 10.)

If this solution be long kept it will deposit morphine and become alkaline; this may be remedied by adding very carefully a few drops of acetic acid, and warming the mixture.

Dose, by subcutaneous injection—1 to 5 minims.

Lac.

Milk.

The fresh Milk of the Cow, Bos Taurus.

Milk is an opaque white fluid, with a faintly alkaline reaction, bland and sweet taste, and peculiar odour. Specific gravity (about) 1·030. Examined under the microscope it is seen to be a clear transparent fluid, with numerous minute fat globules floating in the liquid.

Composition.—The following represents something like the average composition of cows' milk.

Water	88·0
Fat	3·0
Albumenoids	3.5
Sugar	5·0
Salts	·5
	100·0

Milk possesses remarkable emulsifying properties.
Used in the preparation of Mist. Scammonii.

Lamellæ Atropinæ.

Discs of Atropine.

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ grain, and containing $\frac{1}{5000}$ grain of sulphate of atropine.

Lamellæ Cocainæ.

Discs of Cocaine.

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ grain, and containing $\frac{1}{200}$ grain of hydrochlorate of cocaine.

Lamellæ Physostigminæ.

Discs of Physostigmine.

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ grain, and containing $\frac{1}{1000}$ grain of physostigmine.

Limonis Succus.

Lemon Juice.

The freshly expressed juice of the ripe fruit of Citrus Limonum.

It is a slightly turbid yellowish liquid, with a sharp acid taste. Sp. gr. 1·035 to 1·045.

Quantity of citric acid in 1 fluid ounce, 36 to 46 grains.

It readily undergoes decomposition, and various methods have been proposed to preserve it; addition of alcohol, preserving in bottles with a film of oil to exclude air, while others employ bisulphite of sodium, but addition of alcohol seems to be the most satisfactory method.

Used in the preparation of Syrupus Limonis.

Linimenta.

Liniments.

There are 16 official liniments, 11 of which contain camphor, the exceptions being Lin. Ammoniæ, Crotonis, Calcis, Iodi, and Potasii Iodidi cum Sapone.

In the preparation of 3 of the liniments, chemical changes ake place, viz., Ammonia, Lime, and Mercury.

Linimentum Aconiti.

Liniment of Aconite.

Aconite Root, in No. 40 powder ...	20 ounces
Camphor	1 ounce
Rectified Spirit, a sufficiency to make	30 fluid ounces.

Mix the aconite with 20 ounces of the spirit, and macerate in a closed vessel for 3 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 30 fluid ounces.

(1 *in* $1\frac{1}{2}$.)

The spirit should be recovered by distillation.

Linimentum Ammoniæ.

Liniment of Ammonia.

Synonym :—Hartshorn and Oil.

Solution of Ammonia ...	1 fluid ounce
Olive Oil	3 fluid ounces.

Mix with agitation until the thick emulsion at first produced becomes of such consistence that it can be poured from a bottle.

Chemical action takes place, a soap, oleate of ammonium and glycerine being formed.

(1 *part of solution of ammonia in* 4.)

Linimentum Belladonnæ.

Liniment of Belladonna.

Belladonna Root, in No. 40 powder	20 ounces
Camphor	1 ounce
Rectified spirit, a sufficiency to make	30 fluid ounces.

Mix the belladonna with 20 fluid ounces of the spirit and macerate in a closed vessel for 3 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 30 fluid ounces.

(1 *in* 1½.)

Linimentum Calcis.

Liniment of Lime.

Solution of Lime }	... ...	equal parts.
Olive Oil }		

Mix together with agitation.

Chemical action takes place, a soap, oleate of calcium and glycerine, being formed.

Similar to a celebrated application for burns and scalds, used at the Carron Ironworks, in which linseed oil is used instead of olive oil.

(1 *part of solution of lime in* 2.)

Linimentum Camphoræ.

Liniment of Camphor.

Synonyms:—Camphorated Liniment; Camphorated Oil.

Camphor	1 ounce
Olive Oil	4 fluid ounces.

Dissolve the camphor in the oil.

(1 *part of camphor in* 5.)

Used in the preparation of Lin. Chloroformi, Hydrargyri, and Terebinthinæ Aceticum.

Linimentum Camphoræ Compositum.

Compound Liniment of Camphor.

Camphor	$2\frac{1}{2}$ ounces
Oil of Lavender	1 fluid drachm
Strong Solution of Ammonia	5 fluid ounces
Rectified Spirit	15 fluid ounces.

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.

If the ammonia be added suddenly, the camphor might be thrown down.

(*About* 1 *part of camphor in* 9.)

Linimentum Chloroformi.

Liniment of Chloroform.

Linimnte of Camphor Chloroform	... equal parts.

Mix.

(1 *part of chloroform in* 2.)

The oil in the liniment of camphor prevents the evaporation of the chloroform.

Linimentum Crotonis.

Liniment of Croton Oil.

Croton Oil		1 fluid ounce
Oil of Cajuput Rectified Spirit	...	of each $3\frac{1}{2}$ fluid ounces.

Mix.

(1 *part of croton oil in* 8.)

Linimentum Hydrargyri.

Liniment of Mercury.

Ointment of Mercury		1 ounce
Solution of Ammonia Liniment of Camphor	of each	1 fluid ounce.

Mix the solution of ammonia with one half of the liniment of camphor; rub the mercurial ointment with the other half; then mix them together.

Linimentum Iodi.

Liniment of Iodine.

Iodine	$1\frac{1}{4}$ ounce
Iodide of Potassium	$\frac{1}{2}$ ounce
Glycerine	$\frac{1}{4}$ ounce
Rectified Spirit	10 fluid ounces.

Dissolve the iodine, iodide of potassium, and glycerine in the spirit.

The iodide of potassium is used to render the iodine more soluble.

Contains 5 times as much iodine as the tincture.

(*About* 1 *part of iodine in* 9.)

Linimentum Opii.

Liniment of Opium.

Synonym :—Anodyne Liniment.

Tincture of Opium Liniment of Soap	}	...	... equal parts.

Mix and filter.

(1 *part of tincture of opium in* 2.)

Linimentum Potassii Iodidi cum Sapone.

Liniment of Iodide of Potassium and Soap.

Curd Soap, cut small	...	...	2 ounces
Iodide of Potassium	...	...	$1\frac{1}{2}$ ounces
Glycerine ...	...	...	1 fluid ounce
Oil of Lemon ...	...	...	1 fluid drachm
Distilled Water ...	...	...	10 fluid ounces.

Reduce the soap to fine shreds, and mix this with the water and glycerine in a porcelain dish over a water-bath. When the soap is dissolved, pour the liquid into a mortar in which the iodide of potassium has previously been powdered. Mix briskly and continue the trituration until the mixture is cold. Set aside for an hour ; then rub well the oil of lemon into the cream-like product.

Curd soap answers better than hard soap, and makes it in the form of a cream. If made with oleic acid soap, it forms a jelly-like mixture, which keeps well.

($54\frac{1}{2}$ *grains of iodide of potassium in* 1 *fluid ounce.*)

Linimentum Saponis.

Liniment of Soap.

Synonym :—Opodeldoc.

Hard Soap, in fine shavings ...	2 ounces
Camphor	1 ounce
Oil of Rosemary	3 fluid drachms
Rectified Spirit...	16 fluid ounces
Distilled Water	4 fluid ounces.

Mix the water with the spirit and add the oil of rosemary, the soap, and the camphor. Macerate for seven days at a temperature not exceeding 70° F. with occasional agitation, and filter.

In making this liniment the whole of the soap is not dissolved. A temperature not exceeding 70° F. is employed, so that the liniment shall remain clear during cold weather ; above that temperature the stearate of sodium contained in the soap would dissolve, and when the temperature fell below 70° F. it would be deposited.

Curd soap, in consequence of it being chiefly stearate of sodium, must not be used.

There remains on the filter about $\frac{1}{5}$ of the soap employed.

Used in the preparation of Linimentum Opii.

Linimentum Sinapis Compositum.

Compound Liniment of Mustard.

Oil of Mustard	1 fluid drachm
Ethereal Extract of Mezereon ...	40 grains
Camphor	120 grains
Castor Oil	5 fluid drachms
Rectified Spirit	4 fluid ounces.

Dissolve the extract of mezereon and camphor in the spirit, and add the oil of mustard and castor oil.

(1 *part of oil of mustard in* 40.)

Linimentum Terebinthinæ.

Liniment of Turpentine.

Soft Soap ...	...	2 ounces
Distilled Water	...	2 fluid ounces
Camphor ...	...	1 ounce
Oil of Turpentine ...	...	16 fluid ounces.

Mix the soap with the water; dissolve the camphor in the oil of turpentine; then rub these fluids together until they are thoroughly mixed.

The consistence of this liniment varies considerably. If the turpentine with camphor be added a little at a time, a semi-solid results, which cannot be put into a bottle. If the turpentine be added more at a time a liquid is the result.

Linimentum Terebinthinæ Aceticum.

Liniment of Turpentine and Acetic Acid.

Oil of Turpentine ...	...	4 fluid ounces
Glacial Acetic Acid	...	1 ounce
Liniment of Camphor	...	4 fluid ounces.

Mix.

Liquores.

Solutions.

There are 51 official solutions, which are all clear liquids.

Liquor Acidi Chromici.

Solution of Chromic Acid.

A solution containing the equivalent of 25 per cent. of anhydrous chromic acid, or chromic anhydride, CrO^3; or 29·5 per cent. of real chromic acid, $H_2\ CrO_4$.

Chromic Acid	...	...	1 ounce
Distilled Water	...	...	3 fluid ounces.

Dissolve.

It is an orange-red, inodorous, caustic, strongly acid liquid. Specific gravity 1·185. One fluid drachm contains chromic acid equivalent to nearly 18 grains of chromic anhydride, CrO_3.

Liquor Ammoniæ.

Solution of Ammonia.

Ammoniacal gas, NH_3, dissolved in water.

Strong Solution of Ammonia			1 pint
Distilled Water	...	...	2 pints.

Mix, and preserve in a stoppered bottle.

Specific gravity 0·959. 85 grains by weight requires for neutralisation 500 grain-measures of the volumetric solution of oxalic acid, corresponding to 10 per cent. by weight of ammonia gas, NH_3.

One fluid drachm contains 5·2 grains of ammonia gas.

Used in the preparation of Linimentum Ammoniæ; Lin. Hydrargyri; and Tinctura Quininæ Ammoniata.

Liquor Ammoniæ Fortior.

Strong Solution of Ammonia.

Ammoniacal gas, NH_3, dissolved in water, and consti-

tuting 32·5 per cent. of the solution. It may be obtained by the following process:—

Chloride of Ammonium, in coarse powder	...	3 pounds
Slaked Lime	...	4 pounds
Distilled Water ...	...	32 fluid ounces.

Mix the lime with the chloride of ammonium, and introduce the mixture into an iron bottle, placed in a metal pot surrounded by sand. Connect the iron tube, which screws air-tight into the bottle in the usual manner, by corks, glass bottles, and caoutchouc collars, with a Woulf's bottle capable of holding a pint; connect this with a second Woulf's bottle of the same size, the second bottle with a flask or other vessel of the capacity of three pints in which 22 ounces of the distilled water is placed, and this vessel, by means of a tube bent twice at right angles, with an ordinary bottle containing the remaining 10 ounces of distilled water. Bottles 1 and 2 are empty, and the latter and the vessel which contains the 22 ounces of distilled water are furnished each with a siphon safety tube charged with a very short column of mercury. The heat of a fire, which should be very gradually raised, is now to be applied to the metal pot, and continued until bubbles of condensible gas cease to escape from the extremity of the glass tube which dips into the water of the flask. The process being terminated, the latter vessel will contain about 43 fluid ounces of strong solution of ammonia.

Bottles 1 and 2 will now include, the first about sixteen the second about ten fluid ounces of a coloured ammoniacal liquid. Place this in a flask closed by a cork, which should be perforated by a siphon safety tube containing a little mercury, and also by a second tube bent twice at right angles, and made to pass to the bottom of the terminal bottle used in the preceding process. Apply heat to the flask until the coloured liquid it contains is reduced to three-fourths of its original bulk. The product now con-

tained in the terminal bottle will be nearly of the strength of solution of ammonia, and may be made exactly so by the addition of the proper quantity of distilled water or of strong solution of ammonia.

It is a colourless liquid, with a characteristic and very pungent odour, and strong alkaline reaction. Specific gravity 0·891. 52·3 grains by weight requires for neutralisation 1000 grain-measures of the volumetric solution of oxalic acid. One fluid drachm contains 15·83 grains of ammonia gas, NH_3. When diluted with four times its volume of distilled water, it does not give precipitates with solution of lime (*absence of carbonates*), oxalate of ammonium (*absence of lime*), sulphydrate of ammonium (*absence of iron*), or ammonio-sulphate of copper (*absence of sulphydrate*); and when treated with an excess of nitric acid, is not rendered turbid by nitrate of silver or by chloride of barium (*absence of chlorides and sulphates*).

Strong Solution of Ammonia is used in the following preparations :—Ammonii Phosphas; Lin. Camphoræ Co.; Liquor Ammoniæ; Liquor Ammonii Citratis Fort.; Sp. Ammoniæ Aromaticus; Sp. Ammoniæ Fœtidus; and Tinctura Opii Ammoniata.

Liquor Ammonii Acetatis.

Solution of Acetate of Ammonium.

Synonyms :—Liquor Ammoniæ Acetatis; Solution of Acetate of Ammonia; Mindererus Spirit.

Acetate of ammonium, $NH_4C_2H_3O_2$, dissolved in water.

Strong Solution of Acetate of Ammonium	4 fluid ounces
Distilled Water, sufficient to produce	20 fluid ounces.

Mix.

On keeping, it deposits a fungoid growth.

The solution should be stored in glass bottles free from lead. Sp. gr. 1·022.

Dose—2 to 6 fluid drachms.

Liquor Ammonii Acetatis Fortior.

Strong Solution of Acetate of Ammonium.

Carbonate of Ammonium	...	15½ ounces
Acetic Acid		50 fluid ounces, or a sufficiency
Distilled Water		a sufficiency.

Crush the carbonate of ammonium ; add it gradually to about 45 ounces of the acetic acid ; then add more of the acid until a neutral liquid results ; lastly, add sufficient distilled water to yield three pints of product. The solution should be stored in bottles free from lead.

A little of the solution, heated in a test-tube to expel carbonic acid, should be neutral to test-papers. Specific gravity 1·073.

Concentrated liquors for preparing the ordinary Pharmacopœia solutions are made and supplied by wholesale druggists.

Used in the preparation of Liquor Ammonii Acetatis.

Dose—25 to 75 minims.

Liquor Ammonii Citratis.

Solution of Citrate of Ammonium.

Synonyms :—Liquor Ammoniæ Citratis ; Solution of Citrate of Ammonia.

Strong solution of Citrate of Ammonium	...	5 fluid ounces
Distilled Water sufficient to produce	...	20 fluid ounces.

The solution should be stored in bottles free from lead. Sp. gr. 1·062. This is considered to be a little too low.

Dose—2 to 6 fluid drachms.

Liquor Ammonii Citratis Fortior.

Strong Solution of Citrate of Ammonium.

Citric Acid	... ...	12 ounces
Strong Solution of Ammonia		11 fluid ounces, or a sufficiency
Distilled Water	... ...	a sufficiency.

Neutralise the acid with the ammonia, adding sufficient distilled water to yield 24 fluid ounces of product. The solution should be stored in bottles free from lead.

$$H_3C_6H_5O_7 + 3NH_4HO = (NH_4)_3C_6H_5O_7 + 3H_2O.$$

This solution deposits a fungoid growth on keeping.

It is neutral to test-paper. Sp. gr. 1·209.

According to Naylor this solution cannot be stored at common temperatures for more than 48 hours without a portion of the salt crystallising out.

Dose—$\frac{1}{2}$ to $1\frac{1}{2}$ fluid drachm.

Used in the preparation of Liquor Ammonii Citratis.

Liquor Antimonii Chloridi.

Solution of Chloride of Antimony.

Synonyms :—Butter of Antimony ; Muriate of Antimony.

Purified Black Antimony	...	1 pound
Hydrochloric Acid	... ...	4 pints.

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 draught, a little heat, which must be gradually augmented as the evolution of gas begins to slacken, until 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, returning what passes through first, that a perfectly clear solution may be obtained. Boil this down to the bulk of two pints, and preserve it in a stoppered bottle.

It is a heavy liquid usually of a yellowish-red colour. A little of it dropped into water gives a white precipitate, and the filtered solution lets fall a copious deposit on the addition of nitrate of silver. If the white precipitate formed by water be treated with sulphuretted hydrogen, it becomes orange coloured. The specific gravity of the solution is about 1·47. One fluid drachm of it mixed with a solution of a quarter of an ounce of tartaric acid in four fluid ounces of water, forms a clear solution, which, if treated with sulphuretted hydrogen, gives an orange precipitate, weighing, when washed and dried at 212° F., about 22 grains.

Used in the preparation of Antimonii Oxidum.

Liquor Arsenicalis.

Arsenical Solution.

Synonyms :—Liquor Potassæ Arsenitis; Fowler's Solution.

Arsenious Acid, in powder Carbonate of Potassium	of each 87 grains
Compound Tincture of Lavender	5 fluid drachms
Distilled Water	a sufficiency.

Place the arsenious acid and the carbonate of potassium in a flask with 10 ounces of the water, and apply heat until a clear solution is obtained. Allow this to cool. Then

add the compound tincture of lavender, and as much distilled water as will make the bulk 1 pint.

It is a reddish liquid, alkaline to test-paper, and having the odour of lavender. Specific gravity 1·010.

After being acidulated with hydrochloric acid it gives, with sulphuretted hydrogen, a yellow precipitate (*sulphide of arsenium*), which is brightest when the arsenical solution has been previously diluted. 442 grains by weight (1 fluid ounce) boiled for 5 minutes with 10 grains of bicarbonate of sodium, and when cold diluted with 6 fluid ounces of water, to which a little mucilage of starch has been added, does not give with the volumetric solution of iodine a permanent blue colour until 875 grain-measures have been added; corresponding to about 1 per cent. of arsenious acid, or to rather more than 4 grains ($4\frac{1}{3}$) in 1 fluid ounce.

In making this, no decomposition takes place, but if too much heat be applied, or a deficiency of water used, arsenite of potassium is formed.

By long keeping, the carbonate of potassium is slowly decomposed, arsenite of potassium being formed.

$$As_2O_3 + 3H_2O + K_2CO_3 = 2KH_2AsO_3 + H_2O + CO_2.$$

The principal use of the carbonate of potassium is to render the arsenious anhydride more soluble in the water.

The compound tincture of lavender is merely added to give colour and flavour.

Dose—2 to 8 minims.

Liquor Arsenici Hydrochloricus.

Hydrochloric Solution of Arsenic.

Arsenious Acid, in powder		87 grains
Hydrochloric Acid...	...	2 fluid drachms
Distilled Water ...	...	a sufficiency.

Boil the arsenious acid with the hydrochloric acid and 4 ounces of the water until it is dissolved, then add distilled water to make the bulk up to 1 pint.

It is a colourless liquid, having an acid reaction. Specific gravity 1·010.

Sulphuretted hydrogen gives at once a bright yellow precipitate (*sulphide of arsenium*). 442 grains by weight (1 fluid ounce) boiled for 5 minutes with 20 grains of bicarbonate of sodium and then diluted with 6 fluid ounces of distilled water to which a little mucilage of starch has been added, does not give with the volumetric solution of iodine a permanent blue colour until 875 grain-measures have been added; corresponding to 1 per cent. of arsenious acid, or to rather more than 4 grains ($4\frac{1}{3}$) in 1 fluid ounce.

There is no decomposition in making this preparation. Even if chloride of arsenium were formed, which is not probable, it would be decomposed by the water into arsenious acid and hyrochloric acid.

$$AsCl_3 + 3H_2O = H_3AsO_3 + 3HCl.$$

The hydrochloric acid is used to render the arsenious anhydride more soluble.

A similar preparation in the London Pharmacopœia, ($\frac{1}{3}$ the strength of the B.P.), is known under the name of "Dr De Valangin's Solution."

The strength of both arsenical solutions is estimated by the quantity of volumetric solution of iodine required to produce a permanent blue colour with mucilage of starch.

Dose – 2 to 8 minims.

Liquor Arsenii et Hydrargyri Iodidi.

Solution of Iodide of Arsenium and Mercury.

Synonym :—Donovan's Solution.

Iodide of Arsenium Red Iodide of Mercury	}	of each 45 grains
Distilled Water		a sufficiency.

Triturate the iodides with about an ounce and a half of distilled water until nearly all is dissolved. Pass through a filter, and wash the latter with sufficient water to produce 10 fluid ounces of solution.

It is a clear pale yellow liquid with a metallic flavour. Specific gravity 1·016.

Sulphuretted hydrogen throws down a precipitate partially insoluble in strong nitric acid (*sulphide of mercury*); while the dissolved part, when diluted, yields a yellow precipitate on the gradual addition of solution of sulphydrate of ammonium (*sulphide of arsenium*).

1 fluid ounce contains about $\frac{1}{100}$ of the molecular weight in grains (about 1 per cent. by weight) of iodide of arsenium, and of mercuric iodide.

The original Donovan's solution contained only about 42 grains of each iodide in 10 fluid ounces, and was therefore a weaker preparation.

Dose—10 to 30 minims.

Liquor Atropinæ Sulphatis.

Solution of Sulphate of Atropine.

Sulphate of Atropine	...	9 grains
Camphor Water ...	...	$16\frac{1}{2}$ fluid drachms.

This dissolves instantly and should be prepared when required. Solutions of atropine are very prone to change.

Used for dilating the pupil of the eye.

(*Strength* 1 *in* 100.)

Dose—1 to 4 minims.

Liquor Bismuthi et Ammonii Citratis.

Solution of Citrate of Bismuth and Ammonium.

Synonym :—Liquor Bismuthi.

Citrate of Bismuth	... ...	800 grains
Solution of Ammonia, Distilled Water	...	of each a sufficiency.

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. Dilute with distilled water to form 1 pint.

It is a colourless solution, with a slightly metallic taste. Specific gravity 1·07. Neutral or slightly alkaline to test-paper; is freely miscible with water; heated with alkalies it evolves ammonia, and yields a white precipitate. Evaporated to dryness and the residue ignited, a charred mass with a yellow edge results; this treated with nitric acid affords a solution which should stand the tests for impurities described under 'Purified Bismuth.' Two fluid drachms of the solution mixed with an ounce of distilled water, and treated with sulphuretted hydrogen in excess, yields a black precipitate, which, when washed and dried, weighs about 7 grains.

One fluid drachm contains an amount of bismuth equivalent to about 3 grains of oxide of bismuth.

On the addition of hydrochloric acid a white precipitate of oxychloride of bismuth (BiOCl) is thrown down, soluble in excess of acid.

This preparation is similar to Schacht's Solution of Bismuth.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Used in the preparation of Bismuthi et Ammonii Citras.

Liquor Calcii Chloridi.

Solution of Chloride of Calcium.

Chloride of Calcium	...	...	88 grains
Distilled Water	...	...	1 fluid ounce.

Dissolve, and filter if necessary.

Sp. gr. 1·145.

Dose—15 to 50 mimims.

Liquor Calcis.

Solution of Lime.

Synonyms:—Aqua Calcis; Lime Water.

Slaked Lime	...	...	...	2 ounces
Distilled Water	...	...	...	a sufficiency.

Wash the slaked lime with some of the water until a little of the filtered liquid, after being acidified with nitric acid, yields no turbidity with solution of nitrate of silver. Put the washed lime into a stoppered bottle containing one gallon of the water, and shake well for two or three minutes. After twelve hours the excess of lime will have subsided, and the clear solution may be drawn off with a siphon as it is required for use, or transferred to a green-glass bottle furnished with a well-ground stopper.

10 fluid ounces requires for neutralisation 180 grain-measures of the volumetric solution of oxalic acid, which corresponds to about 5 grains of lime, CaO. Acidified with nitric acid, nitrate of silver causes no precipitate (*absence of chlorides*).

The lime is washed with water to remove soluble chlorides and other alkalies more soluble than the calcic hydrate.

It often contains a little hydrate of sodium (NaHO)

caused by the decomposition of the silicate of sodium (*existing in common limestone*) with the lime.

There are 4 salts of calcium more soluble in cold water than in hot, viz., *hydrate, citrate, tartrate, and sulphate.*

On keeping, it absorbs carbonic acid gas from the air, and deposits carbonate of calcium on the sides of the bottle. It is ordered to be kept in *green glass* bottles, in consequence of its dissolving the oxide of lead contained in white glass.

Used in the preparation of Argenti Oxidum ; Linimentum Calcis ; Lotio Hydrargyri Flava ; Lotio Hydrargyri Nigra.

Dose—1 to 4 fluid ounces.

Liquor Calcis Chlorinatæ.

Solution of Chlorinated Lime.

Synonym :—Bleaching Liquid.

Chlorinated Lime	...	...	... 1 pound
Distilled Water	...	...	... 1 gallon.

Mix well the water and the chlorinated lime by trituration in a mortar, and having poured the mixture into a stoppered bottle, let it be well shaken several times for the space of three hours. Pour out now the contents of the bottle on a calico filter, and let the solution which passes through be preserved in a stoppered bottle.

Sp. gravity about 1·055. 80 grains by weight mixed with 20 grains of iodide of potassium dissolved in 4 fluid ounces of water, when acidulated with 2 fluid drachms of hydrochloric acid, gives a red solution which requires for the discharge of its colour not less than 450 grain-measures of the volumetric solution of hyposulphite of sodium, corresponding to about 2 per cent. of available chlorine. When the solution of chlorinated lime is made with the best

chlorinated lime, and is quite fresh, it may yield about 3 per cent. of available chlorine.

Liquor Calcis Saccharatus.

Saccharated Solution of Lime.

Slaked Lime	1 ounce
Refined Sugar, in powder	2 ounces
Distilled Water	1 pint.

Mix the lime and the sugar by trituration in a mortar. Transfer the mixture to a bottle containing the water, and having closed this with a cork shake it occasionally for a few hours. Finally separate the clear solution with a siphon, avoiding unnecessary exposure to the air, and keep it in a well-stoppered bottle.

The lime is not ordered to be washed in this case; as the solution is not used for the preparation of any of the official compounds, the presence of traces of chlorides is not detrimental.

Sp. gravity 1·052. 460·2 grains by weight (1 fluid ounce) requires for neutralisation 254 grain-measures of the volumetric solution of oxalic acid, which corresponds to 7·11 grains of lime, CaO, in one fluid ounce.

Unnecessary exposure to the air should be avoided, in order to prevent the colouration of the liquor.

The presence of the sugar renders the lime much more soluble, by forming a weak compound of lime and sugar, which is readily decomposed by carbonic acid gas.

Dose—15 to 60 minims.

Liquor Chlori.

Solution of Chlorine.

Synonym:—Chlorine Water.

Chlorine gas dissolved in water. The solution should be freshly prepared.

Hydrochloric Acid	6 fluid ounces
Black Oxide of Manganese, in fine powder	1 ounce
Distilled Water	34 fluid ounces.

Put the oxide of manganese into a gas-bottle, and having poured upon it the hydrochloric acid diluted with 2 ounces of the water, apply heat gently, and, by suitable tubes, cause the gas, as it is developed, to pass through 2 ounces of the water placed in an intermediate small phial, and thence to the bottom of a three-pint bottle containing the remainder of the water, the mouth of which is loosely plugged with tow. As soon as the chlorine ceases to be developed, let the bottle be disconnected from the apparatus in which the gas has been generated, corked loosely, and shaken until the chlorine is absorbed. Lastly, introduce the solution into a green-glass bottle furnished with a well-fitting stopper, and keep it in a cool and dark place.

It is a yellowish-green liquid, smelling strongly of chlorine, and immediately discharging the colour of a dilute solution of sulphate of indigo. Specific gravity 1·003. Evaporated it leaves no residue. When 20 grains of iodide of potassium dissolved in an ounce of distilled water is added to 439 grains by weight (1 fluid ounce) of this preparation, the mixed solution acquires a deep red colour, which requires for its discharge 750 grain-measures of the volumetric solution of hyposulphite of sodium, corresponding to 2·66 grains of chlorine.

Only a small quantity of water is used in the wash bottle,

in consequence of the solubility of chlorine gas in water. Its chief use is to absorb any undecomposed hydrochloric acid which may pass over from the flask.

It is decomposed by light first into hypochlorous and hydrochloric acids, and these, reacting, form hydrochloric acid and oxygen.

$$H_2O + Cl_2 = HClO + HCl, \text{ then}$$
$$2\ HClO + 2\ HCl = 4\ HCl + O_2.$$

No decomposition occurs when kept in the dark.
Dose—10 to 20 minims.

Liquor Cocainæ Hydrochloratis.

Solution of Hydrochlorate of Cocaine.

Hydrochlorate of Cocaine	33 grains ...	or ...	100 parts
Salicylic Acid ...	½ grain ...	,, ...	1½ parts
Distilled Water, sufficient to produce	6 fl. drachms	,, ...	1000 fluid parts.

Boil the water, add the salicylic acid, and then the hydrochlorate of cocaine; cool, and add water, if necessary to produce the required volume.

Dose—2 to 10 minims.

Liquor Epispasticus.

Blistering Liquid.

Synonym:—Linimentum Cantharidis.

Cantharides, in powder ...	5 ounces
Acetic Ether	a sufficiency.

Mix the cantharides with 3 fluid ounces of acetic ether; pack in a percolator, and at the expiration of twenty-four hours pour acetic ether over the contents of the percolator,

and allow the solution to pass slowly through until 20 fluid ounces are obtained. Keep the liquor in a stoppered bottle.

Used externally, and in the preparation of Collodium Vesicans.

Liquor Ferri Acetatis.

Solution of Acetate of Iron.

Synonyms :—Solution of Ferric Acetate ; Solution of Peracetate of Iron.

The same strength as Tincture of Acetate of Iron.

Strong Solution of Acetate of Iron	5 fluid ounces
Distilled Water, sufficient to produce, after admixture	20 fluid ounces.

Sp. gr. 1·031.

Dose—5 to 30 minims.

Liquor Ferri Acetatis Fortior.

Strong Solution of Acetate of Iron.

Solution of Persulphate of Iron	5 fluid ounces
Solution of Ammonia	a sufficiency
Glacial Acetic Acid, liquefied	3 fluid ounces
Distilled Water	a sufficiency.

Mix 8 fluid ounces of solution of ammonia with one pint of distilled water ; to this gradually add the solution of persulphate of iron previously diluted with about a pint of distilled water ; stir the whole thoroughly, taking care that ammonia is, even finally, in slight excess, as indicated by the odour of the mixture. Let the whole stand for two

hours, stirring occasionally; then put it on a calico filter, and, when the liquid has drained away, wash the precipitated ferric hydrate with distilled water until the liquid which passes through the filter ceases to give a precipitate with solution of chloride of barium. Let the ferric hydrate drain; squeeze it to remove superfluous moisture; dissolve it in the glacial acetic acid; and make the volume up to 10 fluid ounces with distilled water Allow any insoluble matter to subside, and pour off the clear solution.

It is a deep red fluid with a sour styptic taste and acetous odour, miscible with water or rectified spirit in all proportions. Diluted with water it yields a blue precipitate with ferrocyanide but not with ferricyanide of potassium. Specific gravity 1·127. A fluid drachm, diluted with 2 fluid ounces of water, gives with excess of ammonia a reddish-brown precipitate, which, when washed and ignited, weighs 5·7 grains.

It is four times stronger than the tincture

Used in the preparation of Liquor Ferri Acetatis and Tinctura Ferri Acetatis.

Dose—1 to 8 minims.

Liquor Ferri Dialysatus.

Solution of Dialysed Iron.

This solution of dialysed iron, so called, is a solution of highly basic ferric oxychloride, or chloroxide of iron, from which most of the acidulous matter has been removed by dialysis.

Strong Solution of Perchloride of Iron 7 fluid ounces
Solution of Ammonia } ... of each a sufficiency.
Distilled Water }

Mix 6 ounces of the solution of Perchloride of iron with 2 pints of distilled water, and stir into the mixture sufficient diluted solution of ammonia to impart, after thorough agitation, a distinct ammoniacal odour. Filter through calico, wash the precipitated ferric hydrate with distilled water, and then squeeze it to remove superfluous moisture. Add the precipitate to the remainder of the solution of perchloride of iron, stir thoroughly, warm gently, and when complete or nearly complete solution is obtained filter if necessary and place the liquid in a covered dialyser; then subject it to a stream of water in the usual manner until the solution on the dialyser is almost tasteless. The resulting solution should measure 28 fluid ounces.

It is a clear dark reddish-brown liquid, free from any marked ferruginous taste. Neutral to test-papers. Specific gravity about 1·047. The solution gives no precipitate with ferrocyanide of potassium (*absence of ferric chloride*) or with nitrate of silver (*absence of free chlorides*), but after being heated with hydrochloric acid it yields with ferrocyanide of potassium a blue precipitate.

100 grains by weight affords a precipitate with a solution of ammonia, which washed, dried, and ignited, weighs 5 grains.

Dose—10 to 30 mimims.

Liquor Ferri Perchloridi.

Solution of Perchloride of Iron.

Synonym:—Solution of Ferric Chloride.

The same strength as Tincture of Perchloride of Iron.

Prepared by mixing 5 fluid ounces of strong solution of perchloride of iron with sufficient distilled water to produce, after admixture, 20 fluid ounces.

Sp. gr. 1·11.

Dose—10 to 30 minims.

Liquor Ferri Perchloridi Fortior.

Strong Solution of Perchloride of Iron.

Iron Wire	...	...	4 ounces
Hydrochloric Acid	...	...	20½ fluid ounces
Nitric Acid	...	...	1½ fluid ounce
Distilled Water	...	...	a sufficiency.

Place the iron wire in a flask; add a mixture of 12½ fluid ounces of hydrochloric acid and 7 of water; expose the whole to a moderate temperature until effervescence ceases; heat to boiling; filter from undissolved iron, rinsing the flask and contents with a little water and pouring this over the filter; add to the filtrate 7 fluid ounces of hydrochloric acid; mix, and pour the solution in a slow continuous stream into a fluid ounce and a half of nitric acid, evolution of red fumes being promoted if necessary by a slight application of heat. Evaporate the product until no more nitrous fumes escape and a precipitate begins to form; then add 1 fluid ounce of hydrochloric acid and sufficient water to produce 17½ fluid ounces of the solution.

It is an orange-brown solution with a strong styptic taste, miscible with water and rectified spirit in all proportions. Diluted with water it is precipitated white by nitrate of silver, and blue by ferrocyanide of potassium, but not at all by ferricyanide of potassium (*absence of iron in the ferrous state*).

Specific gravity about 1·42. A fluid drachm of it diluted with 2 fluid ounces of water gives, upon the addition of an excess of solution of ammonia, a reddish-brown precipitate (*ferric hydrate*), which, when well washed and incinerated, weighs between 15 and 16 grains. A piece of copper

boiled for a few minutes in 50 or 100 grains of this solution, diluted with water, then rinsed in water, dried, and heated in a dry test-tube, yields no white crystalline sublimate (*absence of arsenic*). 2 ounces of iron are contained in 10 fluid ounces of the solution.

Several modifications have been introduced in connection with this preparation. The proportion of iron relatively to hydrochloric acid has been increased, so that there must always be a quantity of undissolved wire, the evident object being to obtain a saturated solution of ferrous chloride to begin with. The solution is to be poured into the nitric acid, which is a great improvement on the old process of adding the nitric acid and heating till the fumes were driven off, which had long ceased to be used in actual practice. The direction as to evaporating the liquid till a precipitate begins to form is very ambiguous, as there is difficulty in knowing when this takes place, owing to the dark colour of the liquid. The new process is some slight improvement on the old, but is still far from being entirely satisfactory.

The object contemplated in this liquor is to have an aqueous preparation of perchloride of iron for making the corresponding tincture.

The use of the nitric acid is to raise the iron from the ferrous to the ferric state.

This process is called oxidation; the black colour, which occurs in making this, is due to the action of the nitric oxide on the undecomposed ferrous salt. When the whole of the iron is converted into the ferric state the black colour disappears.

Its strength is estimated by the amount of ferric oxide obtained on adding excess of solution of ammonia to a given quantity of the solution, and incinerating the precipitated hydrate.

If sulphuretted hydrogen be passed through, or *nascent*

hydrogen be generated in this solution, the iron is reduced to ferrous chloride.

Used in the preparation of Liquor Ferri Dialysatus; Liquor Ferri Perchloridi; and Tinctura Ferri Perchloridi.

Liquor Ferri Pernitratis.

Solution of Pernitrate of Iron.

Fine Iron Wire, free from rust	...	...	1 ounce
Nitric Acid	...	...	$4\frac{1}{2}$ fluid ounces
Distilled Water	...	...	a sufficiency.

Dilute the nitric acid with 16 ounces of the water, introduce the iron wire into the mixture, and leave them in contact until the metal is dissolved, taking care to moderate the action, should it become too violent, by the addition of a little more distilled water. Filter the solution, and add to it as much distilled water as will make its bulk 1 pint and a half.

It is a clear solution of a reddish-brown colour, slightly acid, and astringent to the taste, and gives a blue precipitate with the ferrocyanide of potassium. When to a little of it placed in a test-tube half its volume of pure sulphuric acid is added, and then a solution of sulphate of iron is poured on, the whole assumes a dark-brown colour. Specific gravity 1·107. One fluid drachm treated with an excess of solution of ammonia gives a precipitate (*ferric hydrate*), which, when washed, dried, and incinerated, weighs 2·6 grains. It gives no precipitate with ferricyanide of potassium.

Dose—10 to 40 minims.

Liquor Ferri Persulphatis.

Solution of Persulphate of Iron.

Synonym:—Solution of Ferric Sulphate.

Sulphate of Iron	... ...	8 ounces
Sulphuric Acid Nitric Acid	... of each	6 fluid drachms
Distilled Water	... ...	12 fluid ounces or a sufficiency.

Add the sulphuric acid to 10 ounces of the water, and dissolve the sulphate of iron in the mixture with the aid of heat. Mix the nitric acid with the remaining 2 ounces of the water, and add to this diluted acid, warmed, the solution of sulphate of Iron. Concentrate by boiling, until, by the sudden disengagement of ruddy vapours, the liquid ceases to be black and acquires a red colour. A drop of the solution is now to be tested with ferricyanide of potassium, and if a blue precipitate forms, a few additional drops of nitric acid should be added, and the boiling renewed, in order that the whole of the sulphate may be converted into persulphate of iron. When the solution is cold, make the quantity 11 fluid ounces by the addition, if necessary, of distilled water.

It is a dense solution of a dark-red colour, inodorous and very astringent, miscible in all proportions with alcohol and water. Diluted with ten volumes of water, it gives a white precipitate with chloride of barium, and a blue precipitate with ferrocyanide, but not with ferricyanide of potassium (*absence of iron in the ferrous state*). Specific gravity 1·441. 1 fluid drachm diluted with 2 ounces of distilled water gives, upon the addition of an excess of solution of ammonia, a precipitate which, when well washed and incinerated, weighs 11·44 grains.

Used in the preparation of Ferri et Ammonii Citras;

Ferri et Quininæ Citras ; Ferri Peroxidum Hydratum ; Ferrum Tartaratum ; and Liquor Ferri Acetatis Fortior.

Liquor Gutta Percha.

Solution of Gutta Percha.

Gutta Percha, in thin slices	...		1 ounce
Chloroform	...	...	8 fluid ounces
Carbonate of Lead, in fine powder			1 ounce.

Add the gutta percha to 6 fluid ounces of the chloroform in a stoppered bottle, and shake them together frequently until solution has been effected. Then add the carbonate of lead previously mixed with the remainder of the chloroform, and having several times shaken the whole together, set the mixture aside, and let it remain at rest until the insoluble matter has subsided. Lastly, decant the clear liquid, and keep it in a well-stoppered bottle.

The carbonate of lead carries down minute impurities.

Used externally, and in the preparation of Charta Sinapis.

Liquor Hydrargyri Nitratis Acidus.

Acid Solution of Nitrate of Mercury.

Synonyms :—Acid Solution of Mercuric Nitrate ; Acid Solution of Pernitrate of Mercury.

Mercury	...	...	4 ounces
Nitric Acid ...	...	..	5 fluid ounces
Distilled Water	...	...	$1\frac{1}{2}$ fluid ounce.

Mix the nitric acid with the water in a flask, and dissolve the mercury in the mixture without the application of heat. Boil gently for 15 minutes, cool, and preserve

the solution, which should weigh about 12 ounces, in a stoppered bottle away from the light.

It is a colourless and strongly acid solution, which gives a yellow precipitate with solution of potash added in excess. If a crystal of sulphate of iron be dropped into it, in a little time the salt of iron, and the liquid in its vicinity, acquire a dark colour. Specific gravity about 2·0. Does not give any precipitate when a little of it is dropped into hydrochloric acid diluted with twice its volume of water (*absence of mercurous nitrate*).

Liquor Hydrargyri Perchloridi.

Solution of Perchloride of Mercury.

Synonyms :—Liquor Hydrargyri Bichloridi; Solution of Mercuric Chloride.

Prepared by dissolving 10 grains of perchloride of mercury and 10 grains of chloride of ammonium in 1 pint of distilled water.

The chloride of ammonium is added to render the solution more stable, by forming a double salt called Sal Alembroth.

On the addition of solution of potash a white precipitate is thrown down, having the composition NH_2HgCl,NH_4Cl, which was the old fusible white precipitate.

A simple solution of perchloride of mercury exposed to the air often deposits a film of mercurous chloride on the side of the bottle.

(*Strength* $\frac{1}{2}$ *grain in one fluid ounce.*)

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Liquor Iodi.

Solution of Iodine.

Iodine	22 grains	
Iodide of potassium ...	33 grains	
Distilled Water sufficient to produce	1 fluid ounce.	

Dissolve.

The iodide of potassium renders the iodine more soluble.

(*Strength* 5 *in* 100.)

Liquor Lithiæ Effervescens.

Effervescing Solution of Lithia.

Synonyms :—Aqua Lithiæ Effervescens ; Lithia Water.

Carbonate of Lithium	10 grains
Water	1 pint.

Mix in a suitable apparatus, and force into it as much pure washed carbonic acid gas, obtained by the action of sulphuric acid on chalk, as can be introduced with a pressure of about 4 atmospheres. Keep the solution in bottles securely closed, to prevent the escape of the compressed gas.

It effervesces strongly when the containing vessel is opened, carbonic acid gas escaping. The liquid is clear and sparkling, and has an agreeable acidulous taste. Half a pint of it, evaporated to dryness, yields 5 grains of a white solid residue, answering to the tests for carbonate of lithium.

Dose—5 to 10 fluid ounces.

Liquor Magnesii Carbonatis.

Solution of Carbonate of Magnesium.

Synonym:—Fluid Magnesia.

Sulphate of Magnesium	... ...	2 ounces
Carbonate of Sodium	... ...	$2\frac{1}{2}$ ounces
Distilled Water	... ...	a sufficiency.

Dissolve the two salts separately, each in half a pint of water. Heat the solution of sulphate of magnesium to the boiling point, then add to it the solution of carbonate of sodium, and boil them together until carbonic acid ceases to be evolved. Collect the precipitated carbonate of magnesium on a calico filter, and wash it with distilled water until what passes ceases to give a precipitate with chloride of barium. Mix the washed precipitate with a pint of distilled water, and, putting them into a suitable apparatus, force into it pure washed carbonic acid gas obtained by the action of sulphuric acid on chalk. Let the mixture remain in contact with excess of carbonic acid, retained there under pressure of about 3 atmospheres for 24 hours or longer, then filter the liquid to remove any undissolved carbonate of magnesium, and again pass carbonic acid gas into the filtered solution. Finally, keep the solution in a bottle securely closed, to prevent the escape of carbonic acid.

This solution contains nearly 10 grains of the official carbonate of magnesium in a fluid ounce, or about 2 per cent.

It effervesces slightly, or not at all, when the containing vessel is first opened. The liquid is clear and free from any bitter taste. A fluid ounce of it, evaporated to dryness, yields a white solid residue, which after being calcined weighs about 4 grains. This residue is insoluble in water and answers to the tests for magnesia.

When exposed to the air or kept for any length of time

the *normal carbonate of magnesium* with water of crystallisation is precipitated.

This solution resembles the well-known "Murray's Fluid Magnesia."

Dose—1 to 2 fluid ounces.

Liquor Magnesii Citratis.

Solution of Citrate of Magnesium.

Synonym :—Effervescing Solution of Citrates of Magnesium and Potassium.

Carbonate of Magnesium	100 grains
Citric Acid	200 grains
Syrup of Lemons	½ fluid ounce
Bicarbonate of Potassium, in crystals	40 grains
Water	a sufficiency.

Dissolve the citric acid in 2 ounces of the water, and having added the carbonate of magnesium, stir until it is dissolved. Filter the solution into a strong half-pint bottle, add the syrup and sufficient water to nearly fill the bottle, then introduce the bicarbonate of potassium, and immediately close the bottle with a cork which should be secured with string or wire. Afterwards shake the bottle until the bicarbonate of potassium has dissolved.

Dose—5 to 10 fluid ounces.

Liquor Morphinæ Acetatis.

Solution of Acetate of Morphine.

Acetate of Morphine	9 grains
Diluted Acetic Acid	18 minims
Rectified Spirit	½ fluid ounce
Distilled Water...	1½ fluid ounce.

Mix the acid, the spirit, and the water, and dissolve the acetate of morphine in the mixture.

(*The strength is about* 1 *in* 100.)

The acetate of morphine employed should be recently prepared, and of such quality that 20 grains will form a clear solution with 1 fluid drachm of water by the help of not more than 1 grain of acetic acid.

Solution of acetate of morphine may also be prepared by diluting 90 minims of Injectio Morphinæ Hypodermica with sufficient of a mixture of 1 volume of rectified spirit and 2 volumes of water to form 2 fluid ounces of the solution.

The acetic acid is used to render the acetate of morphine soluble; the spirit is used as a preservative.

It does not keep well, owing to the formation of a fungoid growth, when the acetic acid is decomposed and morphine is deposited.

Dose—10 to 60 minims.

Liquor Morphinæ Bimeconatis.

Solution of Bimeconate of Morphine.

Hydrochlorate of Morphine		9 grains
Solution of Ammonia	...	a sufficiency
Meconic Acid	... ...	6 grains
Rectified Spirit	... ...	½ fluid ounce
Distilled Water	... ...	a sufficiency.

Dissolve the hydrochlorate of morphine in 2 or 3 drachms of distilled water, aiding solution by warmth; then add 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 (*absence of chlorides*); drain; mix the precipitate with sufficient water to produce an ounce

and a half; add the rectified spirit and the meconic acid; dissolve.

It is a colourless or nearly colourless liquid. Solution of potash produces a white precipitate soluble in excess. Nitric acid gives an orange-red coloration, and neutral solution of perchloride of iron a blood-red coloration, which is not changed by the addition of diluted hydrochloric acid, but is discharged by the strong acid. 1 fluid ounce of this solution contains about $5\frac{1}{2}$ grains, equal to about $1\frac{1}{4}$ per cent. of bimeconate of morphine. The solution, as regards meconate of morphine, is about the same strength as tincture of opium.

Dose—5 to 40 minims.

Liquor Morphinæ Hydrochloratis.

Solution of Hydrochlorate of Morphine.

Hydrochlorate of Morphine	9 grains
Diluted Hydrochloric Acid	18 minims
Rectified Spirit	$\frac{1}{2}$ fluid ounce
Distilled Water	$1\frac{1}{2}$ fluid ounce.

Mix the hydrochloric acid, the spirit, and the water, and dissolve the hydrochlorate of morphine in the mixture.

(*The strength is about* 1 *in* 100.)

Dose—10 to 60 minims.

Liquor Morphinæ Sulphatis.

Solution of Sulphate of Morphine.

Sulphate of Morphine	35 grains
Rectified Spirit	2 fluid ounces
Distilled Water, sufficient to produce	8 fluid ounces.

Dissolve the sulphate of morphine in part of the water, add the rectified spirit and finally the remainder of the water.

Dose—10 to 60 minims.

Liquor Plumbi Subacetatis.

Solution of Subacetate of Lead.

Synonym:—Goulard's Extract.

Subacetate of Lead, $Pb_2O(C_2H_3O_2)_2$, dissolved in water.

Acetate of Lead ...	...	5 ounces
Oxide of Lead, in Powder		$3\frac{1}{2}$ ounces
Distilled Water ...	...	1 pint, or a sufficiency.

Boil the acetate of lead and the oxide of lead in the water for half an hour, constantly stirring; then filter, and when the liquid is cold add to it more distilled water, until the product measures 20 fluid ounces. Keep the clear solution in stoppered bottles.

When mixed with ordinary water a milkiness occurs, due to the hydrato-carbonic acid gas contained in the water precipitating carbonate of lead. When exposed to the air, carbonic acid gas is absorbed, and the same precipitate occurs.

It is a dense clear colourless liquid, with alkaline reaction and sweet astringent taste, becoming turbid by exposure to the air; and forming with mucilage of gum acacia an opaque white jelly. Sulphuric acid in excess gives a white precipitate, acetic acid being set free. Specific gravity 1·275. 284·5 grains by weight requires for perfect precipitation 500 grain measures of the volumetric solution of oxalic acid, corresponding to 24 per cent. of the subacetate of lead, $Pb_2O(C_2H_3O_2)_2$.

Used in the preparation of Liquor Plumbi Subacetatis Dilutus.

Liquor Plumbi Subacetatis Dilutus.

Diluted Solution of Subacetate of Lead.

Synonym :—Goulard's Water.

Solution of Subacetat of Lead ...	of each	2 fluid drachms
Rectified Spirit ...		
Distilled Water	...	$19\frac{1}{2}$ fluid ounces.

Mix, and filter through paper. Keep the clear solution in a stoppered bottle.

Liquor Potassæ.

Solution of Potash.

It may be prepared in the following manner:—

Carbonate of Potassium	1 pound
Slaked Lime, washed	12 ounces
Distilled Water	1 gallon.

Dissolve the carbonate of potassium in the water; and, having heated the solution to the boiling point in a clean iron vessel, gradually mix with it the washed slaked lime, obtained from about 13 ounces of slaked lime washed with distilled water until a little of the washings, acidified with nitric acid, gives no cloudiness with nitrate of silver (*absence of chlorides*), and continue the ebullition for 10 minutes with constant stirring. Then remove the vessel from the fire; and when by the subsidence of the insoluble matter the supernatant liquor has become perfectly clear, transfer it by means of a siphon to a green glass bottle furnished with an air-tight stopper, and add distilled water, if necessary, to make it correspond with the tests of specific gravity and neutralising power.

Sp. Gravity 1·058. 462·9 grains by weight (1 fluid ounce) requires for neutralisation 482 grain-measures of the volumetric solution of oxalic acid, corresponding to 5·84

per cent. by weight of hydrate of potassium, KHO. It does not effervesce when added to an excess of diluted hydrochloric acid (*absence of carbonates*). Mixed with an equal volume of distilled water, it gives no precipitate with solution of lime or oxalate of ammonium (*absence of lime and alumina*). When it is treated with an excess of diluted nitric acid, and evaporated to dryness, the residue forms with water a nearly clear solution, which may be slightly precipitated by chloride of barium and nitrate of silver, but is unaffected, or but very slightly affected, by ammonia. Acidulated by hydrochloric acid, the solution is unaffected by sulphuretted hydrogen (*absence of lead*). 1 fluid ounce contains 27 grains of hydrate of potassium.

If *more* water were used than is ordered in the Pharmacopœia, hydrate of lime would be in solution ; if *less* water, undecomposed carbonate of potassium would be in solution. Prepared according to the above process it contains alumina, which is extracted from the lime by the alkali. It may be prepared free from alumina by shaking together the slaked lime and carbonate of potassium in cold water.

Heat has no effect upon it.

It must not be filtered through animal substances, as it dissolves them, but through vegetable substances, such as cotton, tow, &c., on which it has no action. It filters best through asbestos.

The Pharmacopœia orders it to be kept in *green* glass bottles, in consequence of white glass containing lead, which would be attacked by the alkali.

Dose—15 to 60 minims.

Liquor Potassæ Effervescens.

Effervescing Solution of Potash.

Synonyms :—Aqua Potassæ Effervescens : Potash Water.

Bicarbonate of Potassium	30 grains
Water	1 pint.

Dissolve the bicarbonate of potassium in the water and filter the solution; then force into it as much pure washed carbonic acid gas, obtained by the action of sulphuric acid on chalk, as can be introduced with a pressure of about 4 atmospheres. Keep the solution in bottles securely closed, to prevent the escape of the compressed gas.

It effervesces strongly when the containing vessel is opened, carbonic acid gas escaping. The liquid is clear and sparkling, and has an agreeable acidulous taste. 10 fluid ounces, after being boiled for 5 minutes, requires for neutralisation 150 grain-measures of the volumetric solution of oxalic acid. 5 fluid ounces, evaporated to one-fifth, and 12 grains of tartaric acid added, yields a crystalline precipitate, which when dried weighs not less than 12 grains.

Liquor Potassii Permanganatis.

Solution of Permanganate of Potassium.

Permanganate of Potassium	...		88 grains
Distilled Water ...	...	...	1 pint.

Dissolve.

Dose—2 to 4 fluid drachms.

Liquor Sodæ.

Solution of Soda.

It may be prepared in the following manner:—

Carbonate of Sodium	...	...	28 ounces
Slaked Lime, washed	...	...	12 ounces
Distilled Water ...	...	...	1 gallon.

Dissolve the carbonate of sodium in the water; and, having heated the solution to the boiling point in a clean

iron vessel, gradually mix with it the washed slaked lime, obtained from about 13 ounces of slaked lime washed with distilled water until a little of the washings, acidified with nitric acid, gives no cloudiness with nitrate of silver (*absence of chlorides*) and continue the ebullition for ten minutes with constant stirring. Then remove the vessel from the fire; and when, by the subsidence of the insoluble matter, the supernatant liquor has become perfectly clear, transfer it, by means of a siphon, to a green-glass bottle furnished with an air-tight stopper, and add distilled water, if necessary, to make it correspond with the tests of specific gravity and neutralising power.

Specific Gravity 1·047. 458 grains by weight (1 fluid ounce) requires for neutralisation 470 grain-measures of the volumetric solution of oxalic acid, corresponding to 4·1 per cent. by weight of hydrate of sodium, NaHO. It does not effervesce when added to an excess of diluted hydrochloric acid. Mixed with an equal volume of distilled water, it gives no precipitate with solution of lime or oxalate of ammonium (*absence of lime and alumina*). When it is treated with an excess of diluted nitric acid and evaporated to dryness, the residue forms with water a clear solution which is only slightly precipitated by chloride of barium or by nitrate of silver, and not at all by ammonia. Acidified by hydrochloric acid, the solution is unaffected by sulphuretted hydrogen (*absence of lead*). 1 fluid ounce contains 18·8 grains of hydrate of sodium.

Liquor Sodæ Chlorinatæ.

Solution of Chlorinated Soda.

Chlorinated Lime	...	...	16 ounces
Carbonate of Sodium	...	...	24 ounces
Distilled Water ...	...	...	1 gallon.

Dissolve the carbonate of sodium in two pints of the

distilled water; thoroughly triturate the chlorinated lime with 6 pints of the water, and filter; well mix the solutions; again filter. Keep the solution in a stoppered bottle in a cool and dark place.

It is a colourless alkaline liquid, with astringent taste and feeble odour of chlorine. It decolorises sulphate of indigo. It is decomposed by hydrochloric acid, evolving chlorine and little or no carbonic acid gas. Specific gravity 1·054. 70 grains by weight, added to a solution of 20 grains of iodide of potassium in 4 fluid ounces of water and acidulated with 2 fluid drachms of hydrochloric acid, requires, for the discharge of the brown colour which the mixture assumes, at least 500 grain-measures of the volumetric solution of hyposulphite of sodium, corresponding to about $2\frac{1}{2}$ per cent. of available chlorine. The solution yields only a slight precipitate with oxalate of ammonium.

Used in the preparation of Cataplasma Sodæ Chlorinatæ.

Dose—10 to 20 minims.

Liquor Sodæ Effervescens.

Effervescing Solution of Soda.

Synonyms:—*Aqua Sodæ Effervescens*: *Soda Water.*

Bicarbonate of Sodium	...	...	...	30 grains
Water	...	...	...	1 pint.

Dissolve the bicarbonate of sodium in the water, and filter the solution; then force into it as much pure washed carbonic acid gas, obtained by the action of sulphuric acid on chalk, as can be introduced with a pressure of about 4 atmospheres. Keep the solution in bottles securely closed, to prevent the escape of the compressed gas.

It effervesces strongly when the containing vessel is opened, carbonic acid gas escaping. The liquid is clear and sparkling, and has an agreeable acidulous taste. 10

fluid ounces, after being boiled for 5 minutes, requires for neutralisation 178 grain-measures of the volumetric solution of oxalic acid.

Liquor Sodii Arseniatis.

Solution of Arseniate of Sodium.

Arseniate of Sodium, rendered anhydrous by a temperature not exceeding 300° F. ...	9 grains
Distilled Water	2 fluid ounces

Dissolve.

The arseniate of sodium is rendered anhydrous, in order to obtain a uniform strength, as the water of crystallisation varies in different samples. If heated above 300° F. pyro-arseniate of sodium would be formed. It is about the same strength as Liquor Arsenicalis.

(*Strength about* 1 *in* 100.)

Dose—5 to 10 minims.

Liquor Sodii Ethylatis.

Solution of Ethylate of Sodium.

Metallic Sodium, free from oxide	22 grains
Ethylic Alcohol...	1 fluid ounce.

Dissolve the sodium in the ethylic alcohol contained in a flask, the latter being kept cool in a stream of cold water. The solution should be recently prepared.

If it be long kept it absorbs carbonic anhydride from the air and forms carbonate of sodium.

It is a colourless liquid of syrupy consistence, becoming brown by keeping. Specific gravity 0·867. When heated it boils and gives off alcoholic vapours, leaving a white

salt which, on being strongly heated, chars. If the white salt be mixed with water and heated it yields alcohol, and the solution, on evaporation, leaves a white residue consisting almost wholly of caustic soda. Solution of ethylate of sodium contains 19 per cent. of the solid salt, NaC_2H_5O.

Liquor Strychninæ Hydrochloratis.

Solution of Hydrochlorate of Strychnine.

Synonym :—Liquor Strychninæ.

Strychnine, in crystals...	...		9 grains
Diluted Hydrochloric Acid	...		14 minims
Rectified Spirit...	...	...	$\frac{1}{2}$ fluid ounce
Distilled Water...	...	...	$1\frac{1}{2}$ fluid ounce.

Mix the hydrochloric acid with four drachms of the water, and dissolve the strychnine in the mixture by the aid of heat. Then add the spirit and the remainder of the water.

Hydrochlorate of strychnine is formed in this preparation; excess of hydrochloric acid is used to render the solution stable.

(*Strength about* 1 *in* 100.)

Dose—5 to 10 minims.

Liquor Trinitrinæ.

Solution of Trinitrin.

Synonyms :—Liquor Nitroglycerini ; Solution of Nitroglycerine ; Liquor Glonoini ; Solution of Glonoine.

Pure Nitroglycerine	...	...	1 part by weight
Rectified Spirit, sufficient to produce			100 fluid parts.

Dissolve. Specific gravity, 0·844.

Dose—$\frac{1}{2}$ to 2 minims.

Liquor Zinci Chloridi.

Solution of Chloride of Zinc.

Granulated Zinc ...	...	1 pound
Hydrochloric Acid...	...	44 fluid ounces
Solution of Chlorine	...	a sufficiency
Carbonate of Zinc...	...	$\frac{1}{2}$ ounce or a sufficiency
Distilled Water ...	...	1 pint.

Mix the hydrochloric acid and water in a porcelain dish, add the zinc, and apply heat gently to promote the action until gas is no longer evolved. Boil for half an hour, supplying the water lost by evaporation, and allow the product to cool.

Test a few drops of the resulting liquid for iron or lead by adding excess of ammonia and then sulphydrate of ammonium, when a black precipitate is produced if either be present. In the latter case, filter the remainder of the product into a bottle, and add solution of chlorine by degrees, with frequent agitation, until the fluid acquires a permanent odour of chlorine. Add the carbonate of zinc, in small quantities at a time, and with renewed agitation, until a brown sediment appears and the whole of the iron or lead is thus precipitated.

Filter the liquid into a porcelain basin, and evaporate until it is reduced to the bulk of 2 pints.

If no iron or lead be present, filter and evaporate to 2 pints at once.

It is a colourless fluid of astringent and sweetish taste. Specific gravity 1·460. It should respond to the tests described under "Zinci Chloridum."

This solution represents "Sir William Burnett's Disinfecting Fuid."

Used externally.

Lotiones.

Lotions.

There are 2 official lotions, both of which are intended for outward application.

Lotio Hydrargyri Flava.

Yellow Mercurial Lotion.

Synonym :—Yellow Wash.

Perchloride of Mercury	...	18 grains
Solution of Lime ...	...	10 fluid ounces.

Mix.

The precipitate which subsides on standing is the yellow mercuric oxide (Hg O).

$$HgCl_2 + Ca2HO = HgO + CaCl_2 + H_2O.$$

Lotio Hydrargyri Nigra.

Black Mercurial Lotion.

Synonym :—Black Wash.

Subchloride of Mercury	...	30 grains
Solution of Lime ...	...	10 fluid ounces.

Mix.

The precipitate which subsides in this case is black mercurous oxide (Hg_2O).

$$2HgCl + Ca_2HO = Hg_2O + CaCl_2 + H_2O.$$

Mel.

Honey.

A saccharine secretion deposited in the honeycomb by Apis mellifica.

When recently separated from the honeycomb, it is a viscid translucent liquid, of a light yellowish or brownish-yellow colour, which gradually becomes partially crystalline and opaque. It has a peculiar odour, and a very sweet characteristic taste. Boiled with water for 5 minutes and allowed to cool, it does not become blue with the solution of iodine. Incinerated it should not yield more than 0·2 per cent. of ash, the solution of which in water acidulated with nitric acid should not afford more than a slight turbidity with solution of chloride of barium.

Mel Boracis.

Borax Honey.

Borax, in fine powder	...	...	60 grains
Glycerine	...	...	30 grains
Clarified Honey	...	...	480 grains.

Mix.

The glycerine is used to ensure the perfect solution of the borax.

Mel Depuratum.

Clarified Honey.

Honey	...	...	5 pounds.

Melt the honey in a water-bath, and strain, while hot, through flannel, previously moistened with warm water.

Used in the preparation of Confectio Piperis; C. Scammonii; C. Terebinthinæ; Mel Boracis; Oxymel; and Oxymel Scillæ.

Menthol ($C_{10}H_{20}O$).

A stearoptene obtained by cooling the oil distilled from the fresh herb of Mentha arvensis, vars. piperascens et glabrata; and of Mentha piperita.

It occurs in colourless acicular crystals, usually more or less moist from adhering oil; or in fused crystalline masses. Its melting-point should not exceed 110° F. The hardest masses do not melt below 108° F. It has the odour and flavour of peppermint, producing warmth on the tongue, or, if air is inhaled, a sensation of coolness. It is sparingly soluble in water, and readily soluble in rectified spirit, the solutions having a neutral reaction. Boiled with sulphuric acid diluted with half its volume of water, menthol acquires an indigo-blue or ultramarine colour, the acid becoming brown. It should be entirely dissipated by the heat of a water-bath.

Dose—$\frac{1}{2}$ to 2 grains.

Mica Panis.

Crumb of Bread.

The softer parts of bread prepared from wheaten flour. It is principally employed as an excipient for pills, such as perchloride of mercury and silver nitrate, and it is also used as a convenient basis for emollient poultices.

Used in the preparation of Cataplasma Carbonis.

Misturæ.

Mixtures.

There are 11 official mixtures.

They are liquid preparations, and consist of different solids,

and fluids, suspended in water, milk, mucilage, syrup, &c.

Mistura Ammoniaci.

Ammoniacum Mixture.

Synonym:—Lac Ammoniacum.

Ammoniacum, in coarse powder	¼ ounce.
Distilled Water	8 fluid ounces.

Triturate the ammoniacum thoroughly with a little water into a thin paste; gradually add more water until the mixture assumes a uniform milky appearance; then strain through muslin.

It contains 13½ grains in 1 oz., or 1 in 32. When properly made it should have a milk-like appearance.

Dose—½ to 1 fluid ounce.

Mistura Amygdalæ.

Almond Mixture.

Synonym:—Almond Emulsion.

Compound Powder of Almonds	2 ounces
Distilled Water...	16 fluid ounces.

Rub the powder with a little of the water into a thin paste, then add the remainder of the water, and strain through muslin.

This mixture should be white. The emulsifying agent is the emulsin contained in the almonds. It is used as a vehicle for cough mixtures.

Dose—1 to 2 fluid ounces.

Mistura Creasoti.

Creasote Mixture.

Creasote...	15 minims
Glacial Acetic Acid	15 minims
Spirit of Juniper	½ fluid drachm
Syrup	1 fluid ounce
Distilled Water...	15 fluid ounces.

Mix the creasote with the acetic acid, gradually add the water, and lastly the syrup and spirit of juniper.

The glacial acetic acid is here used to promote the solubility of the creasote. The spirit of juniper masks the unpleasant taste of the creasote.

(*Strength about* 1 *minim of creasote in a fluid ounce.*)

It is soluble to the extent of 5 minims to the ounce.

Dose—1 to 2 fluid ounces.

Mistura Cretæ.

Chalk Mixture.

Prepared Chalk	¼ ounce
Gum Acacia, in powder	¼ ounce
Syrup	½ fluid ounce
Cinnamon Water...	7½ fluid ounces.

Triturate the chalk and gum acacia with the cinnamon water, then add the syrup, and mix.

This mixture does not keep very well; it undergoes fermentation. The powders are usually kept ready mixed, and the water added when required. In the absence of cinnamon water, two drops of oil of cinnamon may be used with each ounce of water. Precipitated chalk must not be used, as it is slightly crystalline and might produce irritation of the bowels.

Dose—1 to 2 fluid ounces.

Mistura Ferri Aromatica.

Aromatic Mixture of Iron.

Synonym :—Heberden's Ink.

Red Cinchona Bark, in powder ...	1 ounce
Calumba Root, in coarse powder ...	½ ounce
Cloves, bruised	¼ ounce
Fine Iron Wire	½ ounce
Compound Tincture of Cardamoms	3 fluid ounces
Tincture of Orange Peel	½ fluid ounce
Peppermint Water...	a sufficiency.

Macerate the cinchona bark, calumba root, cloves, and iron, with 12 fluid ounces of the peppermint water, in a closed vessel for three days, agitating occasionally; then filter the liquid, adding as much peppermint water to the filter as will make the product measure 12½ fluid ounces; to this add the tinctures, and preserve the mixture in a well-stoppered bottle.

Dose—1 to 2 fluid ounces.

Mistura Ferri Composita.

Compound Mixture of Iron.

Synonym :—Griffiths' Mixture.

Sulphate of Iron	25 grains
Carbonate of Potassium ...	30 grains
Myrrh, Refined Sugar ...	of each 60 grains
Spirit of Nutmeg	4 fluid drachms
Rose Water	9½ fluid ounces.

Reduce the myrrh to powder, add the carbonate of potassium and sugar, and triturate them with a small quantity of the rose water so as to form a thin paste; then gradually add more rose water and the spirit of nutmeg, continue the trituration and further addition of rose water until about 8 fluid ounces of a milky liquid is formed;

then add the sulphate of iron dissolved in the remainder of the rose water; mix thoroughly, and preserve the mixture as much as possible from contact with air.

The mixture is best made when required.

When freshly prepared it is of a green colour; if badly prepared, or by long keeping, it becomes of a brownish-red colour, according to the degree of oxidation. When the sulphate of iron is mixed with the carbonate of potassium, carbonate of iron is formed, which is held in suspension by a kind of soap formed by the action of the excess of carbonate of potassium on the myrrh.

$$FeSO_4 + K_2CO_3 = FeCO_3 + K_2SO_4.$$

The carbonate of iron formed being unstable, decomposes into oxide of iron and carbonic acid gas, the latter dissolving in the solution of excess of carbonate of potassium used, forming bicarbonate of potassium.

The object of adding the sugar is to prevent as much as possible this decomposition.

The sulphate of iron is ordered to be dissolved last, and in a separate portion of water, so as to prevent oxidation.

It is frequently kept in stock without the iron, which is added when required.

Dose—1 to 2 fluid ounces.

Mistura Guaiaci.

Guaiacum Mixture.

Guaiacum Resin Refined Sugar	of each...	$\frac{1}{2}$ ounce
Gum Acacia, powdered	... ...	$\frac{1}{4}$ ounce
Cinnamon Water ...	... ...	1 pint.

Triturate the guaiacum with the sugar and the gum, adding gradually the cinnamon water.

(*It contains about* 11 *grains in* 1 *oz.*)

Dose—$\frac{1}{2}$ to 2 fluid ounces.

Mistura Olei Ricini.

Castor Oil Mixture.

Castor Oil	6 fl. drachms
Oil of Lemon	10 minims
Oil of Clove...	2 minims
Syrup	1½ fl. drachm
Solution of Potash	1 fluid drachm
Orange Flower Water sufficient to produce ...	2 fluid ounces.

Mix the oils in a mortar, then incorporate one-third of the solution of potash, and afterwards the syrup, then an additional third of the solution of potash, then, gradually, half of the orange flower water, the remainder of the solution of potash, and, lastly, sufficient orange flower water to produce the required volume.

A better method than the above official one, is to put the syrup, solution of potash, and 1 fl. oz. of orange flower water into the bottle, and into this put the oils, previously mixed together in a measure, either all at once or in two or three portions, then fill up with water to make required volume.

Dose—½ to 2 fluid ounces.

Mistura Scammonii.

Scammony Mixture.

Scammony, in powder ...	6 grains
Milk	2 fluid ounces.

Triturate the scammony with the milk, until a uniform emulsion is obtained. The mixture should be made as required for use, as it soon becomes sour.

This should be made with virgin scammony, and not scammony resin.

(*It contains* 3 *grains in* 1 *oz., or* 1 *in* 240.)

Dose—1 to 3 fluid ounces.

Mistura Sennæ Composita.

Compound Mixture of Senna.

Synonyms :—Black Draught ; Mistura Cathartica.

Sulphate of Magnesium...	...	4 ounces
Liquid Extract of Liquorice	...	1 ounce
Tincture of Senna ...	...	$2\frac{1}{2}$ fluid ounces
Compound Tincture of Cardamoms	...	$1\frac{1}{2}$ fluid ounce
Infusion of Senna ...	...	15 fluid ounces.

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.

The tincture of senna is here used to increase the strength of the infusion and make it keep better.

(*It contains* 1 *oz. of sulphate of magnesium in* $5\frac{1}{2}$ *oz.*)

Dose—1 to $1\frac{1}{2}$ fluid ounce.

Mistura Spiritus Vini Gallici.

Mixture of French Brandy.

Synonym :—Brandy Mixture.

French Brandy Cinnamon Water	of each ...	4 fluid ounces
The Yolks of Two Eggs		
Refined Sugar	...	$\frac{1}{2}$ ounce.

Rub the yolks and sugar together, then add the cinnamon water and spirit.

(*It contains* 1 *of brandy in* $2\frac{1}{2}$.)

Dose—1 to 2 fluid ounces.

Mori Succus.

Mulberry Juice.

The juice of the ripe fruit of Morus nigra is of a dark violet or purple colour, with a faint odour, and a refreshing acidulous saccharine taste. Sp. gr. about 1·060.

Used in the preparation of Syrupus Mori.

Moschus.

Musk.

The dried secretion from the preputial follicles of Moschus moschiferus.

It occurs in irregular somewhat unctuous grains of a dark reddish-brown or reddish-black colour, a very strong peculiar diffusible penetrating persistent odour, and a bitterish taste; contained in a roundish or oval sac, from about $1\frac{1}{2}$ to 2 in. in diameter, which is nearly smooth on one side, and covered on the other or outer side by brownish-yellow or greyish adpressed bristle-like hairs, concentrically arranged around a nearly central orifice. It should be free from earthy impurities.

Dose—5 to 10 grains.

Mucilagines.

Mucilages.

There are 3 official mucilages, viz., Acacia, Starch, and Tragacanth.

Mucilago Acaciæ.

Mucilage of Gum Acacia.

Gum Acacia, in small pieces ...	4 ounces
Distilled Water	6 fluid ounces.

Put the gum and water into a covered earthen jar, and stir them frequently until the gum is dissolved. If necessary strain the solution through muslin.

Used in the preparation of all the Trochisci.

Mucilago Amyli.

Mucilage of Starch.

Synonyms :—Decoctum Amyli ; Starch Paste.

Starch	...	...	...	120 grains
Distilled Water	...	...	...	10 fluid ounces.

Triturate the starch with the water, gradually added, then boil for a few minutes, constantly stirring.

(*It contains* 1 *grain of Starch in* 40.)

Used in the preparation of all the enemas excepting Enema Asafœtidæ.

Mucilago Tragacanthæ.

Mucilage of Tragacanth.

Tragacanth, in powder			...	60 grains
Distilled water	...		...	10 fluid ounces
Rectified Spirit	...		...	2 fluid drachms.

Mix the tragacanth with the spirit; then pour in the water, with constant agitation.

There are no fluid grains in the Pharmacopœia, a fluid grain being the same as a grain-measure.

The rectified spirit is added to divide the tragacanth, so that the water may dissolve it readily.

This mucilage is principally used to suspend heavy powders.

Oleata.

Oleates.

Oleates are combinations of oleic acid with bases.

There are only 2 official, viz. :—Mercury and Zinc.

They are not pure oleates, as they contain a certain amount of oleic acid.

Oleates are generally kept in stock in the concentrated state, about 20 per cent., and diluted to 10 or 5 per cent. as required, by the addition of more oleic acid or vaseline.

It is found that weak oleates soon decompose.

Oleatum Hydrargyri.

Oleate of Mercury.

Yellow Oxide of Mercury	...	...	...	1 ounce
Oleic Acid	...	...	...	9 ounces.

To the oleic acid, kept stirred in a mortar, add gradually the oxide of mercury, and triturate occasionally until it is all dissolved.

It is a light-brown, oleaginous, semi-solid substance composed of oleate of mercury and oleic acid, and having the usual slight smell of oleic acid. Gently warmed, no black precipitate separates. Heated with a piece of copper foil, the latter becomes coated with a film of metallic mercury.

This oleate may be prepared with half the above proportion of oleic acid, the remainder being added just before, or not long before, the oleate is dispensed.

If long kept, metallic mercury separates and the oleate darkens in colour.

Oleatum Zinci.

Oleate of Zinc.

Oxide of Zinc	1 ounce
Oleic Acid	9 ounces.

Stir the oxide with the oleic acid, and allow the mixture to stand for two hours ; then heat on a water-bath until the oxide is dissolved.

Used in the preparation of Unguentum Zinci Oleati.

Oleo-Resina Cubebæ.

Oleo-Resin of Cubebs.

Cubebs, in coarse powder	2 pounds
Ether	4 pints, or a sufficiency.

Pack the cubebs closely in a percolator and pass the ether slowly through the mass until the liquor passes colourless. Let the ether evaporate from the liquor at first spontaneously and then over a water-bath, or recover it by distillation ; and transfer the residue to a closed vessel, letting it stand until waxy or crystalline matter ceases to be deposited. Decant the oleo-resin and preserve it in a well-stoppered bottle.

Dose—5 to 30 minims.

Olea.

Oils.

Natural oils are divided into two great classes.

1. Fatty or Fixed Oils.
2. Volatile or Essential Oils.

Fatty or Fixed Oils.

Most of these are glycerides, and are resolved by saponification into glycerine and certain fatty acids, chiefly stearic, palmitic, and oleic ; they cannot be distilled without decomposition, which distinguishes them from volatile oils, They are divided into drying and non-drying oils ; drying oils when exposed to the air absorb oxygen and are ultimately converted into a resinous mass, hence their use in the preparation of varnishes. Examples : Linseed, nut, hemp, and poppy oils. They contain an oleine different from that of the non-drying oils, and yield, by saponification, *not* oleic but linoleic acid. The non-drying oils are altered by exposure to the air but in a different manner, they turn rancid and acquire the power of reddening litmus. This alteration never takes place in the pure oils, but is due to the presence of foreign matters, such as the cellular substance of the plant or animal from which they have been extracted. These substances act as ferments which decompose a little of the fatty matter, yielding various volatile acids. Rancid oils may be restored to their original state by exhausting with boiling water, and treating, when cold, with a weak alkaline solution.

Fish oils are non-drying, the most important are sperm, seal, and cod liver oils.

Neats'-foot oil is obtained by boiling the feet of oxen after the hair and hoofs have been removed ; it is largely used for oiling clocks.

Fixed oils are insoluble in alcohol, with two exceptions, viz. : castor oil and oil of mustard.

Volatile Oils.

These consist either wholly of carbon and hydrogen, or of these elements together with oxygen, sulphur, or nitrogen. They are wholly volatile at high temperatures, and very

inflammable; most of them occur ready formed in plants; a small number in animal bodies. Examples: Oils of ants, castor, and ambergris; others are produced by dry distillation of organic bodies. These latter are called empyreumatic oils. Examples: Oils of amber and creasote. Others by fermentation. Some are produced by the action of sulphuric or phosphoric acid on organic bodies.

Those which exist ready formed in plants do not contain any other elements but carbon, hydrogen, and oxygen.

Sulphur is found only in certain oils, resulting from a kind of fermentation process, as the volatile oils of mustard, garlic, horseradish, and asafœtida.

When nitrogen occurs in an oil it must be regarded as an impurity, resulting from admixed vegetable tissue. Many essential oils, when exposed to cold, separate into a solid compound called a camphor or stearopten, and a liquid oil which for distinction is sometimes called an elœopten. Volatile oils are obtained by two processes, one by pressure. Examples: Oils of orange and lemon; the other by distillation with water, as without the water charring would result. Some of them, such as jasmine, narcissus, and mignonette, are so delicate that they have to be prepared in a special manner, viz.: by stratifying the flowers with layers of cotton or wool soaked with some fixed oil, which absorbs the perfume of the flowers; this is then digested in alcohol, which abstracts the essential oil, leaving the fixed oil.

The boiling point of most volatile oils is above that of water, hence it is usual to add common salt to the water to raise the temperature a few degrees, and ensure the oils passing over with the aqueous vapour.

The water which passes over contains a little of the volatile oil, and is used again to distil over a fresh quantity of the substance containing the oil; the oil collects either at the top or at the bottom of the water, and is separated by mechanical means.

Some volatile oils twist a ray of polarised light to the right, some to the left, and a few are inactive.

A column 10 inches long is used for determining the rotary power.

The blue or green colour of the oils of the Compositæ order is due to an oily compound called Cœrulein, which may be separated by distillation, passing over with the last portion of the oils.

Most of the oils ready formed have a composition $C_{10}H_{16}$. Examples: Turpentine, cubebs, lemon, and copaiba. Others contain oxidised compounds in addition. Example: Oil of wintergreen (methyl salicylic ether).

Fuming nitric acid added to a volatile oil causes it to ignite.

The quantity of oil in the medicinal waters may be estimated by adding a small quantity of mucilage of starch to half an ounce of the water, and adding an alcoholic solution of iodine until the oil ceases to give up hydrogen to the iodine, when the iodine begins to act upon the starch.

Most volatile oils are readily soluble in alcohol.

The following Oils are prepared by Distillation:—

Name	Source	Name	Source
Anethi	*Fruit*	Anisi	*Fruit*
Anthemidis	*Flowers*	Cajuputi	*Leaves*
Carui	*Fruit*	Caryophylli	*Flower buds*
Cinnamomi	*Bark*	Copaibæ	*Oleo-resin*
Coriandri	*Fruit*	Cubebæ	*Fruit*
Eucalypti	*Fresh leaves*	Lavandulæ	*Flower*
Juniperi	*Fruit*	Menthæ Piperitæ	*Fresh flwring. herb*
Menthæ Viridis	*Fresh flwrng. herb*	Pimentæ	*Fruit*
Myristicæ	*Seed*	Pini Sylvestris	*Fresh leaves*
Rutæ	*Fresh herb*	Rosmarini	*Flowering tops*
Santali	*Wood*	Sabinæ	*Fresh tops*
Sinapis	*Seed*	Terebinthinæ	*Oleo-resin*

By Expression.

Oleum	Amygdalæ	*From the seeds*
,,	Crotonis	,, *seeds*
,,	Lini	,, *seeds*
,,	Myristicæ Expressum ...	,, *seeds*
,,	Morrhuæ	,, *fresh liver of the cod, Gadus Morrhua*
,,	Olivæ	*From the fruit*
,,	Ricini	,, *seeds*
,,	Theobromatis	,, *seeds*

There are 4 volatile oils heavier than water, viz.: cassia, cinnamon, clove, and pimento.

Oleum Amygdalæ.

Almond Oil.

The oil expressed from the bitter or sweet almond.

It is a thin pale yellow liquid, nearly inodorous, with a bland oleaginous nutty taste.

Used in the preparation of Oleum Phosphoratum; Ung. Cetacei; Ung. Resinæ; and Ung. Simplex.

Oleum Anethi.

Oil of Dill.

The oil distilled in Britain from dill fruit.

It is a pale yellow liquid, with a pungent odour, and a hot sweetish taste.

Dose—1 to 4 minims.

Oleum Anisi.

Oil of Anise.

The oil distilled in Europe from anise fruit; or in China from star-anise fruit.

It is a colourless or very pale yellow liquid, with the odour of the fruit and an aromatic sweetish taste. The ordinary oil of anise congeals at a temperature between 50° and 60° F., and may remain solid at 62° or 63° F.; oil of star-anise only becomes solid at a few degrees above the freezing point of water.

It contains about 25 per cent. of stearopten, and 75 per cent. of elœopten. It is sometimes adulterated with spermaceti and camphor: the former may be detected by its being insoluble in cold alcohol, the latter by its odour on heating.

Used in the preparation of Essentia Anisi; Tinct. Camphoræ Co.; and Tinct. Opii Ammoniata.

Dose—1 to 4 minims.

Oleum Anthemidis.

Oil of Chamomile.

The oil distilled in Britain from chamomile flowers.

It is of a pale blue or greenish-blue colour, but gradually becoming yellowish-brown; with the peculiar aromatic taste and odour of the flowers.

Used in the preparation of Ext. Anthemidis.

Dose—1 to 4 minims.

Oleum Cadinum.

Oil of Cade.

Synonyms:—"*Huile de Cade*"; *Juniper Tar Oil.*

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of Juniperus Oxycedrus, *Linn.*, and some other species.

Characters.—A dark reddish-brown or nearly black more or less viscid oily liquid, with a not unpleasant empyreumatic odour and an aromatic bitter and acrid taste. Specific gravity about 0·990. It is soluble in ether and chloroform; partly soluble in cold, almost wholly in hot rectified spirit. In water it is very slightly soluble. The filtered aqueous solution is almost colourless and possesses an acid reaction.

Oleum Cajuputi.

Oil of Cajuput.

The oil distilled from the leaves of Melaleuca minor.

It is a transparent limpid very volatile pale bluish-green liquid, with a strong penetrating agreeable camphoraceous odour, and a warm bitterish aromatic camphoraceous taste, succeeded by a sensation of coldness in the mouth.

Used in the preparation of Lin. Crotonis and Sp. Cajuputi.

Dose—1 to 4 minims.

Oleum Carui.

Oil of Caraway.

The oil distilled in Britain from caraway fruit.

It is a colourless or pale yellow liquid when freshly prepared, but gradually becoming darker; it has the odour of the fruit, and a spicy somewhat acrid taste.

Used in the preparation of Conf. Scammonii, and Pil. Aloes Barb.

Dose—1 to 4 minims.

Oleum Caryophylli.

Oil of Cloves.

The oil distilled in Britain from cloves.

A colourless or pale yellow liquid when freshly prepared, but gradually becoming reddish-brown ; having in a high degree the odour and taste of cloves.

It is one of the 4 oils heavier than water.

Used in the preparation of Conf. Scammonii ; Pil. Coloc. Co. ; and Pil. Coloc. Co. et Hyoscyami.

Dose—1 to 4 minims.

Oleum Cinnamomi.

Oil of Cinnamon.

The oil distilled from cinnamon bark.

It is a yellowish liquid when freshly prepared, but gradually becoming cherry-red ; having the odour and taste of cinnamon bark. It sinks in water.

Used in the preparation of Spiritus Cinnamomi.

Dose—1 to 4 minims.

Oleum Copaibæ.

Oil of Copaiva.

The oil distilled from copaiva.

A colourless or pale yellow liquid, with the odour and taste of copaiva.

Dose—5 to 20 minims.

Oleum Coriandri.

Oil of Coriander.

The oil distilled in Britain from coriander fruit.

It is a pale yellow or colourless liquid, having the odour of the fruit and a mild aromatic taste.

Used in the preparation of Syrupus Sennæ.

Dose—1 to 4 minims.

Oleum Crotonis.

Croton Oil.

The oil expressed in Britain from the seeds of Croton Tiglium.

A brownish-yellow to dark reddish-brown liquid, fluorescent, with a viscid consistence which is increased by age, a faint, peculiar, somewhat rancid, disagreeable odour, and an oily acrid taste. Entirely soluble in alcohol.

It contains crotonic acid, which turns blue litmus paper red.

Used in the preparation of Lin. Crotonis.

Dose—$\frac{1}{3}$ to 1 minim.

Oleum Cubebæ.

Oil of Cubebs.

The oil distilled in Britain from cubebs.

A colourless or greenish-yellow liquid, with the odour and taste of cubebs.

Dose—5 to 20 minims.

Oleum Eucalypti.

Oil of Eucalyptus.

The oil distilled from the fresh leaves of Eucalyptus globulus, and probably other species of Eucalyptus.

Eucalyptus oil is colourless, or of a pale straw-colour, becoming darker and thicker by exposure. It has an aromatic odour, and a spicy and pungent flavour, leaving a sensation of coldness in the mouth. It is neutral to litmus paper.

Used in the preparation of Ung. Eucalypti.

Dose—1 to 4 minims.

Oleum Juniperi.

Oil of Juniper.

The oil distilled in Britain from the full-grown unripe green fruit of Juniperus communis.

It is colourless or pale greenish-yellow, with the characteristic odour of the fruit and a warm aromatic taste.

Used in the preparation of Spiritus Juniperi.

Dose—1 to 4 minims.

Oleum Lavandulæ.

Oil of Lavender.

The oil distilled in Britain from the flowers of the Lavandula vera.

It is a pale yellow or nearly colourless liquid, with the very fragrant odour of the flowers, and a hot bitter aromatic taste.

The lighter the oil the better the quality; the foreign oil is far inferior to the English.

Used in the preparation of Lin. Camph. Co.; Sp. Lavandulæ; and Tinct. Lavandulæ Co.

Dose—1 to 4 minims.

Oleum Limonis.

Oil of Lemon.

A volatile oil obtained by mechanical means from fresh lemon peel.

It is a pale yellow liquid, with a very fragrant odour, and a warm bitterish aromatic taste.

Used in the preparation of Lin. Potassii Iodidi cum Sapone, and Sp. Ammoniæ Aromaticus.

Dose—1 to 4 minims.

Oleum Lini.

Linseed Oil.

The oil expressed in Britain, without heat, from linseed.

It is a viscid yellow liquid, with a faint odour, and bland oleaginous taste. It gradually thickens by exposure to the air.

Oleum Menthæ Piperitæ.

Oil of Peppermint.

The oil distilled in Britain from fresh flowering peppermint, Mentha piperita.

It is a colourless, pale yellow, or greenish-yellow liquid when freshly prepared, but becoming gradually thicker and reddish by age; with the odour of peppermint, and a strong

penetrating aromatic taste, followed by a sensation of coldness in the mouth.

It is often adulterated with foreign oil of rosemary and turpentine. The herb yields double the quantity of oil in a warm dry season than in a cold wet one.

Used in the preparation of Aq. Menthæ Pip.; Ess. Menthæ Pip.; Pil. Rhei Co.; Sp. Menthæ Pip.; Tinct. Chloroformi et Morphinæ.

Dose—1 to 4 minims.

Oleum Menthæ Viridis.

Oil of Spearmint.

The oil distilled in Britain from fresh flowering spearmint, Mentha viridis.

It is a colourless, pale yellow, or greenish-yellow liquid when freshly prepared, but becoming reddish by age; with the odour and taste of the herb.

Used in the preparation of Aq. Menthæ Viridis.

Dose—1 to 4 minims.

Oleum Morrhuæ.

Cod Liver Oil.

The oil extracted from the fresh liver of the cod, Gadus Morrhua, by the application of a heat not exceeding 180° F.

It is a pale yellow liquid, with a slight fishy odour and bland fishy taste. A drop of sulphuric acid, added to a few drops of the oil on a porcelain slab, develops a violet colour, which soon passes to a yellowish or brownish red.

Dose—1 to 8 fluid drachms.

Oleum Myristicæ.

Volatile Oil of Nutmeg.

The oil distilled in Britain from nutmeg.

A colourless or straw-yellow liquid, having the odour and taste of nutmeg.

Used in the preparation of Pil. Aloes Soc.; Sp. Ammoniæ Aromaticus; and Sp. Myristicæ.

Dose—1 to 4 minims.

Oleum Myristicæ Expressum.

Expressed Oil of Nutmeg.

Synonyms :—Myristicæ Adeps; Oil of Mace.

A concrete oil obtained by means of expression and heat from nutmeg.

It is of an orange-brown or orange-yellow colour, more or less mottled, firm consistence, and fragrant odour like that of nutmeg.

Used in the preparation of Emp. Calefaciens and Emp. Picis.

Oleum Olivæ.

Olive Oil.

The oil expressed from the ripe fruit of Olea Europæa.

It is of a pale yellow or greenish-yellow colour, with a very faint agreeable odour, and a bland oleaginous taste; congeals partially at about 36° F.

Used in the preparation of Charta Epispastica; Emp. Ammoniaci cum Hyd.; Emp. Hyd.; Emp. Picis; Emp. Plumbi; Emp. Saponis Fuscum; Enema Mag. Sulph.; Lin. Ammoniæ; Lin. Calcis; Lin. Camph.; Ung. Cantharidis; Ung. Hyd. Co; Ung. Hyd. Nit.; Ung. Veratrinæ.

Oleum Phosphoratum.

Phosphorated Oil.

Prepared by heating oil of almonds in a porcelain dish to about 300° F. and keeping it at that temperature for about 15 minutes, then letting it cool, and filtering it through paper. Putting 4 fluid ounces of this oil into a stoppered bottle, capable of holding 4½ fluid ounces, and adding to it 16 grains of pure dry phosphorus. Immersing the bottle in hot water until the oil has acquired the temperature of 180° F., removing the stopper two or three times to allow the escape of expanded air, then shaking the oil and phosphorus together until the latter is entirely dissolved.

It is a clear straw-cloured oil; phosphorescent in the dark.

The strength of this preparation is about 1 per cent. of phosphorus.

This oil is more easily prepared by dissolving the phosphorus in a little ether, then adding the solution to the oil, and digesting in warm water to expel the ether.

Dose—5 to 10 minims.

Oleum Pimentæ.

Oil of Pimento.

The oil distilled in Britain from pimento.

It is a colourless or slightly yellowish-red liquid when freshly prepared, but becoming brown by age; having the odour and taste of pimento. It sinks in water.

The addition of a few drops of this oil prevents fats and ointments becoming rancid.

Dose—1 to 4 minims.

Oleum Pini Sylvestris.

Fir-wool Oil.

The oil distilled from the fresh leaves of Pinus sylvestris.

This oil has long been before the public as a proprietary article. Russian oil of turpentine (from the oleo-resin of *Pinus sylvestris*) closely resembles fir-wool oil in odour, but it is lighter (sp. gr. ·868). The turpentine oil is also less soluble in rectified spirit.

It is colourless, or nearly so, with an aromatic lavender-like odour and a pungent but not unpleasant flavour.

Sp. gr. not below ·870. Soluble in about seven times its volume of rectified spirit.

Used in the preparation of Vapor Olei Pini Sylvestris.

Oleum Ricini.

Castor Oil.

The oil expressed from the seeds of Ricinus communis.

It is bleached by exposure to light on the tops of houses. It is composed of three fatty acids, viz.—ricinic, ricino-margaritic, and ricino-stearic acid, each in combination with glycerine. Sometimes adulterated with croton oil.

It should be entirely soluble in 1 volume of absolute alcohol, or in 2 of rectified spirit.

Dose—1 to 8 fluid drachms.

Oleum Rosmarini.

Oil of Rosemary.

The oil distilled from the flowering tops of Rosmarinus officinalis.

It is a colourless or pale yellow liquid, with the odour of rosemary and a warm aromatic taste.

Used in the preparation of Lin. Saponis; Sp. Rosmarini; and Tinct. Lavandulæ Co.

Dose—1 to 4 minims.

Oleum Rutæ.

Oil of Rue.

The oil distilled from the fresh herb of Ruta graveolens. It is a pale yellow oil when freshly prepared, with a strong disagreeable odour and a bitter acrid taste.

Dose—1 to 4 minims.

Oleum Sabinæ.

Oil of Savin.

The oil distilled in Britain from the fresh tops of Juniperus Sabina.

A colourless or pale yellow oil, with the odour of the plant and a bitterish acrid taste.

Dose—1 to 4 minims.

Oleum Santali.

Oil of Sandal Wood.

Synonym :—Oleum Santali Flavi.

The oil distilled from the wood of Santalum album.

It is thick in consistence, pale yellow in colour, has a strongly aromatic odour, a pungent and spicy flavour, and is neutral or slightly acid in reaction.

Sp. gr. about ·96. It is readily soluble in alcohol.

Dose—10 to 30 minims.

Oleum Sinapis.

Oil of Mustard.

The oil distilled with water from black mustard seeds after the expression of the fixed oil.

It is colourless or pale yellow.

Sp. gr. 1·015 to 1·020. It is insoluble in alcohol.

Artificial oil of mustard is sulphocyanate of allyl, and is prepared by distilling a mixture of glycerine and biniodide of phosphorus, by which means iodide of allyl is obtained; this is then digested with sulphocyanate of potassium.

Used in the preparation of Lin. Sinapis Co.

Oleum Terebinthinæ.

Oil of Turpentine.

The oil distilled, usually by aid of steam, from the oleo-resin obtained from Pinus australis, Pinus palustris, Pinus Tæda, sometimes from Pinus Pinaster and Pinus sylvestris.

It is rectified by mixing with an alkali to saturate resinous acids, and re-distilling.

It is a limpid, colourless liquid, with a strong peculiar odour. It commences to boil at about 320° F., leaving little or no residue.

Used in the preparation of Conf. Terebinthinæ; Enema Terebinthinæ; Lin. Terebinthinæ; Lin. Terebinthinæ Aceticum; and Ung. Terebinthinæ.

Dose—10 minims to 4 fluid drachms.

Oleum Theobromatis.

Oil of Theobroma.

Synonym:—Cacao Butter.

A concrete oil obtained by expression and heat from the ground seeds of Theobroma Cacao.

It is of the consistency of tallow, yellowish in colour, and has an odour resembling that of chocolate; bland and

agreeable in taste, clean in fracture, and should present no appearance of foreign matter. It usually melts at a temperature between 86° and 95° F.

The heat used in the extraction of this oil is to melt the concrete oil; if not previously melted it could not be expressed from the seeds.

It is used in the preparation of the suppositories, and has the advantage over other oils in not becoming rancid on exposure to the air.

Ovi Albumen.

Egg Albumen.

The liquid white of the egg of Gallus Bankiva, var. Domesticus.

It contains about 12 per cent. of albumen; the yolk contains 3 per cent.

Albumen is a nitrogenous substance, found to a large extent in the white of egg, and to a smaller extent in the yolk of the egg. Albumen, which at ordinary temperatures is a clear fluid, when heated forms an opaque solid known as coagulated albumen. This coagulated albumen is of the same composition as ordinary albumen, but is an isomeric modification of it; the change in properties being due to the atoms being differently arranged in the molecule.

Albumen is useful as an antidote in cases of poisoning by many metallic salts, such as corrosive sublimate, sulphate of copper, and sugar of lead, as it forms an insoluble compound with these salts.

Ovi Vitellus.

Yolk of Egg.

The yolk of the egg of Gallus Bankiva, var. Domesticus.

Used in the preparation of Mistura Spiritus Vini Gallici.

Oxymel.

Oxymel.

Clarified Honey	40 ounces
Acetic Acid	5 fluid ounces
Distilled Water	5 fluid ounces.

Liquefy the honey by heat, and mix with it the acetic acid and water.

Dose—1 to 2 fluid drachms.

Oxymel Scillæ.

Oxymel of Squill.

Vinegar of Squill	1 pint
Clarified Honey	2 lbs.

Mix and evaporate by a water-bath until the product when cold shall have a sp. gr. of 1·32.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Paraffinum Durum.

Hard Paraffin.

Synonyms :—Paraffin ; Paraffin Wax ; Solid Paraffin.

A mixture of several of the harder members of the paraffin series of hydrocarbons ; usually obtained by distillation from shale, separation of the liquid oils by refrigeration, and purification of the solid product.

Sp. gr. ·82 to ·94. Insoluble in water; freely soluble in ether and chloroform. Melts at 110° to 145° F.

A paraffin with a melting-point of 126° commands only half the price of one melting at 142°.

A paraffin melting at 142° will necessarily make a much harder ointment than one melting at 110°.

From these reasons it would seem unwise to have allowed so great a variation in the melting-point (110° to 145°). It may also be noted that 142° is the highest to be met with in trade.—*Umney.*

Paraffinum Molle.

Soft Paraffin.

Synonyms :—Petrolatum ; Pétroléine ; Unguentum Paraffinum ; Petroleum Jelly.

A semi-solid mixture containing some of the softer or more fluid members of the paraffin series of hydrocarbons ; usually obtained by purifying the less volatile portions of petroleum.

Sp. gr. ·840 to ·870. Insoluble in water ; freely soluble in ether and chloroform. Melts at 95° to 105° F.

This is liable to contain foreign compounds, which cause it to emit a disagreeable odour when burned. Under the name of "vaseline" soft paraffin has come largely, and apparently deservedly, into use.

Both "paraffins" form excellent bases for ointments. They have the great advantage of not being liable to turn rancid.

Paraldehydum.

Paraldehyde.

$C_6H_{12}O_3$.

A product of the polymerization of aldehyde by various acids or salts.

Characters and Tests.—A clear colourless liquid having a characteristic ethereal odour and a burning and afterwards a cooling taste. Sp. gr. 0·998. Boiling-point 255°·2 F. It begins to congeal to a clear crystalline mass at 50° F. One part dissolves in ten parts of water at 60° F.; it is less soluble in hot water. It is miscible, in all proportions, with rectified spirit or with ether. An aqueous solution should have a neutral reaction. It affords no coloration on standing for two hours mixed with a solution of potash or soda, nor any precipitate with a solution of either chloride of barium or nitrate of silver.

Dose—$\frac{1}{2}$ to $1\frac{1}{2}$ fluid drachms.

Pepsin.

Pepsin.

A preparation of the mucous lining of the fresh and healthy stomach of the pig, sheep, or calf. It may be prepared as follows:—

The stomach of one of these animals recently killed having been cut open and laid on a board with the inner surface upwards, any adhering portions of food, dirt, or other impurity, are to be removed and the exposed surface slightly and rapidly washed with a little cold water; the cleansed mucous membrane is then to be scraped with a blunt knife or other suitable instrument, with some pressure, and the viscid pulp thus obtained is to be immediately spread over the surface of glass or glazed earthenware and quickly dried at a temperature not exceeding 100° F. The dried residue is to be reduced to powder and preserved in a stoppered bottle.

It is a light yellowish-brown powder, having a faint but not disagreeable odour, and a slightly saline taste, without any indication of putrescence. Very slightly soluble in water or spirit. 2 grains of it with an ounce of distilled water, to which 5 minims of hydrochloric acid have been added, form a mixture in which at least 100 grains of hard-boiled white of egg, passed through wire gauze of 36 meshes per linear inch, and made of No. 32 brass or copper wire, will dissolve on their being well mixed, digested, and well stirred together for 30 minutes at a temperature of 130° F.

Dose—2 to 5 grains.

Pilulæ.

Pills.

Pills are the most convenient of all forms for administering medicines, both from their portability, and also that by this means offensive substances may be taken with but slight inconvenience. The size is usually limited from 4 to 6 grains.

There are 22 official pills.

Before silvering asafœtida pills they should be varnished

in order to prevent the sulphur in the asafœtida acting on the silver.

Soap must not be used as an excipient when salts of iron are present, or decomposition will take place, due to the action of the alkali in the soap.

Confection of roses is useful as an excipient because it keeps the mass soft.

The proportions of the active ingredients are given in parenthesis after each pill.

Pilula Aloes Barbadensis.

Pill of Barbadoes Aloes.

Barbadoes Aloes, in powder	...		2 ounces
Hard Soap, in powder	...	...	1 ounce
Oil of Caraway	...	...	1 fluid drachm
Confection of Roses	...	...	1 ounce.

Beat all together until thoroughly mixed.

It has a strong smell of caraway.

Dose—5 to 10 grains.

(*Aloes* 1 *in* 2.)

Pilula Aloes et Asafœtidæ.

Pill of Aloes and Asafœtida.

Socotrine Aloes, in powder		...	1 ounce
Asafœtida	... ...	...	1 ounce
Hard Soap, in powder	...	...	1 ounce
Confection of Roses	...	...	about 1 ounce, or a sufficiency.

Beat all together until thoroughly mixed.

It has a very powerful fetid odour, and is of a brown colour.

Dose—5 to 10 grains.

(*Aloes* 1, *Asafœtida* 1 *in* 4.)

Pilula Aloes et Ferri.

Pill of Aloes and Iron.

Sulphate of Iron	...	...	1½ ounce
Barbadoes Aloes, in powder		...	2 ounces
Compound Powder of Cinnamon			3 ounces
Confection of Roses	...	...	4 ounces.

Reduce the sulphate of iron to powder, rub it with the aloes and compound powder of cinnamon, and, adding the confection, make the whole into a uniform mass.

This should be of a greenish-brown colour.

Dose—5 to 10 grains.

(*Aloes* 1, *Iron* ¾ *in* 5¼.)

Pilula Aloes et Myrrhæ.

Pill of Aloes and Myrrh.

Synonym :—Pil. Rufi.

Socotrine Aloes	...	...	...	2 ounces
Myrrh	...	...	...	1 ounce
Saffron, dried	...	...	...	½ ounce
Treacle	...	...	...	1 ounce
Glycerine	...	...	...	a sufficiency.

Triturate the aloes, myrrh, and saffron together; then add the treacle and sufficient glycerine, and beat them together into a uniform mass.

It is of a reddish-brown colour.

It was formerly made up with confection of roses. Glycerine and treacle are found to keep the mass softer.

Dose—5 to 10 grains.

(*Aloes* 1, *Myrrh* ½ *in* 3.)

Pilula Aloes Socotrinæ.

Pill of Socotrine Aloes.

Socotrine Aloes, in powder	...	2 ounces
Hard Soap, in powder ...	...	1 ounce
Volatile Oil of Nutmeg ...	...	1 fluid drachm
Confection of Roses ...	...	1 ounce.

Beat all together until thoroughly mixed.

This pill may be recognized by the strong odour of nutmeg.

It should be of a very dark brown colour.

Dose—5 to 10 grains.

(1 *in* 2.)

Pilula Asafœtidæ Composita.

Compound Pill of Asafœtida.

Synonym:—Pilula Galbani Composita.

Asafœtida, Galbanum, Myrrh	...	...	... of each 2 ounces
Treacle, by weight	...	...	... 1 ounce.

Heat all together by means of a water-bath, and stir the mass until it assumes a uniform consistence.

This pill is of a dark brown colour. It is best kept in the form of a powder, and the treacle added when required.

Dose—5 to 10 grains.

(*Asafœtida* 1, *Galbanum* 1 *in* 3.)

Pilula Cambogiæ Composita.

Compound Pill of Gamboge.

Gamboge, in powder	1 ounce
Barbadoes Aloes, in powder	1 ounce
Compound Powder of Cinnamon ...	1 ounce
Hard Soap, in powder	2 ounces
Syrup	a sufficiency.

Mix the powders together, add the syrup, and beat the whole into a uniform mass.

The pill is of a brown colour.

Dose—5 to 10 grains.

(*About* 1 *in* 6.)

Pilula Colocynthidis Composita.

Compound Pill of Colocynth.

Synonym:—Pil. Carthartic.

Colocynth Pulp, in powder ...	1 ounce
Barbadoes Aloes, in powder ...	2 ounces
Resin of Scammony, in powder ...	2 ounces
Sulphate of Potassium, in powder ...	$\frac{1}{4}$ ounce
Oil of Cloves	2 fluid drachms
Distilled Water	a sufficiency.

Mix the powder, add the oil of cloves, and beat into a mass with the aid of the water.

This pill has a strong odour of cloves and soon becomes hard. It is generally kept in the form of powder.

Dose—5 to 10 grains.

(*Colocynth* 1, *Aloes* 2, *Scammony* 2 *in* 6.)

Pilula Colocynthidis et Hyoscyami.

Pill of Colocynth and Henbane.

Compound Pill of Colocynth	...	2 ounces
Extract of Henbane ...	...	1 ounce.

Beat them into a uniform mass.

The powdered Pil. Colocynthidis Co. is used in making this, as the pill would make the mass too soft.

Dose—5 to 10 grains.

(*Pil. Coloc. Co.* 2, *Ext. Hyos.* 1 *in* 3.)

Pilula Conii Composita.

Compound Pill of Hemlock.

Extract of Hemlock ...	...	$2\frac{1}{2}$ ounces
Ipecacuanha, in powder ...	...	$\frac{1}{2}$ ounce
Treacle	...	a sufficiency.

Mix the extract of Hemlock and ipecacuanha, and add sufficient treacle to form a pill-mass.

The treacle is not necessary in this pill.

It has a dark olive colour.

Dose—5 to 10 grains.

(*Ext. Conii* $2\frac{1}{2}$, *Ipecac.* $\frac{1}{2}$ *in* 3.)

Pilula Ferri.

Iron Pill.[1]

Sulphate of Iron	... 60 grains
Carbonate of Potassium ...	... 36 „
Refined Sugar, in powder	... 12 „
Tragacanth, in powder ...	... 4 „
Glycerine	... $2\frac{1}{2}$ minims
Distilled Water	... a sufficiency.

Reduce the sulphate of iron to fine powder in a mortar, add the sugar and tragacanth, and mix intimately. Finely powder the carbonate of potassium in another mortar, and thoroughly incorporate with it the glycerine. Transfer this to the mortar containing the sulphate of iron, beat thoroughly until the mass becomes green, and add water, if necessary, sufficient to impart a pilular consistence.

Divide into five-grain pills. Each pill contains about one grain of carbonate of iron.

Dose—1 to 4 pills.

Pilula Ferri Carbonatis.

Pill of Carbonate of Iron.

Saccharated Carbonate of Iron	... 1 ounce
Confection of Roses	... $\frac{1}{4}$ ounce.

Beat them into a uniform mass.

[1] This Iron Pill is commonly known as "Blaud's Pill."

This pill is of a black colour, and becomes very hard on keeping.

Dose—5 to 20 grains.

(1 *in* $1\frac{1}{4}$.)

Pilula Ferri Iodidi.

Pill of Iodide of Iron.

Fine Iron Wire	40 grains
Iodine	80 grains
Refined Sugar, in powder	70 grains
Liquorice Root, in powder	140 grains
Distilled Water	50 minims.

Agitate the iron with the iodine and the water in a strong stoppered ounce phial, until the froth becomes white. Pour the fluid upon the sugar in a mortar, triturate briskly, and gradually add the liquorice.

This pill is of a black colour. If exposed to the air the iron will become oxidized.

Dose—3 to 8 grains.

(*Iodide of Iron* 1 *in* $3\frac{1}{2}$.)

Pilula Hydrargyri.

Mercurial Pill.

Synonym:—*Blue Pill.*

Mercury, by weight	2 ounces
Confection of Roses	3 ounces
Liquorice Root, in fine powder ...	1 ounce.

Rub the mercury with the confection of roses until metallic globules are no longer visible, then add the liquorice, and mix the whole well together.

The pill is of a blue colour. If it becomes too hard, it should be rubbed in a mortar with or without a little water.

The mercury exists principally as the metal in a fine state of division, and to a small extent as oxides.

The confection of roses is used as an excipient, the liquorice root as a basis.

Dose—3 to 8 grains.

(*Mercury* 1 *in* 3.)

Pilula Hydrargyri Subchloridi Composita.

Compound Pill of Subchloride of Mercury.

Synonyms:—Pilula Calomelanos Composita; Plummer's Pill.

Subchloride of Mercury	...	1 ounce
Sulphurated Antimony	...	1 ounce
Guaiacum Resin, in powder	...	2 ounces
Castor Oil		1 fluid ounce, or a sufficiency.

Triturate the subchloride of mercury with the antimony, then add the guaiacum resin and castor oil, and beat the whole into a uniform mass.

This pill becomes partially decomposed by long keeping, chloride of antimony and sulphide of mercury being formed; a little rectified spirit will be found a better excipient than castor oil. The pill is of a bright orange colour.

The castor oil is used to keep the mass soft.

Dose—5 to 10 grains.

(1 *of Calomel in* 5.)

Pilula Ipecacuanhæ cum Scilla.

Pill of Ipecacuanha with Squill.

Compound Powder of Ipecacuanha	3 ounces
Squill, in powder	1 ounce
Ammoniacum, in powder... ...	1 ounce
Treacle	a sufficiency.

Mix the powders, and beat into a mass with the treacle.

This pill is of a brown colour.

Dose—5 to 10 grains.

(3 *of Pulv. Ipecac. Co. in* 7.)

Pilula Phosphori.

Phosphorus Pill.

Phosphorus	3 grains
Balsam of Tolu	120 grains
Yellow Wax	57 grains
Curd Soap	90 grains.

Put the phosphorus and balsam of tolu into a mortar about half full of hot water, and when the phosphorus has melted and the balsam has become sufficiently soft, rub them together beneath the surface of the water until no particles of phosphorus are visible, the temperature of the water being maintained at or near to 140° F. Add now the wax, and as it softens mix it thoroughly with the other ingredients. Allow the mass to cool without being exposed to the air, and keep it immersed in cold water in a bottle.

When dispensed, every two grains of the product is to be incorporated with one grain of the soap; a few drops of rectified spirit being used, if necessary, to soften the whole.

According to the Pharmacopœia 3 grains of the mass so produced, including the soap, contains $\frac{1}{30}$th of a grain of phosphorus.

It however usually contains less than $\frac{1}{30}$th of a grain of phosphorus in 3 grains, in consequence of the hydration of the balsam of tolu.

Dose—2 to 4 grains.

Pilula Plumbi cum Opio.

Pill of Lead and Opium.

Acetate of Lead, in fine powder	...		36 grains
Opium, in powder...	...	...	6 grains
Confection of Roses	...	...	6 grains.

Beat them into a uniform mass.

The pill is of a deep brown colour. The meconate of morphine in the opium acts on the acetate of lead, forming meconate of lead and acetate of morphine.

It has the odour of acetic acid.

The confection of roses is used as an excipient to keep the pill soft. It also facilitates disintegration in the stomach.

Dose—3 to 5 grains.

(*Acetate of Lead* 6, *Opium* 1 *in* 8.)

Pilula Rhei Composita.

Compound Rhubarb Pill.

Rhubarb Root, in powder		...	3 ounces
Socotrine Aloes, in powder		...	$2\frac{1}{4}$ ounces
Myrrh, in powder...	...	...	$1\frac{1}{2}$ ounce
Hard Soap, in powder	...	...	$1\frac{1}{2}$ ounce
Oil of Peppermint...	...	...	$1\frac{1}{2}$ fluid drachm
Glycerine ...	...	...	1 ounce
Treacle, by weight	...	...	about 3 ounces.

Mix the powders with the oil, then add the glycerine and sufficient treacle, and beat the whole into a uniform mass.

It is of a deep brown colour.

This is the only preparation in which powdered myrrh is ordered to be used.

It possesses a strong odour of peppermint.

Dose—5 to 10 grains.

(*Rhubarb* 1 *in* 4 *nearly*; *Aloes* 1 *in* 6.)

Pilula Saponis Composita.

Compound Pill of Soap.

Synonym:—*Pilula Opii.*

Opium, in powder ...	...	...	$\frac{1}{2}$ ounce
Hard Soap, in powder	...	...	2 ounces
Glycerine	...	...	a sufficiency.

Mix the opium and soap, and beat into a uniform mass with the glycerine.

It is of a light brown colour.

Glycerine has been introduced into this pill with the object of keeping the mass soft, which it does; but, as it absorbs too much moisture, the mass is often damp. In the former Pharmacopœia water was used, and answered the purpose very well.

It is called Pil. Saponis Co., to disguise the name of Opium.

Dose—3 to 5 grains.

(1 *of Opium in* 6, *nearly.*)

Pilula Scammonii Composita.

Compound Scammony Pill.

Resin of Scammony	1 ounce
Resin of Jalap	1 ounce
Curd Soap, in Powder	1 ounce
Strong Tincture of Ginger... ...	1 fluid ounce
Rectified Spirit	2 fluid ounces.

Add the spirit and tincture to the soap and resins, and dissolve with the aid of a little heat; then evaporate the spirit by the heat of a water-bath until the mass has acquired a suitable consistence for forming pills.

Dose—5 to 15 grains.

(*Resin of Scammony* 1, *Resin of Jalap* 1 *in* $3\frac{1}{4}$.)

Pilula Scillæ Composita.

Compound Squill Pill.

Squill, in powder...	$1\frac{1}{4}$ ounce
Ginger, in powder...	1 ounce
Ammoniacum, in powder ...	1 ounce
Hard Soap, in powder	1 ounce
Treacle, by weight	2 ounces, or a sufficiency.

Mix the powders, add the treacle, and beat into a uniform mass.

This pill is of a brown colour.

Dose—5 to 10 grains.

(*Squill* 1 *in* 5.)

Pulveres.

Powders.

Some powders are described to have certain degrees of fineness, so as to ensure uniformity. The degrees of disintegration are represented by numbers ranging from No. 20 to 60, indicating the number of parallel wires within a linear inch forming the meshes of the sieves used.

Pulvis Amygdalæ Compositus.

Compound Powder of Almonds.

Synonym :—Confectio Amygdalæ.

Sweet Almonds	...	...	8 ounces
Refined Sugar, in powder	...	...	4 ounces
Gum Acacia, in powder	...	...	1 ounce.

Steep the almonds in water until their skins can easily be removed, and, when blanched, dry them thoroughly with a soft cloth, and rub them lightly in a mortar to a smooth consistence. Mix the gum and the sugar; and, adding them to the almond pulp gradually, rub the whole to a coarse powder. Keep it in a lightly covered jar.

It should be made fresh when required, as it soon becomes rancid.

This is a pale, straw-coloured, coarse powder.

(8 *parts in* 13.)

Pulvis Antimonialis.

Antimonial Powder.

Synonyms :—Pulvis Jacobi ; James' Powder.

Oxide of Antimony	...	...	1 ounce
Phosphate of Calcium	...	...	2 ounces.

Mix them thoroughly.

It is a white powder.

Dose—3 to 5 grains.

(*Oxide of Antimony* 1 *in* 3.)

Pulvis Catechu Compositus.

Compound Powder of Catechu.

Catechu, in powder	...	...	4 ounces
Kino, in powder	...	...	2 ounces
Rhatany Root, in powder	...	...	2 ounces
Cinnamon Bark, in powder	...	...	1 ounce
Nutmeg, in powder	...	...	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It is reddish brown in colour.

Dose—20 to 40 grains.

(1 *of Catechu in* $2\frac{1}{2}$.)

Pulvis Cinnamomi Compositus.

Compound Powder of Cinnamon.

Synonym :—Pulvis Aromaticus.

Cinnamon Bark, in powder	...	...	1 ounce
Cardamom Seeds, in powder	...	...	1 ounce
Ginger, in powder	...	...	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It has a dark fawn colour.

Used in the preparation of Pil. Aloes et Ferri, and Pil. Cambogiæ Co.

Dose—3 to 10 grains.

(1 *of Cinnamon in* 3.)

Pulvis Cretæ Aromaticus.

Aromatic Powder of Chalk.

Synonym :—Confectio Aromatica.

Cinnamon Bark, in powder	4 ounces
Nutmeg, in powder	3 ounces
Saffron, in powder	3 ounces
Cloves, in powder	1½ ounce
Cardamom Seeds, in powder	1 ounce
Refined Sugar, in powder	25 ounces
Prepared Chalk	11 ounces.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

If a product of bright colour be desired, the saffron may previously be moistened and triturated with a little water or spirit, or the fresh and faintly damp mixture may be subjected to considerable pressure in the triturating process.

It has a dark fawn colour.

Dose—10 to 60 grains.

(*About* 1 *of Chalk in* 4.)

Pulvis Cretæ Aromaticus cum Opio.

Aromatic Powder of Chalk and Opium.

Aromatic Powder of Chalk	$9\frac{3}{4}$ ounces
Opium, in powder	$\frac{1}{4}$ ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It is of a dark fawn colour.

Dose—10 to 40 grains.

(*Opium* 1 *in* 40.)

Pulvis Elaterini Compositus.

Compound Powder of Elaterin.

Elaterin	5 grains
Sugar of Milk	195 grains.

Rub them together in a mortar until they are reduced to fine powder and intimately mixed.

This was formerly made with Elaterium.

Dose—$\frac{1}{2}$ grain to 5 grains.

(*Elaterin* 1 *in* 40.)

Pulvis Glycyrrhizæ Compositus.

Compound Powder of Liquorice.

Synonyms:—*Pulvis Glycyrrhizæ Compositus cum Sulphure; Pulvis Pectoralis Kurellæ.*

Senna, in fine powder	2 ounces
Liquorice Root, in fine powder ...	2 ounces
Fennell Fruit, in fine powder ...	1 ounce
Sublimed Sulphur	1 ounce
Refined Sugar, in powder	6 ounces.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar.

Dose—30 to 60 grains.

(*Senna* 1 *in* 6.)

Pulvis Ipecacuanhæ Compositus.

Compound Powder of Ipecacuanha.

Synonym:—*Dover's Powder.*

Ipecacuanha, in powder	½ ounce
Opium, in powder	½ ounce
Sulphate of Potassium, in powder ...	4 ounces.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It is of a light fawn colour.

Dose—5 to 15 grains.

Used in the preparation of Pil. Ipecacuanhæ cum Scilla.

(*Opium* 1 *in* 10.)

Pulvis Jalapæ Compositus.

Compound Powder of Jalap.

Jalap, in powder	5 ounces
Acid Tartrate of Potassium	9 ounces
Ginger, in powder	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar.

It is of a light fawn colour.

Dose—20 to 60 grains.

(*Jalap* 1 *in* 3.)

Pulvis Kino Compositus.

Compound Powder of Kino.

Kino, in powder	$3\frac{3}{4}$ ounces
Opium, in powder	$\frac{1}{4}$ ounce
Cinnamon Bark, in powder	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It is of a reddish-brown colour.

Dose—5 to 20 grains.

(*Opium* 1 *in* 20.)

Pulvis Opii Compositus.

Compound Powder of Opium.

Opium, in powder	$1\frac{1}{2}$ ounce
Black Pepper, in powder	2 ounces
Ginger, in powder	5 ounces
Caraway Fruit, in powder	6 ounces
Tragacanth, in powder	$\frac{1}{2}$ ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar. Keep it in a stoppered bottle.

It is of a light olive-brown colour.

Dose—2 to 5 grains.

Used in the preparation of Confectio Opii.

(*Opium* 1 *in* 10.)

Pulvis Rhei Compositus.

Compound Powder of Rhubarb.

Synonym :—Gregory's Powder.

Rhubarb Root, in powder	...	...	2 ounces
Light Magnesia	...	...	6 ounces
Ginger, in powder	...	...	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and preserve in a well-closed bottle in a dry place.

The more free the powdered rhubarb is from oil, and the more recently prepared the magnesia, the more readily will the powder mix with water. If a more condensed powder be desired, heavy magnesia may be employed.

Dose—20 to 60 grains.

(*Rhubarb* 1 *in* $4\frac{1}{2}$.)

Pulvis Scammonii Compositus.

Compound Powder of Scammony.

Scammony Resin, in powder	...	...	4 ounces
Jalap, in powder	...	...	3 ounces
Ginger, in powder	...	...	1 ounce.

Mix them thoroughly, pass the powder through a fine sieve, and finally rub it lightly in a mortar.

It is of a light olive-brown colour.

Dose—10 to 20 grains.

(*Scammony Resin* 1 *in* 2.)

Pulvis Sodæ Tartaratæ Effervescens.

Effervescent Tartarated Soda Powder.[1]

Tartarated Soda, in dry powder	...	120 grains
Bicarbonate of Sodium, in dry powder		40 grains.

[1] Effervescent Tartarated Soda Powder is commonly known as "Seidlitz Powder."

Mix, and wrap in blue paper.

Tartaric Acid, in dry powder ... 38 grains.

Wrap in white paper.

Dose—The former powder, dissolved in nearly half a pint of cold or warm water, and the latter powder then added.

Pulvis Tragacanthæ Compositus.

Compound Powder of Tragacanth.

Tragacanth, in powder
Gum Acacia, in powder } of each ... 1 ounce
Starch, in powder

Refined Sugar, in powder ... ... 3 ounces.

Rub them well together.

Dose—20 to 60 grains.

(*Tragacanth* 1 *in* 6.)

Pyroxylin.

Pyroxylin.

Synonym:—Gun Cotton.

This is prepared by dipping 1 ounce of cotton wool into a mixture of equal parts of strong sulphuric acid and nitric acid (10 ounces in all), and stirring with a glass rod for 3 minutes until it is thoroughly moistened: the cotton is then withdrawn and thoroughly washed in water until the washings cease to give a precipitate with chloride of barium; it is then cautiously dried in a water-bath.

It should be entirely soluble in a mixture of rectified spirit and ether, and leave no residue when exploded by heat.

Used in the preparation of Collodium and Collodium Vesicans.

Saccharum Lactis ($C_{12}H_{24}O_{12}$).

Sugar of Milk.

Synonym :—Lactose.

This substance gives the sweet taste to fresh milk. It is procured by evaporating the whey of fresh milk, after the separation of the casein and oil. It is usually met with in large crystalline masses 2 inches in diameter, with a cord or stick in the axis. It is prepared in Switzerland from whey, in the manufacture of Gruyere cheese. It is white, hard, and gritty, and only slightly sweet to the taste, soluble in about 7 parts of water at common temperatures, and 1 part of boiling water. It does not form a syrup. It is insoluble in alcohol and ether. Its aqueous solution turns a ray of polarized light to the right. Dilute acids convert it into glucose. Nitric acid converts it into oxalic and mucic acid. Lactose differs from other sugars, and resembles gums, in producing the last-mentioned acid with nitric acid.

Used in the preparation of Pulvis Elaterini Compositus.

Saccharum Purificatum ($C_{12}H_{22}O_{11}$).

Refined Sugar.

There are two leading varieties of sugar : Cane-sugar, (*Sucrose*) and Grape-sugar (*Glucose*).

Sugar is chiefly obtained from the sugar-cane, each gallon of its juice yielding about a pound ; it is also derived from beetroot, which yields from 4 to 5 per cent. ; from the sap of the sweet maple, and from other sources, especially from the stalks of Indian corn or maize, the juice of which is nearly as rich in sugar as that of the sugar-cane. Several of the palm tribe, such as the date or cocoa-palm, are also important sources of sugar.

The general characters of cane-sugar, and its ordinary commercial varieties, are well known. Its sp. gr. is about 1·6. It is readily and completely soluble in water, forming a clear bright syrup, which affords, by spontaneous evaporation, prismatic crystals known as *candy*. A solution saturated at 230° F. concretes into a granular mass or tablet; but when boiled down till it acquires a tendency to vitreous fracture on cooling, or till a portion thrown off from a stirrer, concretes, or *feathers*, as it falls, it congeals into a transparent amorphous mass (*barley-sugar*), which, however, has a tendency to become opaque, and pass into a granular crystalline texture, exhibiting a case of dimorphism; this change is prevented by the addition of a little vinegar or tartaric acid. Absolute alcohol dissolves about one 80th of its weight of this sugar at its boiling-point, nearly the whole of which separates in small crystals on cooling. Pure cane-syrup is not prone to change; but certain substances, when present only in very minute proportions, materially affect the stability of the solution. It does not reduce an alkaline solution of oxide of copper, until, by the agency of an acid, it has been converted into glucose.

Used in the preparation of the following compounds :—

Conf. Rosæ Caninæ
,, ,, Gallicæ
,, Sennæ
Ext. Sarsæ Liq.
Ferri Carbonas Saccharata
Liq. Calcis Saccharatus
Mist. Ferri Composita
,, Guaiaci
Mist. Spiritus Vini Gallici
Pil. Ferri Iodidi
Pulv. Amygdalæ Co.
,, Cretæ Aromaticus
,, Glycyrrhizæ Co.
,, Tragacanthæ Co.
Sodii Citro-tartras Effervescens

All the Syrups and Lozenges.

Soaps.

The term soap is applied to the combination of a fatty acid with a base.

There are 8 official soaps, viz.:

Hard Soap	(oleate and stearate of sodium).
Soft ,,	(,, ,, potassium).
Curd ,,	(principally stearate of sodium).
Ammonium Soap	(oleate of ammonium, as in Linimentum Ammoniæ).
Lime Soap	(oleate of calcium, as in Lin. Calcis).
Lead ,,	(oleate and stearate of lead, as in Emplastrum Plumbi).
Mercury Soap	(oleate of mercury).
Zinc ,,	(oleate of zinc).

Sapo Durus.

Hard Soap.

Synonym :—White Castile Soap.

Hard soap is prepared officially by boiling together olive oil and caustic soda.

It is a greyish-white, dry, inodorous substance, horny and pulverizable when kept in dry warm air. Easily moulded when heated. Soluble in rectified spirit. Soluble also in hot water, the solution being neutral or only faintly alkaline to test-paper. It does not impart a greasy stain to paper. Incinerated it yields an ash which does not deliquesce.

Used in the preparation of Lin. Saponis; Pil. Aloes Barb.; Pil. Aloes et Asafœtidæ; Pil. Aloes Soc.; Pil. Cambogiæ; Pil. Rhei Co.; Pil. Saponis Co.; and Pil. Scillæ Co.

Commercial hard soaps are chiefly made with tallow or some vegetable oil, such as palm oil or cocoa-nut oil, and caustic soda (*impure carbonate of sodium*). When the ley is raised to its boiling-point, the tallow or oil is gradually added so long as the ley is saponified by it, and in this way

a liquid is formed which holds the soap and glycerine in solution ; to separate the former common salt is added. Soap being insoluble in brine is thus brought to float on the surface, and, if the brine is concentrated, the soap separates nearly in an anhydrous state.

New soap is said to contain about 50 per cent. of water, and to retain above 30 per cent. when comparatively hard and dry. There is, therefore, a manifest advantage to the consumer in purchasing dry and old soap, while the object of the vendor is to sell the soap as humid as possible ; it is therefore generally kept in damp cellars.

Soap is sometimes mottled (*coloured or marbled*), by the addition of colouring matters, such as oxide of manganese, &c. Sometimes a solution of sulphate of iron is used, which, being decomposed, causes the diffusion of oxide of iron through the soap ; in this case the mottling is originally black, but becomes red or brown upon the exterior of the bars in consequence of the action of the air. A considerable quantity of common resin is added to the yellow soap of commerce.

Sapo Animalis.

Curd Soap.

This is a soap made with soda and some purified animal fat composed principally of stearine, such as suet, &c.

It is white, or of a very light greyish tint ; dry ; nearly inodorous ; horny and pulverizable when kept in dry warm air. Easily moulded when heated. Soluble in rectified spirit, soluble also in hot water, the solution being neutral or only very faintly alkaline to test-paper. It does not impart a greasy stain to paper. Incinerated it yields an ash which does not deliquesce.

Used in the preparation of the following compounds :—

Emplastrum Resinæ.
,, Saponis.
,, ,, Fuscum.
Extractum Colocynthidis Compositum.
Linimentum Potassii Iodidi cum Sapone
Pilula Phosphori.
,, Scammonii Composita.
Suppositoria Acidi Carbolici cum Sapone.
,, ,, Tannici cum Sapone.
,, Morphinæ cum Sapone.

Sapo Mollis.

Soft Soap.

Officially it is prepared by boiling together caustic potash and olive oil, and consists of oleate and stearate of potassium.

When pure it is of a tawny-yellow, but commercially of a yellowish-green colour; inodorous, and of a gelatinous consistence. Soluble in rectified spirit; not imparting an oily stain to paper. Incinerated it yields an ash which is very deliquescent.

Used in the preparation of Linimentum Terebinthinæ.

Commercial soft soap is frequently made with fish oil in the same way as hard soap, substituting common caustic potash (impure carbonate of potassium) for caustic soda.

The soap cannot be separated from the glycerine by the addition of common salt, as that would decompose it into hard soap; it is merely evaporated down.

Transparent Soap is obtained by dissolving soap in alcohol, which is afterwards distilled off so as to leave a brown transparent residue, which is dried in moulds or balls.

Hard Water Soap is ordinary hard soap containing an excess of caustic soda.

Sevum Præparatum.

Prepared Suet.

The internal fat of the abdomen of the sheep, Ovis Aries, purified by melting and straining.

It is white, smooth, and almost scentless; fusible at 103° F.

Used in the preparation of Emp. Cantharidis and Ung. Hydrargyri.

Spiritus.

Spirits.

There are 18 official spirits, which are chiefly solutions of essential oils in rectified spirit.

Most of them are prepared by dissolving 1 part of essential oil in 49 parts of rectified spirit, the exceptions being spirit of camphor (1 in 10), spirit of chloroform (1 in 20), and spirit of ether (1 in 3).

When poured into water most of them become turbid, due to the separation of the essential oil.

Spiritus Ætheris.

Spirit of Ether.

Ether	10 fluid ounces
Rectified spirit	1 pint.

Mix.

Specific gravity 0·809.

Dose—30 to 90 minims.

Used in the preparation of Tinctura Lobeliæ Ætherea.

Spiritus Ætheris Compositus.

Compound Spirit of Ether.

Synonym :—Hoffmann's Anodyne.

Gradually mix 36 fluid ounces of sulphuric acid with 40 fluid ounces of rectified spirit, and let the mixture stand 24 hours. Then distil until the fluid in the retort begins to blacken. Shake the distillate with lime-water to neutralize any acid, and remove the supernatant liquor and expose it to the air for about 12 hours. Pour 3 fluid drachms of the resulting liquid into a mixture of 8 fluid ounces of ether and 16 fluid ounces of rectified spirit.

Dose—30 minims to 2 fluid drachms.

Spiritus Ætheris Nitrosi.

Spirit of Nitrous Ether.

Synonyms :—Spiritus Ætheris Nitrici; Sweet Spirit of Nitre.

A spirituous solution containing nitrous compounds, aldehyd, and other substances. It may be obtained as follows :

Nitric Acid	3 fluid ounces
Sulphuric Acid	2 fluid ounces
Copper, in fine wire (about No. 25)	2 ounces
Rectified Spirit	a sufficiency.

To one pint of the spirit add gradually the sulphuric acid, stirring them together; then add, in the same way, $2\frac{1}{2}$ fluid ounces of the nitric acid. Put the mixture into a retort or flask into which the copper has been introduced, and to which a thermometer is fitted. Attach now an efficient condenser, and applying heat gently, let the spirit distil at a temperature commencing at 170° F., and rising to 175° F., but not exceeding 180° F., until 12 fluid ounces have passed over and been collected in a bottle, the latter and the condenser being kept cool with ice-cold water. Then withdraw the heat, and having allowed the contents

of the retort to cool, introduce the remaining ½ ounce of nitric acid, and resume the distillation as before, until the distilled product has been increased to 14 fluid ounces. Mix this with two pints of the rectified spirit, or as much as will make the product correspond to the nitric oxide test alluded to on pages 269 and 270. Preserve the product in thoroughly well closed full vessels, and in a cool place. A higher temperature than 180° F. would form a mixture of ether, olefiant gas, and other products, and might produce an explosion.

The small quantity of nitric acid added near the end of the process is to ensure nothing but nitrous ether distilling over.

The decompositions may be expressed as follows:

1st. The copper abstracts oxygen from the nitric acid, reducing it to nitrous acid and forming oxide of copper.

$$HNO_3 + Cu = \underset{\text{Nitrous Acid.}}{HNO_2} + CuO.$$

2nd. The nitrous acid so produced then reacts with the alcohol, forming nitrite of ethyl, which distils over.

$$C_2H_5HO + HNO_2 = \underset{\text{Nitrite of Ethyl.}}{C_2H_5NO_2} + H_2O.$$

3rd. The sulphuric acid combines with the oxide of copper, and so prevents it combining with the nitric acid.

$$CuO + H_2SO_4 = Cu\ SO_4 + H_2O.$$

Or the decompositions may be shown in one equation as follows:

$$\underset{\text{Alcohol.}}{3C_2H_5HO} + \underset{\text{Nitric Acid.}}{2HNO_3} + \underset{\text{Copper.}}{Cu} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} =$$

$$\underset{\text{Nitrous Ether.}}{2C_2H_5NO_2} + \underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Copper Sulphate.}}{CuSO_4} + \underset{\text{Water.}}{4H_2O}.$$

A quantity of aldehyd always distils over during the process, due to the oxidizing effect of the nitric acid on the alcohol.

$$\underset{\text{Alcohol.}}{C_2H_6O} + \underset{\text{Nitric Acid.}}{HNO_3} = \underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Water.}}{H_2O} + \underset{\text{Nitrous Acid.}}{HNO_2}.$$

Spirit of nitrous ether is a transparent and nearly colour-

less liquid, with a very slight tinge of yellow, mobile, inflammable, of a peculiar penetrating apple-like odour, and sweetish cooling sharp taste. Specific gravity 0·840 to 0·845. It does not effervesce, or only feebly, when shaken with a little bicarbonate of sodium (*absence of free acid*). When agitated in a test-tube with a strong solution of sulphate of iron, if a few drops of strong sulphuric acid are then poured down the side of the tube, a deep olive-brown or black zone is produced, widening as the tube is gently shaken. Tested as described on page 269, it should yield, at the ordinary temperature (60° F.) and pressure (30 in. or 760 millimetres of mercury), and when freshly prepared, 7 times its volume of nitric oxide gas ; and even after it has been kept some time, and the vessel containing it has occasionally been opened, it should yield not much less than 5 times its volume of the gas.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Sweet spirit of nitre is frequently acid, due to the presence of nitrous and acetic acids. The acetic acid is produced by the oxidation of the aldehyd.

$$\underset{\text{Aldehyd.}}{C_2H_4O} + O = \underset{\text{Acetic Acid.}}{HC_2H_3O_2}.$$

In dispensing sweet spirit of nitre with iodide of potassium, the former must be rendered neutral, otherwise the nitrous acid would liberate iodine, and so turn the mixture brown.

Sweet spirit of nitre, as prepared according to the London Pharmacopœia, always contained much aldehyd. It was prepared by distilling nitric acid and alcohol together.

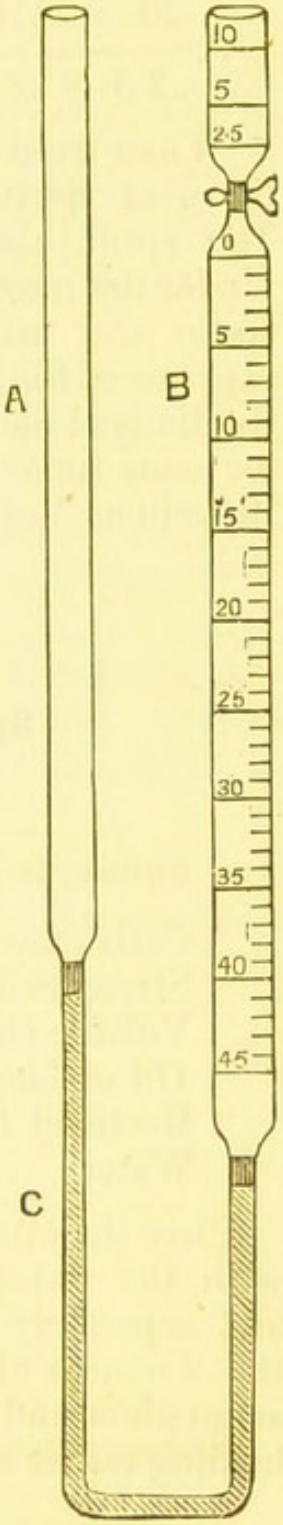
Spirit of nitrous ether is assayed by ascertaining the amount of nitrite it contains. This is done by reduction of the nitrous acid to nitric oxide gas, which is measured in a closed tube. In Allen's process the reaction is as follows :

$$C_2H_5NO_2 + KI + H_2SO_4 = C_2H_6O + NO + KHSO_4 + I,$$

whence it is evident that, for every molecule of nitrous

ether one molecule of nitric oxide is liberated. The Pharmacopœia proportion of 7 times the volume of the spirit indicates nearly 3 per cent. of real nitrous ether.

The accompanying illustration represents an ordinary Nitrometer.



A. Is a long plain tube of 40 c.c. capacity.

B. A calibrated burette tube with a stopcock, and upper limb graduated to 10 c.cs.

C. Indiarubber tubing connecting the two tubes.

Process of Estimation.

Tube A is raised until its lower end is almost level with the stopcock of B; the stopcock being opened brine is introduced by A, until it rises to the stopcock, which is then shut. Tube A is now lowered so that it is level with B. Ten c.c. of a solution of potassium iodide is poured into the upper limb of B, and then the stopcock slowly opened, when it runs in, care being taken to close the tube the instant all the solution has flowed in; 10 c.c. of dilute sulphuric acid is then added in the same manner, and after this 2·5 c.c. of spirit of nitrous ether, and if needful 2·5 c.c. of water; the stopcock being firmly held in the hand, the tube is rapidly shaken, and the level of the liquid in the tubes adjusted, and the volume of gas read off. The calculation is made thus :—

$$\frac{\text{The volume of gas} \times \cdot 3185}{\text{quantity taken} \times \text{specific gravity}} = \text{per cent. of ethyl nitrite.}$$

Example :—

2·5 c.c. gave 20 c.c. of gas. The specific gravity of the spirit was ·840 (·3185 is the factor for *ordinary* temperature, *i.e.* 60° F.).

$$\therefore \frac{20 \times \cdot 3185}{2 \cdot 5 \times \cdot 840} = 3 \cdot 06 \text{ per cent. of absolute ethyl nitrite.}$$

When fresh the spirit should yield 35 c.c. of gas from 5 c.c. of spirit (or 643 grain-measures from 100 minims). The spirit also contains about 0·5 per cent. of aldehyd. Under the most favourable conditions the spirit deteriorates, acetic and nitrous acids and aldehyd being present at the expense of the nitrous ether. But the Pharmacopœia fixes the limit of deterioration by stating that after being kept for some time "it should yield not much less than five times its volume" of nitric oxide.

Spiritus Ammoniæ Aromaticus.

Aromatic Spirit of Ammonia.

Synonyms :—Spiritus Ammoniæ Co.; Sal Volatile.

Carbonate of Ammonium	...	4 ounces
Strong Solution of Ammonia	...	8 fluid ounces
Volatile Oil of Nutmeg...	...	$4\frac{1}{2}$ fluid drachms.
Oil of Lemon	...	$6\frac{1}{2}$ „ „
Rectified Spirit... ...	...	6 pints
Water	...	3 „

Place the oils of lemon and nutmeg and the rectified spirit with the water in a retort; distil 7 pints, and then distil and separately collect an additional 9 fluid 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. Securely cork the bottle

and gently warm it in a water-bath to 140° F., shaking from time to time until all the salt has dissolved. Filter, if necessary, when cold through a little cotton wool, and gradually mix it with the 7 pints of distilled spirit. The product should measure 1 gallon.

Sp. gr. ·896.

One fluid ounce requires for neutralisation 558 grain-measures of the volumetric solution of oxalic acid. One fluid ounce, after the addition of 330 grain-measures of the test solution of chloride of barium, should yield, after filtration, a further precipitate, when more of the reagent is added.

The spirit and volatile oils only are distilled, the carbonate of ammonium and hydrate of ammonium being added afterwards.

It contains about $1\frac{1}{2}$ per cent. of ammonia gas and $3\frac{1}{2}$ per cent. of neutral carbonate of ammonium. Commercial specimens vary.

The strong solution of ammonia is used to convert the carbonate of ammonium into the normal carbonate; excess of solution of ammonia is used in order to give the spirit a pungent odour.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Used in the preparation of Tinctura Guaiaci Ammoniata, and Tinctura Valerianæ Ammoniata.

Spiritus Ammoniæ Fœtidus.

Fetid Spirit of Ammonia.

Asafœtida	$1\frac{1}{2}$ ounce
Strong Solution of Ammonia	2 fluid ounces
Rectified Spirit	a sufficiency.

Break the asafœtida into small pieces, and macerate it in a closed vessel, in 15 fluid ounces of the spirit for 24 hours,

then distil off the spirit, mix the product with the solution of ammonia, and add sufficient rectified spirit to make one pint.

Specific gravity about 0·847.

This preparation is a spirituous solution of the volatile oil of asafœtida and ammonia.

The spirit is colourless when freshly prepared, but becomes yellow on keeping.

Dose—½ to 1 fluid drachm.

Spiritus Armoraicæ Compositus.

Compound Spirit of Horseradish.

Horseradish Root, scraped Bitter-Orange Peel, cut small and bruised	}	of each 20 ounces
Nutmeg, bruised...		½ ounce
Proof Spirit		1 gallon
Water		3 pints.

Mix and distil a gallon.

The distillate consists of a solution of the volatile oils of horseradish, orange, and nutmeg; if the spirit was not diluted, no volatile oil of horseradish would be formed. This preparation should be made in early spring or late autumn, as the root is most active then.

An improvement in making this preparation would be to macerate the ingredients for some hours with water before distilling. Horseradish, like mustard, does not contain any volatile oil, but it is developed by treatment with water.

Specific gravity about 0·920.

Dose—1 to 2 fluid drachms.

Spiritus Cajuputi.

Spirit of Cajuput.

Oil of Cajuput	1 fluid ounce
Rectified Spirit	49 fluid ounces.

Dissolve.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Spiritus Camphoræ.

Spirit of Camphor.

Synonym :—Camphorated Spirit.

Camphor	1 ounce
Rectified spirit	9 fluid ounces.

Dissolve.

Specific gravity about 0·850.

Dose—10 to 30 minims.

Spiritus Chloroformi.

Spirit of Chloroform.

Synonyms :—Chloric Ether ; Spirit of Chloric Ether.

Chloroform	1 fluid ounce
Rectified Spirit	19 fluid ounces.

Dissolve.

Test—Specific gravity 0·871.

Dose—20 to 60 minims.

Spiritus Cinnamomi.

Spirit of Cinnamon.

Oil of Cinnamon...	1 fluid ounce
Rectified Spirit	49 fluid ounces.

Dissolve.

Dose—½ to 1 drachm.

Used in the preparation of Acidum Sulphuricum Aromaticum.

Spiritus Juniperi.

Spirit of Juniper.

Oil of Juniper	1 fluid ounce
Rectified Spirit...	49 fluid ounces.

Dissolve.

Dose—½ to 1 fluid drachm.

Used in the preparation of Mistura Creasoti.

Spiritus Lavandulæ.

Spirit of Lavender.

Oil of Lavender	1 fluid ounce
Rectified Spirit	49 fluid ounces.

Dissolve.

Dose—½ to 1 fluid drachm.

Spiritus Menthæ Piperitæ.

Spirit of Peppermint.

Oil of Peppermint	...	...	1 fluid ounce
Rectified Spirit	...	...	49 fluid ounces.

Dissolve.

Dose—½ to 1 fluid drachm.

Spiritus Myristicæ.

Spirit of Nutmeg.

Volatile oil of Nutmeg...		...	1 fluid ounce.
Rectified Spirit	...	...	49 fluid ounces.

Dissolve.

Dose—½ to 1 fluid drachm.

Used in the preparation of Mistura Ferri Composita.

Spiritus Rosmarini.

Spirit of Rosemary.

Oil of Rosemary	...	...	1 fluid ounce
Rectified Spirit	...	...	49 fluid ounces.

Dissolve.

Dose—½ to 1 fluid drachm.

Spiritus Rectificatus.

Rectified Spirit.

Alcohol (C_2H_5HO) with 16 per cent. of water; obtained by the distillation of fermented saccharine fluids.

There are four principal stages in the manufacture of spirits, viz., *grinding*, *mashing*, *fermenting*, and *distilling*.

Grinding.—The grain is placed in a room immediately over the mill-chamber, and discharged through trap-doors into cloth sleeves, which conduct it to the hoppers leading to the mill-room. In this room the millstones grind all the raw grain, while the malt is passed through a crushing mill. From the grinders the meal is conducted into sacks.

Mashing.—The mash tun, which is circular in shape, is furnished with a false bottom, pierced with holes like a strainer. From the middle of the tun rises a vertical shaft with horizontal mechanism. This, by rotating horizontally and vertically, agitates the whole of the liquor in the tun. Previous to introducing the malt, a quantity of water, at a temperature between 140° and 150° F., is run into the mash tun, and the ground malt and meal are then added. The perforated false bottom allows the wort to percolate into the space between it and the true bottom of the tun, from which it is drawn off more easily into vessels placed beneath the mash tun, till pumped into the coolers.

During the operation of mashing, the diastase dissolves in the tepid water and immediately reacts upon the starch of the malt, converting it into dextrine and maltose.

Fermentation.—This is the most important stage through which the materials have to pass. Fermentation is produced by adding to the wort about 2 per cent. of brewer's yeast. The time occupied by the fermentation varies between 3 and 9 days. The first few days the tuns are exposed as much as possible to the atmosphere; after this time they are covered tightly to exclude the air. The temperature most favourable for fermentation is between 70° to 75° F.; care must be taken to prevent the temperature exceeding 95° F. in order to avoid acetification.

Distillation.—The philosophy of distilling rests upon the different degrees of volatility of the bodies subjected to the operation. If a mixture of water and alcohol be introduced into a still, the mixture will boil at an inter-

mediate temperature, proportionate to the quantity of each liquid present ; the alcohol being the more volatile is driven over first, carrying with it some aqueous vapour ; as the boiling continues more water is given off, until, at the end of the operation, aqueous vapour only passes over. When the mixed vapours are conducted through a tube placed in water below 212° F., but not so low as the boiling-point of the alcohol, the water is condensed, and the alcohol vapour remains unaffected until it traverses the worm, to where the temperature is below its boiling-point ; there it becomes liquid.

Rectified spirit is a colourless, transparent, very mobile and inflammable liquid, of a characteristic pleasant odour, and a strong spiritous burning taste. Burns with a blue flame without smoke. Specific gravity 0·838. Remains clear when diluted with distilled water (*absence of fousel oil*). A little rubbed on the back of the hand leaves no unpleasant smell after the spirit has evaporated : 4 fluid ounces with 30 grain-measures of the volumetric solution of nitrate of silver exposed for twenty-four hours to bright light and then decanted from the black powder which has formed, undergoes no further change when again exposed to light with more of the test (*absence of fousel oil and aldehyd*).

Rectified spirit is used in the preparation of the following tinctures :—

Tinctura Aconiti
„ Arnicæ
„ Asafœtidæ
„ Aurantii Recentis
„ Benzoini Co.
„ Cannabis Indicæ
„ Capsici
„ Cinnamomi
„ Cubebæ
„ Iodi
„ Laricis
Tinctura Lavandulæ Co.
„ Myrrhæ
„ Opii Ammon.
„ Podophylli
„ Pyrethri
„ Sumbul
„ Tolutana
„ Veratri Viridis
„ Zingiberis
„ „ Fortior

Spiritus Tenuior.

Proof Spirit.

This is a weaker form of alcohol than rectified spirit. It contains by weight about 49 per cent., and by volume 57 per cent., of absolute alcohol. Specific gravity 0·920.

It is prepared officially by mixing 5 pints of rectified spirit with 3 pints of distilled water. When mixed it does not yield 8 volumes, there being a contraction of about $2\frac{1}{2}$ per cent.; 6 of spirit and 10 of water will give $15\frac{1}{2}$ volumes of the mixture.

This contraction is believed to be due to the alcohol forming a molecular compound with the water, which compound occupies a smaller bulk than its constituents. Warmth is also produced on mixing the rectified spirit with the water; this is due to some of the latent heat of the spirit and water becoming converted into sensible heat. After mixing, molecular condensation takes place, due to the formation of hydrate, so that the volume will be less than the original volumes of spirit and water.

When alcohol is mixed with water it often turns turbid, due to presence of dissolved air.

A spirit 56 per cent. over proof, is one, of which, 100 volumes contain as much real alcohol as 156 volumes of proof spirit.

Similarly, a spirit of 60 per cent. over proof would mean that 100 volumes of the spirit contain as much real alcohol as 160 volumes of proof spirit.

Proof spirit, according to Act of Parliament, is a spirit that shall weigh *twelve-thirteenths* of an equal volume of distilled water at 60° F., *i.e.*, 13 fluid ounces would weigh 12 ounces. Such a spirit agrees with the Pharmacopœia, proof spirit having a sp. gr. of ·9198, and containing 49·25 per cent. by weight of real alcohol.

Methylated spirit is a mixture of 90 per cent. of rectified spirit and 10 per cent. of methylic alcohol (wood spirit).

Spiritus Vini Gallici.

French Brandy.

A spirit distilled from French wine, deriving its colour from the cask in which it has been kept; contains about 55 per cent. by volume of alcohol.

Used in the preparation of Mistura Spiritus Vini Gallici.

Succi.

Juices.

These are liquids expressed from the fresh plants bruised, or some portion of the plants.

There are 7 official juices, viz. :—

S. Belladonnæ,
S. Hyoscyami,
S. Mori,
S. Conii,
S. Limonis,
S. Scoparii,
S. Taraxaci.

Succus Limonis is the freshly expressed juice of the ripe fruit of the lemon (*Citrus Limonum*). It contains from 36 to 46 grains of citric acid in 1 fluid ounce.

To preserve the juice, it should be heated to 150° F., filtered and kept in bottles completely filled. A small quantity of alcohol added to the fresh juice will prevent decomposition.

Succus Mori is the juice of the ripe fruit of the mulberry (*Morus nigra*). It is deep purple in colour.

The remainder are prepared by bruising the fresh drugs in a stone mortar, pressing out the juice, and to every 3 measures of juice adding 1 of rectified spirit, setting aside for 7 days, and filtering.

They should be kept in a cool place.

The spirit precipitates mucilaginous and albuminous matter.

Succus Belladonnæ.

Juice of Belladonna.

Fresh leaves and young branches of Belladonna	7 pounds
Rectified Spirit	a sufficiency.

Bruise the belladonna in a stone mortar, press out the juice, and to every 3 measures of juice add 1 of the spirit. Set aside for 7 days, and filter. Keep it in a cool place.

Dose—5 to 15 minims.

Succus Conii.

Juice of Hemlock.

Fresh leaves and young branches of Hemlock	7 pounds
Rectified Spirit	a sufficiency.

Bruise the hemlock in a stone mortar, press out the juice, and to every 3 measures of juice add 1 of the spirit. Set aside for 7 days, and filter. Keep it in a cool place.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

12 minims equal 1 grain of extract.

Used in the preparation of Cataplasma Conii, and Vapor Coninæ.

Succus Hyoscyami.

Juice of Henbane.

Fresh leaves, flowering tops, and young branches of Henbane	7 pounds
Rectified Spirit	a sufficiency.

Bruise the henbane in a stone mortar, press out the juice, and to every 3 measures of juice add 1 of the spirit. Set aside for 7 days, and filter. Keep it in a cool place.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Succus Scoparii.

Juice of Broom.

Fresh Broom tops	7 pounds
Rectified Spirit	a sufficiency.

Bruise the broom tops in a stone motar, press out the juice, and to every 3 measures of juice add 1 of the spirit. Set aside for 7 days, and filter. Keep it in a cool place.

It is dark brown in colour.

Dose—1 to 2 fluid drachms.

Succus Taraxaci.

Juice of Dandelion.

Fresh Dandelion root	7 pounds
Rectified Spirit	a sufficiency.

Bruise the dandelion root in a stone mortar, press out the juice, and to every 3 measures of juice add 1 of the spirit. Set aside for 7 days, and filter. Keep it in a cool place.

It is of a deep brown colour.

Dose—1 to 2 fluid drachms.

Suppositoria.

Suppositories.

There are 9 official suppositories. These are conical-shaped solids, intended for administration by way of the rectum; some are made with cacao butter, others with a mixture of starch, soap, and glycerine.

Oil of theobroma is preferred because of its low melting point, which is below the temperature of the body, and also for its good keeping qualities.

The weight of each suppository is about 15 grains.

Carbolic acid suppositories formerly contained starch; now they contain glycerine of starch.

Tannic acid suppositories of the previous edition of the Pharmacopœia were made with benzoated lard, white wax, and oil of theobroma; now they are prepared with oil of theobroma alone.

The same alteration has been made in mercurial, morphine, and compound lead suppositories.

Table of Strengths.

S. Acidi Carbolici cum Sapone contain 1 grain of carbolic acid in each.

S. Acidi Tannici contain 3 grains of tannic acid in each.

S. Acidi Tannici cum Sapone contain 3 grains of tannic acid in each.

S. Hydrargyri contain 5 grains of ointment of mercury in each.

S. Iodoformi contain 3 grains in each.

S. Morphinæ contain $\frac{1}{2}$ grain of hydrochlorate of morphine in each.

S. Morphinæ cum Sapone contain $\frac{1}{2}$ grain of hydrochlorate of morphine in each.

S. Plumbi Co. contain 3 grains of acetate of lead and 1 grain of opium in each.

S. Glycerini contain 70 per cent. by weight of glycerine.

Suppositoria Acidi Carbolici cum Sapone.

Carbolic Acid Suppositories.

Carbolic Acid	12 grains
Curd Soap, in powder	180 grains
Glycerine of Starch...	40 grains, or a sufficiency.

Mix the ingredients so as to form a paste of suitable consistence. Divide the mass into 12 equal parts, each of which is to be made into a conical or other convenient form for a suppository.

Each suppository contains 1 grain of carbolic acid.

Suppositoria Acidi Tannici.

Tannic Acid Suppositories.

Tannic Acid	36 grains
Oil of Theobroma	144 grains.

Rub the tannic acid with 44 grains of the oil of theobroma in a slightly warmed mortar, and add them to the remainder of the oil of theobroma previously melted at a low temperature : mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains ; or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form for a suppository.

Each suppository contains 3 grains of tannic acid. They are of a light drab colour.

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 the tannic acid with the glycerine of starch and soap, and add sufficient starch to form a paste of suitable consistence. Divide the mass into 12 equal parts, each of which is to be made into a conical or other convenient form for a suppository.

Each suppository contains 3 grains of tannic acid.

Suppositoria Glycerini.

Glycerine Suppositories.

Gelatine, cut small	...	...	$\frac{1}{2}$ ounce
Glycerine, by weight	...	...	$2\frac{1}{2}$ ounces
Distilled Water	...	...	a sufficiency.

Place the gelatine in a weighed evaporating dish with sufficient water to cover it; after allowing it to stand for a minute or two pour away the excess of water; set aside until the gelatine is quite soft, then add the glycerine. Dissolve over a water-bath, and evaporate until the mixture weighs 1560 grains. Pour the product into suppository moulds holding thirty, sixty, or one hundred and twenty grain-measures, or having other capacities, as required. Each suppository contains seventy per cent. by weight of glycerine.

Suppositoria Hydrargyri.

Mercurial Suppositories.

Ointment of Mercury	... ...	60 grains
Oil of Theobroma	... ...	120 grains.

Melt the oil of theobroma with sufficient heat, then add the ointment of mercury, and having mixed them thoroughly, without applying more heat, immediately pour the mixture, before it has congealed, into suitable moulds of the capacity of 15 grains; or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form for a suppository.

Each suppository contains 5 grains of ointment of mercury.

They are of a light blue colour.

Suppositoria Iodoformi.

Iodoform Suppositories.

Iodoform, in powder...	... ...	36 grains
Oil of Theobroma	... ...	144 grains.

Rub the iodoform with 44 grains of the oil of theobroma in a slightly warmed mortar, and add this to the remainder of the oil of theobroma previously melted at a low temperature; mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains; or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form for a suppository.

Each suppository contains 3 grains of iodoform.

They are of a yellow colour.

Suppositoria Morphinæ.

Morphine Suppositories.

Hydrochlorate of Morphine...	...	6 grains
Oil of Theobroma ...	...	... 174 grains.

Rub the hydrochlorate of morphine with 24 grains of the oil of theobroma in a slightly warmed mortar, and add this to the remainder of the oil of theobroma previously melted at a low temperature; mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains; or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form for a suppository.

Each suppository contains $\frac{1}{2}$ a grain of hydrochlorate of morphine.

They are of a cream colour.

Suppositoria Morphinæ 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.

Mix the hydrochlorate of morphine with the glycerine of starch and soap, and add sufficient starch to form a paste of suitable consistence. Divide the mass into 12 equal parts, each of which is to be made into a conical or other convenient form for a suppository.

Each suppository contains $\frac{1}{2}$ a grain of hydrochlorate of morphine.

Suppositoria Plumbi Composita.

Compound Lead Suppositories.

Acetate of Lead	...	...	...	36 grains
Opium, in powder	...	...	...	12 grains
Oil of Theobroma	...	...	...	132 grains.

Rub the acetate of lead and opium with 42 grains of the oil of theobroma in a slightly warmed mortar, and add them to the remainder of the oil of theobroma previously melted at a low temperature ; mix the whole thoroughly, and pour the mixture while it is fluid into suitable moulds of the capacity of 15 grains; or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form for a suppository.

Each suppository contains 3 grains of acetate of lead and 1 grain of opium.

Syrupi.

Syrups.

Are watery infusions, tinctures, juices, solutions, &c., combined with sugar.

In the preparation as little heat as possible should be used, to prevent the sugar from crystallizing out.

Syrupus.

Syrup.

Synonym :—Simple Syrup.

Refined Sugar...	...	...	...	5 pounds
Distilled Water	...	...	...	2 pints.

Dissolve the sugar in the water with the aid of heat, and add, after cooling, as much distilled water as may be necessary to make the weight of the product $7\frac{1}{2}$ pounds. The specfic gravity should be 1·330.

7 measures of syrup contain 6 of sugar.

Used in the preparation of Conf. Opii; Conf. Scammonii; Mist. Cretæ; Mist. Creasoti; Pil. Cambogiæ Co.; Syr. Aurantii; Syr. Chloral; Syr. Zingiberis; Tinct. Chloroformi et Morphinæ.

Syrupus Aurantii.

Syrup of Orange Peel.

Tincture of Orange Peel...	...	1 fluid ounce
Syrup	...	7 fluid ounces.

Mix. The specific gravity should be about 1·282.

This syrup keeps well; it is not quite bright, and is of a light straw colour.

Dose—1 fluid drachm.

Used in the preparation of Conf. Sulphuris.

Syrupus Aurantii Floris.

Syrup of Orange Flower.

Orange-flower Water...	...	8 fluid ounces
Refined Sugar ...	...	3 pounds
Distilled Water ...	...	16 fluid ounces, or a sufficiency.

Dissolve the sugar in the distilled water by means of heat; strain, and when nearly cold add the orange-flower water, with a sufficient quantity of distilled water, if necessary, to make the product $4\frac{1}{2}$ pounds.

Specific gravity about 1·330.

This syrup is colourless.

If the syrup were added while hot to the orange-flower water the volatile oil would be driven off.

Dose—1 fluid drachm.

Syrupus Chloral.

Syrup of Chloral.

Hydrate of Chloral	80 grains
Distilled Water	$1\frac{1}{2}$ fluid drachm
Syrup	a sufficiency.

Dissolve the hydrate of chloral in the water, and add the syrup until the mixed product measures 1 fluid ounce.

Specific gravity about 1·320.

It contains 10 grains of hydrate of chloral in 1 fluid drachm.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Syrupus Ferri Iodidi.

Syrup of Iodide of Iron.

Iron	1 ounce
Iodine	2 ounces
Refined Sugar	28 ounces
Distilled Water	13 fluid ounces.

Prepare a syrup by dissolving the sugar in 10 ounces of the water with the aid of a little heat. Digest the iodine and the iron in a flask, with the remaining 3 ounces of the water, heating slightly and occasionally shaking until the froth becomes white, thus showing that all the iodine has entered into combination with the iron; add now 2 fluid ounces of the syrup and boil gently for 10 minutes; then filter the liquid, while still hot, into the remainder of the warm syrup, and mix. The product should weigh about 2 pounds 11 ounces.

Specific gravity about 1·385.

It contains 4·3 grains of iodide of iron in 1 fluid drachm.

This is nearly colourless when fresh, but on keeping it undergoes a change and becomes brown, oxyiodide of iron being formed, and iodine set free. This change may be prevented by keeping iron wire in the syrup.

The solution of iodide of iron is ordered to be boiled for 10 minutes with 2 ounces of the syrup to prevent oxidation.

By boiling the syrup and iodide of iron together, a more stable preparation is obtained.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Syrupus Ferri Phosphatis.

Syrup of Phosphate of Iron.

Granulated Sulphate of Iron	...		224 grains
Phosphate of Sodium	...	...	200 grains
Bicarbonate of Sodium	...	...	56 grains
Concentrated Phosphoric Acid		...	$1\frac{1}{4}$ fluid ounce
Refined Sugar	...	...	8 ounces
Distilled Water	...	...	8 fluid ounces.

Dissolve the sulphate of iron in about 4 ounces of boiling water, and the phosphate of sodium in a similar quantity of cold water ; mix the solutions, then add the bicarbonate of sodium dissolved in a little water, and, after careful stirring, transfer the precipitate to a calico filter, and wash it with distilled water till the filtrate ceases to be affected by chloride of barium (*absence of sulphates*). Mix the residue on the filter, in a mortar, with the phosphoric acid. As soon as the precipitate is dissolved, filter the solution, add water and the sugar, and dissolve without heat. The product should measure exactly 12 fluid ounces ; any water which may be necessary, beyond that introduced with the precipitate or with the sugar, being added to form the stated bulk.

Specific gravity about 1·305.

It contains the equivalent of about 1 grain of anhydrous phosphate of iron, $Fe_3 2PO_4$, in 1 fluid drachm.

If heat be applied the syrup darkens in colour, due to the reducing effect of the phosphoric acid with the sugar.

The bicarbonate of sodium is added to neutralise the sulphuric acid set free when the solution of sulphate of iron and phosphate of sodium are mixed together.

If the acid were not neutralized it would dissolve a considerable amount of the phosphate of iron, and so weaken the strength of the syrup.

This syrup is frequently made by dissolving iron in phosphoric acid.

Dose—1 fluid drachm.

Syrupus Ferri Subchloridi.

Syrup of Subchloride of Iron.

Synonym :—Syrup of Ferrous Chloride.

Iron Wire	... 300 grains
Hydrochloric Acid	... 2 fluid ounces
Citric Acid	... 10 grains
Distilled Water	... 10 fluid drachms
Syrup	... a sufficiency.

Mix the hydrochloric acid with one ounce of the water in a flask, add the iron wire, and apply heat gently until action ceases. Remove the flask from the source of heat, add the citric acid, and filter the solution through paper into ten fluid ounces of the syrup, then pass the remainder of the water through the small filter into the syrup. To the product add sufficient syrup to form one pint of the thoroughly mixed fluid. Its specific gravity should be about 1·340.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Syrupus Hemidesmi.

Syrup of Hemidesmus.

Hemidesmus Root, bruised	4 ounces
Refined Sugar	28 ounces
Boiling Distilled Water	1 pint.

Infuse the hemidesmus in the water, in a covered vessel, for 4 hours, and strain. Set it by till the sediment subsides; then decant the clear liquor, add the sugar, and dissolve by the aid of a little heat. The product should weigh 2 pounds 10 ounces.

Specific gravity about 1·335.

It is of a deep brown colour.

Dose—1 fluid drachm.

Syrupus Limonis.

Syrup of Lemons.

Fresh Lemon Peel	2 ounces
Lemon Juice, strained	1 pint
Refined Sugar	$2\frac{1}{4}$ pounds.

Heat the lemon juice to the boiling-point, and, having put it into a covered vessel with the lemon peel, let them stand until they are cold, then filter and dissolve the sugar in the filtered liquid with the aid of heat. The product should weigh $3\frac{1}{2}$ pounds

Specific gravity about 1·340.

It is of a light brown colour.

Dose—1 fluid drachm.

Used in the preparation of Liquor Magnesii Citratis.

Syrupus Mori.

Syrup of Mulberries.

Mulberry Juice	...	...	...	1 pint
Refined Sugar	...	...	...	$2\frac{1}{4}$ pounds
Rectified Spirit	...	...	...	$2\frac{1}{2}$ fluid ounces.

Heat the mulberry juice to the boiling-point, to coagulate albumen, and when it has cooled, filter it. Dissolve the sugar in the filtered liquid with the aid of heat, and add the spirit. The product should weigh 3 pounds 6 ounces.

Specific gravity about 1·330.

It is of a deep lake colour, and is used chiefly as a colouring agent for draughts.

Dose—1 fluid drachm.

Syrupus Papaveris.

Syrup of Poppies.

Poppy Capsules, freed from the seeds, and reduced to No. 20 powder				36 ounces
Rectified Spirit	...	...	...	16 fluid ounces
Refined Sugar	...	...	...	4 pounds
Boiling Distilled Water		...	...	a sufficiency.

Mix the poppy capsules with 4 pints of the water, and infuse for 24 hours, stirring frequently; then pack in a percolator, and adding more of the water allow the liquor slowly to pass until about 2 gallons have been collected or the mass is exhausted. Evaporate the liquor by a water-bath until it is reduced to 3 pints. When quite cold add the spirit (*to coagulate and remove albumen and gummy matters contained in the extract*), let the mixture stand for 12 hours, and filter. Distil off the spirit, the remaining

liquor being evaporated to 2 pints, and then add the sugar. The product should weigh $6\frac{1}{2}$ pounds.

Specific gravity about 1·330.

It is of a deep brown colour.

Dose—1 fluid drachm.

Syrupus Rhei.

Syrup of Rhubarb.

Rhubarb Root, in No. 20 powder Coriander Fruit, in No. 20 powder	of each 2 ounces.
Refined Sugar	24 ounces
Rectified Spirit	8 fluid ounces
Distilled Water	24 fluid ounces.

Mix the rhubarb and coriander; pack them in a percolator; pass the spirit and water, previously mixed, slowly through them; evaporate the liquid that has thus passed until it is reduced to 14 fluid ounces, and in this, after it has been filtered, dissolve the sugar with the aid of heat. The product should weigh nearly $2\frac{1}{2}$ pounds.

Specific gravity about 1·310.

This syrup is of a deep brown colour.

Dose—1 to 4 fluid drachms.

Syrupus Rhœados.

Syrup of Red Poppy.

Fresh Red Poppy petals	13 ounces
Refined Sugar	$2\frac{1}{4}$ pounds
Distilled Water	1 pint, or a sufficiency
Rectified Spirit	$2\frac{1}{2}$ fluid 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 means of heat. When nearly cold, add the spirit, and as much distilled water as may be necessary to make up for loss in the process, so that the product shall weigh 3 pounds 10 ounces.

Specific gravity about 1·330.

If long kept the sugar crystallises out. It is of a deep red colour.

Dose—1 fluid drachm.

Syrupus Rosæ Gallicæ.

Syrup of Red Roses.

Dried Red Rose petals	...	...	2 ounces
Refined Sugar	...	...	30 ounces
Boiling Distilled Water	...	...	1 pint.

Infuse the petals in the water for two hours, squeeze through calico, heat the liquor to the boiling-point (*to coagulate albumen*) and filter. Dissolve the sugar in the liquor by means of heat. The product should weigh 2 pounds 14 ounces.

Specific gravity about 1 335.

It is of a deep red colour.

Dose—1 fluid drachm.

Syrupus Scillæ.

Syrup of Squill.

Vinegar of Squill	...	...	...	1 pint
Refined Sugar	...	...	...	$2\frac{1}{2}$ pounds.

Dissolve with the aid of a little heat.

This syrup is yellow in colour.

Specific gravity about 1·345.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

Syrupus Sennæ.

Syrup of Senna.

Senna, broken small	...	16 ounces
Oil of Coriander ...	...	3 minims
Refined Sugar ...	...	24 ounces
Distilled Water ...	...	5 pints, or a sufficiency
Rectified Spirit ...	...	3 fluid ounces.

Digest the senna in 70 ounces of the water for 24 hours at a temperature of 120° F. (*so as not to extract the albumenoid principles*), press out the liquor and strain it. Digest the marc in 30 ounces of the water for 6 hours at the same temperature; again press out the liquor and strain it. Evaporate the mixed liquors in a water-bath to 10 fluid ounces, and, when cold, add the rectified spirit, previously mixed with oil of coriander. Clarify by filtration (*to free it from albumen and extractive matters*) and wash what remains on the filter with distilled water, until the washings make up the filtrate to 16 fluid ounces. Then add the sugar, and dissolve by heat. The product should weigh 2 pounds 10 ounces.

Specific gravity about 1·310.

This syrup is of a deep red colour.

Dose—1 to 4 fluid drachms.

Syrupus Tolutanus.

Syrup of Tolu.

Balsam of Tolu	...	$1\frac{1}{4}$ ounce
Refined Sugar	...	2 pounds
Distilled Water	...	1 pint, or a sufficiency.

Boil the balsam in the water for $\frac{1}{2}$ an hour in a lightly covered vessel, stirring occasionally. Then remove from the fire and add distilled water, if necessary, so that the

liquid shall measure 16 ounces. Filter the solution when cold (*from resin and cinnamic acid, the latter crystallising out as the liquid cools*), add the sugar, and dissolve with the aid of a steam or water-bath. The product should weigh 3 pounds.

Specific gravity about 1·330.

Dose—1 fluid drachm.

Syrupus Zingiberis.

Syrup of Ginger.

Strong Tincture of Ginger	...	6 fluid drachms
Syrup, sufficient to produce	...	20 fluid ounces.

Mix, with agitation.

If long kept it crystallises. It is of a light straw colour.

Dose—1 fluid drachm.

Easton's Syrup.

(Not official.)

Synonym:—Syrupus Ferri et Quininæ et Strychninæ Phosphatis.

Sulphate of Iron	...	...	...	300 grains
Phosphate of Soda	...	...	...	360 grains

Sulphate of Quinine...	192 grains
Diluted Sulphuric Acid	a sufficiency
Solution of Ammonia	a sufficiency
Strychnine	6 grains
Diluted Phosphoric Acid	14 ounces
White Sugar...	14 ounces.

Dissolve the sulphate of iron in 1 ounce of boiling water, and the phosphate of soda in 2 ounces boiling water. Mix the solutions, and wash the precipitated phosphate of iron till the washings are tasteless. With sufficient diluted sulphuric acid dissolve the sulphate of quinine in 2 ounces of water. Precipitate the quinine with ammonia water, and carefully wash it. Dissolve the phosphate of iron and the quinine thus obtained, as also the strychnine, in the diluted phosphoric acid ; then add the sugar and dissolve the whole, and mix without heat.

1 fluid drachm contains 1 gr. of phosphate of iron, 1 gr. phosphate of quinine, $\frac{1}{32}$ gr. phosphate of strychnine.

Dose—1 drachm.

Tabellæ.

Tablets.

These are circular or oval tablets which have chocolate for their basis.

Tabellæ Nitroglycerini.

Tablets of Nitroglycerine.

Tablets of chocolate, each weighing $2\frac{1}{2}$ grains and containing $\frac{1}{100}$ of a grain of pure nitroglycerine.

Dose—1 or 2 tablets.

Theriaca.

Treacle.

The uncrystallised residue of the refining of sugar.

It is a thick fermentable syrup of a golden colour, very sweet; not crystallising by rest or spontaneous evaporation.

Specific gravity about 1·40.

It is used as a pill excipient to keep the mass soft.

Used in the preparation of Pil. Aloes et Myrrhæ; Pil. Asafœtidæ Co.; Pil. Conii Co.; Pil. Ipecacuanhæ cum Scilla; Pil. Rhei Co.; Pil. Scillæ Co.; Tinct. Chloroformi et Morphinæ.

Thymol ($C_{10}H_{13}HO$).

Thymol.

A stearoptene obtained from the volatile oils of Thymus vulgaris, Monarda punctata, and Carum Ajowan, by saponifying with caustic soda and treating the separated soap with hydrochloric acid, or from a distilled fraction of the oil by exposure at a low temperature. It may be purified by recrystallisation from alcohol.

It occurs in large oblique prismatic crystals having the odour of thyme and a pungent aromatic flavour. They sink in cold water, but on heating the mixture to a temperature of 110° to 125° F. they melt and rise to the surface. Slightly soluble in cold water, freely soluble in alcohol, ether, and solutions of alkalies. The crystals volatilise completely at the temperature of a water-bath. A solution of thymol in half its bulk of glacial acetic acid, warmed with an equal volume of sulphuric acid, assumes a reddish-violet colour.

Dose—$\frac{1}{2}$ to 2 grains.

Tincturæ.

Tinctures.

Tinctures are alcoholic solutions of drugs.

There are 75 official.

45 are prepared by maceration and percolation.

19 by maceration for 7 days.

1 by percolation alone—viz., Tinct. Zingib. Fort.

10 by simply mixing.

Table of Tinctures made with Rectified Spirit.

Aconiti	Cinnamomi	Pyrethri
Arnicæ	Cubebæ	Sumbul
Asafœtidæ	Iodi	Tolutana
Aurantii Recentis	Laricis	Veratri Viridis
Benzoini Co.	Lavandulæ Co.	Zingiberis
Cannabis Indicæ	Myrrhæ	,, Fortior
Capsici	Opii Ammoniata	

Tinctures made with Proof Spirit.

Aloes	Cocci	Lobeliæ
Aurantii	Colchici Seminum	Lupuli
Belladonnæ	Conii	Opii
Buchu	Croci	Quassiæ
Calumbæ	Digitalis	Quininæ
Camphoræ Co.	Ergotæ	,, Am.
Cantharidis	Gallæ	Rhei
Cardamomi Co.	Gelsemii	Sabinæ
Cascarillæ	Gentianæ Co.	Scillæ
Catechu	Hyoscyami	Senegæ
Chiratæ	Jaborandi	Sennæ
Cimicifugæ	Jalapæ	Serpentariæ
Cinchonæ	Krameriæ	Stramonii
,, Co.	Limonis	Valerianæ

Table of Strengths of Tinctures to the Pint.

30 *grains.*	¾ *drachm.*	100 *grains.*
Camphor (Co.)	Lavander (Co.)	Opium (Am.)
160 *grains or* 1 *in* 60.	¼ *ounce or* 1 *in* 80.	½ *ounce or* 1 *in* 40.
Quinine	Cantharides	Aloes
Quinine (Am.)	Cardamoms (Co.)	Iodine
Podophyllum		
¾ *ounce or* 1 *in* 27.	1 *ounce or* 1 *in* 20.	1½ *ounce.*
Capsicum	Arnica	Gentian Co.
Quassia	Belladonna	Opium
	Indian Hemp	
	Saffron	
	Strophanthus	
2 *ounces or* 1 *in* 10.	4 *ounces or* 1 *in* 5.	5 *ounces or* 1 *in* 4.
Orange Peel	Cinchona	Ergot
Benzoin (Co.)	Guaiacum (Am.)	Perchloride of Iron
Chloroform (Co.)	Pellitory	Acetate of Iron
Cinchona (Co.)	Green Hellebore	Jaborandi
Kino		
Rhubarb		
Hamamelis		
Hydrastis		
6 *ounces.*	10 *ounces or* 1 *in* 2.	
Orange Fresh.	Ginger Strong.	

The remaining 37 are 2½ ounces to the pint or 1 in 8.

All those commencing with the letter S are 2½ ounces to the pint and are made by maceration and percolation.

Tinctura Aconiti.

Tincture of Aconite.

Aconite Root from plants cultivated in Britain, in No. 40 powder	$2\frac{1}{2}$ ounces
Rectified Spirit	1 pint.

Macerate the aconite root for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—5 to 15 minims.

(*Strength* 1 *in* 8.)

Tinctura Aloes.

Tincture of Aloes.

Socotrine Aloes, in coarse powder ...	$\frac{1}{2}$ ounce
Extract of Liquorice	$1\frac{1}{2}$ ounce
Proof Spirit	a sufficiency.

Macerate the aloes and extract of liquorice in 15 fluid ounces of the spirit for 7 days, in a closed vessel, with occasional agitation, then filter, and add sufficient proof spirit to make 1 pint.

The extract of liquorice is used to disguise the taste and suspend the aloes.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *in* 40.)

Tinctura Arnicæ.

Tincture of Arnica.

Arnica Rhizome, in No. 40 powder	...	1 ounce
Rectified Spirit...	...	1 pint.

Macerate the arnica for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

This tincture possesses a characteristic odour.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 20.)

Tinctura Asafœtidæ.

Tincture of Asafœtida.

Asafœtida, in small fragments	...	$2\frac{1}{2}$ ounces
Rectified Spirit	...	a sufficiency.

Macerate the asafœtida in 15 fluid ounces of the spirit for 7 days in a closed vessel, with occasional agitation, then filter and add sufficient rectified spirit to make 1 pint.

When mixed with water resin is precipitated.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Aurantii.

Tincture of Orange Peel.

Bitter Orange Peel, cut small and bruised		2 ounces
Proof Spirit	...	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation, then strain, press, and filter, and add sufficient proof spirit to make 1 pint.

This tincture deepens in colour by keeping.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *in* 10.)

Used in the preparation of Mist. Ferri Aromat.; Syr. Aurantii; Tinct. Quininæ.

Tinctura Aurantii Recentis.

Tincture of Fresh Orange Peel.

Bitter Orange Peel Rectified Spirit	...	... of each a sufficiency.

Carefully cut from the orange the coloured part of the rind in thin slices, and macerate 6 ounces of this in 18 fluid ounces of the spirit for a week, with frequent agitation. Then pour off the liquid, press the dregs, mix the liquid products, and filter. Finally, if necessary, add spirit to make 1 pint.

Dose—1 to 2 fluid drachms.

(*Strength* 3 *in* 10.)

Tinctura Belladonnæ.

Tincture of Belladonna.

Belladonna Leaves, in No. 20 powder	...	... 1 ounce
Proof Spirit	... ...	... 1 pint.

Macerate the leaves for 48 hours in 15 fluid 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 1 pint.

60 minims are equivalent to 1 grain of green extract.

Dose—5 to 20 minims.

(*Strength* 1 *in* 20.)

Tinctura Benzoini Composita.

Compound Tincture of Benzoin.

Synonym :—Friar's Balsam, Tincture of Benjamin.

Benzoin, in coarse powder	...	...	...	2 ounces
Prepared Storax	...	...	...	1½ ounce
Balsam of Tolu	...	...	...	½ ounce
Socotrine Aloes	...	...	...	160 grains
Rectified spirit	...	...	...	17 fluid ounces.

Macerate for 7 days in a closed vessel, with occasional agitation, then filter, and add sufficient rectified spirit, if required, to make 1 pint.

Dose—½ to 1 fluid drachm.

(*Strength* 1 *in* 10.)

Tinctura Buchu.

Tincture of Buchu.

Buchu Leaves, in No. 20 powder	...	...	...	2½ ounces
Proof Spirit	...	...	...	1 pint.

Macerate the buchu for 48 hours in 15 fluid 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 1 pint.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Calumbæ.

Tincture of Calumba.

Calumba Root, cut small	...	...	$2\frac{1}{2}$ ounces
Proof Spirit	...	...	1 pint.

Macerate the calumba for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Camphoræ Composita.

Compound Tincture of Camphor.

Synonym:—Paregoric Elixir.

Opium, in powder	...	...	40 grains
Benzoic Acid	...	...	40 grains
Camphor	...	...	30 grains
Oil of Anise	...	...	$\frac{1}{2}$ fluid drachm
Proof Spirit	...	...	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation, then filter, and add sufficient proof spirit to make 1 pint.

It contains the soluble matter of a $\frac{1}{4}$ of a grain of opium in 1 fluid drachm, which is equivalent to about $\frac{1}{8}$ of a grain of extract of opium.

If prescribed with mineral acids the benzoic acid is precipitated.

Dose—15 minims to 1 fluid drachm.

Tinctura Cannabis Indicæ.

Tincture of Indian Hemp.

Extract of Indian Hemp	...	...	1 ounce
Rectified Spirit	...	...	1 pint.

Dissolve the extract of hemp in the spirit.

This tincture is of an intense green colour, 22 minims contain 1 grain of extract; when poured into water the resin is precipitated; it should be prescribed with mucilage.

Dose—5 to 20 minims.

(*Strength* 1 *in* 20.)

Tinctura Cantharidis.

Tincture of Cantharides.

Synonym:—Tinctura Lyttæ.

Cantharides, in coarse powder	...	...	$\frac{1}{4}$ ounce
Proof Spirit	... ...	...	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation; strain, press, filter, and add sufficient proof spirit to make 1 pint.

Dose—5 to 20 minims.

(*Strength* 1 *in* 80.)

Tinctura Capsici.

Tincture of Capsicum.

Capsicum Fruit, bruised	...	...	$\frac{3}{4}$ ounce
Rectified Spirit ...	...	...	1 pint.

Macerate the capsicum for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—10 to 20 minims.

(*Strength* 1 *in* 27.)

Tinctura Cardamomi Composita.

Compound Tincture of Cardamoms.

Cardamom Seeds, bruised	...	...	$\frac{1}{4}$ ounce
Caraway Fruit, bruised ...	...	...	$\frac{1}{4}$ ounce
Raisins, freed from seeds ...	...	...	2 ounces
Cinnamon Bark, bruised ...	...	...	$\frac{1}{2}$ ounce
Cochineal, in powder ...	...	...	55 grains
Proof Spirit ...	...	...	1 pint.

Macerate the solid ingredients for 48 hours in 15 fluid 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 1 pint.

The cardamom seeds are freed from their pericarps, because the latter are useless; the raisins are freed from their seeds, which contain tannin, as no astringent matter is required.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 80.)

Used in the preparation of Dec. Aloes Co.; Mist. Ferri Aromat.; Mist. Sennæ Co.; Tinct. Chloroformi Co.

Tinctura Cascarillæ.

Tincture of Cascarilla.

Cascarilla Bark, in No. 40 powder	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the cascarilla for 48 hours in 15 fluid 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 1 pint.

When prescribed with acids the resin is precipitated.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Catechu.

Tincture of Catechu.

Catechu, in coarse powder	...	$2\frac{1}{2}$ ounces
Cinnamon Bark, bruised...	...	1 ounce
Proof Spirit	...	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation; strain, press, filter, and add sufficient proof spirit to make 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Chiratæ.

Tincture of Chiretta.

Chiretta, cut small and bruised	...	$2\frac{1}{2}$ ounces
Proof Spirit	...	1 pint.

Macerate the chiretta for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

Tinctura Chloroformi Composita.

Compound Tincture of Chloroform.

Chloroform	...	2 fluid ounces
Rectified Spirit	...	8 fluid ounces

Compound Tincture of Cardamoms	...	... 10 fluid ounces.

Mix.

Dose—20 to 60 minims.

(*Strength* 1 *in* 10.)

Tinctura Chloroformi et Morphinæ.

Tincture of Chloroform and Morphine.

Synonym:—Chlorodyne.

Chloroform	...	1 fluid ounce
Ether	...	2 fluid drachms
Rectified Spirit	...	1 fluid ounce
Hydrochlorate of Morphine	...	8 grains
Diluted Hydrocyanic Acid	...	$\frac{1}{2}$ fluid ounce
Oil of Peppermint	...	4 minims
Liquid Extract of Liquorice	...	1 fluid ounce
Treacle	...	1 fluid ounce
Syrup	...	a sufficiency.

Diffuse 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 fluid ounces of syrup, add this to the previously formed solution, mix them thoroughly, add the hydrocyanic acid, and increase the volume to 8 fluid ounces by further addition of syrup.

If dispensed with too small a quantity of water the chloroform will separate.

Dose—5 to 10 minims.

(*Strength* $1\frac{1}{4}$ *minim of chloroform,* $\frac{1}{48}$ *grain of hydrochlorate of morphine, and* $\frac{5}{8}$ *of a minim of diluted hydrocyanic acid in* 10 *minims of the tincture.*)

Tinctura Cimicifugæ.

Tincture of Cimicifuga.

Synonym :—Tincture of Actæa.

Cimicifuga, in No. 40 powder	...	...	$2\frac{1}{2}$ ounces
Proof Spirit	...	...	1 pint.

Macerate the cimicifuga for 48 hours in 15 fluid ounces of the spirit, in a closed vessel, agitating occasionally ; then transfer to a percolator, and when the liquid 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 1 pint.

Dose—15 to 60 minims.

(*Strength* 1 *in* 8.)

Tinctura Cinchonæ.

Tincture of Cinchona.

Red Cinchona Bark, in No. 40 powder	...	...	4 ounces
Proof Spirit...	...	...	1 pint.

Macerate the cinchona bark for 48 hours in 15 fluid 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 1 pint.

Dose— to 2 fluid drachms.

(*Strength* 1 *in* 5.)

Tinctura Cinchonæ Composita.

Compound Tincture of Cinchona.

Synonym :—Huxham's Tincture of Bark.

Red Cinchona Bark, in No. 40 powder	2 ounces
Bitter Orange Peel, cut small, and bruised	1 ounce
Serpentary Root, bruised	½ ounce
Saffron	55 grains
Cochineal, in powder	28 grains
Proof Spirit	1 pint.

Macerate the cinchona bark and the other solid ingredients for 48 hours in 15 fluid 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 1 pint.

Dose—½ to 2 fluid drachms.

(*Strength* 1 *in* 10.)

Tinctura Cinnamomi.

Tincture of Cinnamon.

Cinnamon Bark, in coarse powder	2½ ounces
Rectified Spirit	1 pint.

Macerate the cinnamon for 48 hours in 15 fluid 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 1 pint.

Dose—½ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Cocci.

Tincture of Cochineal.

Cochineal, in powder	2½ ounces
Proof Spirit	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation; strain, press, filter, and add sufficient proof spirit to make 1 pint.

(*Strength* 1 *in* 8.)

Tinctura Colchici Seminum.

Tincture of Colchicum Seeds.

Colchicum Seeds, finely comminuted ...	2½ ounces
Proof Spirit	1 pint.

Macerate the colchicum for 48 hours in 15 fluid 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 1 pint.

The tincture made from the seeds is a better preparation than that made from the corm, and is less liable to create nausea.

Dose—10 to 30 minims.

(*Strength* 1 *in* 8.)

Tinctura Conii.

Tincture of Hemlock.

Hemlock Fruit, finely comminuted ...	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the hemlock fruit for 48 hours in 15 fluid 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 1 pint.

The unripe fruits should be used, as the ripe fruits are almost inert.

Dose—20 to 60 minims.

(*Strength* 1 *in* 8.)

Tinctura Croci.

Tincture of Saffron.

Saffron	1 ounce
Proof Spirit	1 pint.

Macerate the saffron for 48 hours in 15 fluid 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 1 pint.

(*Strength* 1 *in* 20.)

Tinctura Cubebæ.

Tincture of Cubebs.

Cubebs, in powder	$2\frac{1}{2}$ ounces
Rectified Spirit	1 pint.

Macerate the cubebs for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Digitalis.

Tincture of Foxglove.

Foxglove Leaves, in No. 20 powder...	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the foxglove for 48 hours in 15 fluid 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 1 pint.

Dose—10 to 30 minims.

(*Strength* 1 *in* 8.)

Tinctura Ergotæ.

Tincture of Ergot.

Ergot, finely comminuted... ...	5 ounces
Proof Spirit	1 pint.

Macerate the ergot for 48 hours in 15 fluid 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 1 pint.

Dose—5 to 30 minims.

(*Strength* 1 *in* 4.)

Tinctura Ferri Acetatis.

Tincture of Acetate of Iron.

Strong Solution of Acetate of Iron	5 fluid ounces
Acetic Acid...	1 fluid ounce
Rectified Spirit	5 fluid ounces
Distilled Water	9 fluid ounces.

Mix, and then add sufficient distilled water to make 1 pint. Preserve in a stoppered bottle.

Dose—5 to 30 minims.

(*Strength* 1 *in* 4.)

Tinctura Ferri Perchloridi.

Tincture of Perchloride of Iron.

Synonyms :—Tinctura Ferri Sesquichloridi ; Steel Drops.

Strong Solution of Perchloride of Iron	5 fluid ounces
Rectified Spirit	5 fluid ounces
Distilled Water	10 fluid ounces.

Mix, and then add sufficient distilled water to make 1 pint. Preserve in a stoppered bottle.

When long kept, oxychloride of iron is deposited.

Dose—10 to 30 minims.

(*Strength* 1 *in* 4.)

Tinctura Gallæ.

Tincture of Galls.

Galls, in No. 40 powder	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the galls for 48 hours in 15 fluid 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 1 pint.

If long kept, it is of no use as a test for gelatine and the vegetable alkaloids, as its tannic acid becomes converted into gallic acid.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Gelsemii.

Tincture of Gelsemium.

Gelsemium, in No. 40 powder	...	$2\frac{1}{2}$ ounces
Proof Spirit	...	1 pint.

Macerate the gelsemium for 48 hours in 15 fluid 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 spirit to make 1 pint.

Dose—5 to 20 minims.

(*Strength* 1 *in* 8.)

Tinctura Gentianæ Composita.

Compound Tincture of Gentian.

Gentian Root, cut small and bruised		$1\frac{1}{2}$ ounce
Bitter Orange Peel, cut small and bruised	... ...	$\frac{3}{4}$ ounce
Cardamom Seeds, bruised	... ...	$\frac{1}{4}$ ounce
Proof Spirit	...	1 pint.

Macerate the solid ingredients for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* $13\frac{1}{3}$.)

Tinctura Guaiaci Ammoniata.

Ammoniated Tincture of Guaiacum.

Guaiacum Resin, in powder	...	4 ounces
Aromatic Spirit of Ammonia	...	a sufficiency.

Macerate the guaiacum in 15 fluid ounces of the aromatic spirit of ammonia for 7 days in a well-closed vessel, with occasional agitation, and filter ; then add sufficient aromatic spirit of ammonia to make 1 pint.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 5.)

Tinctura Hamamelidis.

Tincture of Hamamelis.

Hamamelis Bark, in No. 20 powder	...	...	...	2 ounces
Proof Spirit	...	...	...	a sufficiency.

Moisten the powder with a suitable quantity of the menstruum, and macerate for 24 hours ; pack in a percolator, and gradually add proof spirit until 1 pint of tincture is obtained.

Dose—5 to 60 minims.

Tinctura Hydrastis.

Tincture of Hydrastis.

Hydrastis Rhizome, in No. 60 powder	...	...	...	2 ounces
Proof Spirit	...	...	...	a sufficiency

Moisten the powder with a suitable quantity of the menstruum, and macerate for 24 hours ; pack in a percolator, and gradually add proof spirit until 1 pint of tincture is obtained.

Dose—20 minims to 1 fluid drachm.

Tinctura Hyoscyami.

Tincture of Henbane.

Henbane leaves, or flowering tops, in No. 20 powder	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the henbane for 48 hours in 15 fluid 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 1 pint.

The biennial leaves only should be used. The tincture made with biennial leaves gives a slight milky mixture when added to water, due to the resin contained in the leaves being precipitated; that made with the annual leaves remains perfectly clear.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Iodi.

Tincture of Iodine.

Iodine	$\frac{1}{2}$ ounce
Iodide of Potassium	$\frac{1}{2}$ ounce
Rectified Spirit	1 pint.

Dissolve the iodine and the iodide of potassium in the spirit.

On the addition of water the iodine is precipitated.

The iodide of potassium is used as a solvent.

Used in the preparation of Vapor Iodi.

Dose—5 to 20 minims.

(*Strength* 1 *part of Iodine in* 40.)

Tinctura Jaborandi.

Tincture of Jaborandi.

Jaborandi, in No. 40 powder	...			5 ounces
Proof Spirit...	...	...	...	1 pint.

Macerate the jaborandi for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 4.)

Tinctura Jalapæ.

Tincture of Jalap.

Jalap, in No. 40 powder	...	...		$2\frac{1}{2}$ ounces
Proof Spirit...	...	...	...	1 pint.

Macerate the jalap for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Kino.

Tincture of Kino.

Kino, in coarse powder	2 ounces
Glycerine	3 fluid ounces
Distilled Water	5 fluid ounces
Rectified Spirit	12 fluid ounces.

Macerate for 7 days in a closed vessel, with occasional agitation, filter and add sufficient rectified spirit to make 1 pint.

This tincture has always given trouble from its gelatinisation on keeping. The addition of glycerine effectually prevents the gelatinisation, and it is helped by reducing the spirit strength of the menstruum.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 10.)

Tinctura Krameriæ.

Tincture of Rhatany.

Rhatany Root, in No. 40 powder ...	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the rhatany root for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Laricis.

Tincture of Larch.

Larch Bark, in No. 40 powder ...	$2\frac{1}{2}$ ounces
Rectified Spirit	1 pint.

Macerate the larch bark for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—20 to 30 minims.

(*Strength* 1 *in* 8.)

Tinctura Lavandulæ Composita.

Compound Tincture of Lavender.

Synonym :—Spiritus Lavandulæ Compositus.

Oil of Lavender	$1\frac{1}{2}$ fluid drachm
Oil of Rosemary	10 minims
Cinnamon Bark, bruised ...	150 grains
Nutmeg, bruised	150 grains
Red Sandal-wood	300 grains
Rectified Spirit	2 pints.

Macerate the cinnamon, nutmeg, and red sandal-wood in the spirit for 7 days, in a closed vessel, with occasional agitation; then strain and press, dissolve the oils in the strained tincture, filter, and add sufficient rectified spirit to make 2 pints.

The English oil of lavender should be used, but either the English or foreign oil of rosemary.

The oils are added last, because otherwise they would be absorbed by the wood during the maceration.

Used in the preparation of Liquor Arsenicalis.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 213.)

Tinctura Limonis.

Tincture of Lemon Peel.

Fresh Lemon Peel, cut small ...	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate for 7 days, in a closed vessel, with occasional agitation; strain, press, and filter, then add sufficient proof spirit to make 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Lobeliæ.

Tincture of Lobelia.

Lobelia, in No. 40 powder... ...	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the lobelia for 48 hours in 15 fluid 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 1 pint.

Dose—10 minims to $\frac{1}{2}$ fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Lobeliæ Ætherea.

Ethereal Tincture of Lobelia.

Lobelia, in coarse powder	2½ ounces
Spirit of Ether	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation; then strain, press, filter, and add sufficient spirit of ether to make 1 pint.

Dose—10 minims to ½ fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Lupuli.

Tincture of Hop.

Hop...	2½ ounces
Proof Spirit	1 pint.

Macerate the hop for 48 hours in 15 fluid 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 1 pint.

Dose—½ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Myrrhæ.

Tincture of Myrrh.

Myrrh, in coarse powder	2½ ounces
Rectified Spirit	1 pint.

Macerate the myrrh for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

This is the only resinous tincture made by maceration and percolation.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Nucis Vomicæ.

Tincture of Nux Vomica.

Extract of Nux Vomica...	...	133 grains
Distilled Water ...	...	...	4 fluid ounces
Rectified Spirit ...	...	...	a sufficiency.

Mix sufficient of the spirit with the water to produce 20 fluid ounces, and dissolve the extract in the mixture.

Dose—10 to 20 minims.

(*Strength*—1 *fluid ounce of this tincture contains* 1 *grain of the alkaloids of nux vomica.*)

Tinctura Opii.

Tincture of Opium.

Synonym:—*Laudanum.*

Opium, in powder	...	...	...	$1\frac{1}{2}$ ounce
Proof Spirit	...	...	...	... 1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation; then strain, press, filter, and add sufficient proof spirit to make 1 pint.

1 grain of opium is contained in $14\frac{2}{3}$ minims of the tincture; 40 minims equal 30 minims of Ext. Opii Liq., or 33 minims of Vinum Opii.

Used in the preparation of Enema Opii and Lin. Opii.

Dose—5 to 40 minims.

(*Strength—It contains the soluble matter of* 33 *grains of the opium, nearly, in* 1 *fluid ounce; or about* 3·3 *grains of morphine in* 1 *fluid ounce; or about* 0·75 *per cent. of morphine, or about* $1\frac{1}{4}$ *per cent. of bimeconate of morphine, besides the other alkaloidal salts of opium.*)

Tinctura Opii Ammoniata.

Ammoniated Tincture of Opium.

Synonym :—Scotch Paregoric.

Opium, in powder	100 grains
Saffron, cut small	180 grains
Benzoic Acid	180 grains
Oil of Anise	1 fluid drachm
Strong Solution of Ammonia ...	4 fluid ounces
Rectified Spirit	16 fluid ounces.

Macerate for 7 days in a well-closed vessel, with occasional agitation; then strain, press, filter, and add sufficient rectified spirit to make 1 pint.

When long kept it deposits.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength—It contains the soluble matter of* 0·62 *grain of the opium in a fluid drachm, or* 5 *grains in a fluid ounce, or* 1 *grain of powdered opium in* 96 *minims.*)

Tinctura Podophylli.

Tincture of Podophyllum.

Resin of Podophyllum	...	...	160 grains
Rectified Spirit	...	...	1 pint.

Dissolve and filter.

It contains 1 grain of the resin in 1 fluid drachm.

About 10 per cent. of the resin remains undissolved. A much better tincture could be made with aromatic spirit of ammonia, as it dissolves nearly the whole of the resin, and may be prescribed with water without fear of precipitation.

Dose—15 minims to 1 fluid drachm.

Tinctura Pyrethri.

Tincture of Pellitory.

Pellitory Root, in No. 40 powder		...	4 ounces
Rectified Spirit	...	...	1 pint.

Macerate the pellitory for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

(*Strength* 1 *in* 5.)

Tinctura Quassiæ.

Tincture of Quassia.

Quassia Wood, in chips	...	...	...	$\frac{3}{4}$ ounce
Proof Spirit	...	...	...	1 pint.

Macerate for 7 days, in a closed vessel, with occasional agitation; then strain, press, filter, and add sufficient proof spirit to make 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 27.)

Tinctura Quininæ.

Tincture of Quinine.

Hydrochlorate of Quinine	...	...	160 grains
Tincture of Orange Peel	...	...	1 pint.

Dissolve the hydrochlorate of quinine in the tincture with the aid of a little heat; then allow the solution to remain for 3 days, in a closed vessel, shaking it occasionally; and afterwards filter.

This tincture was formerly made with sulphate of quinine.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *grain in* 60 *minims.*)

Tinctura Quininæ Ammoniata.

Ammoniated Tincture of Quinine.

Sulphate of Quinine	...	...	160 grains
Solution of Ammonia	...	...	$2\frac{1}{2}$ fluid ounces
Proof Spirit	...	...	$17\frac{1}{2}$ fluid ounces.

Dissolve the sulphate of quinine in the spirit with the aid of a little heat, and add the solution of ammonia.

Heat is unnecessary, as the sulphate of quinine is readily soluble in the mixture of spirit and ammonia.

When mixed with water the quinine soon separates.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *grain in* 60 *minims.*)

Tinctura Rhei.

Tincture of Rhubarb.

Rhubarb Root, in No. 20 powder ...	2 ounces
Cardamom Seeds, bruised	$\frac{1}{4}$ ounce
Coriander Fruit, bruised	$\frac{1}{4}$ ounce
Saffron	$\frac{1}{4}$ ounce
Proof Spirit	1 pint.

Macerate the solid ingredients for 48 hours in 15 fluid 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 1 pint.

When kept for some time it deposits.

Dose—1 to 2 fluid drachms, as a stomachic; 4 to 8 fluid drachms, as a purgative.

(*Strength* 1 *in* 10.)

Tinctura Sabinæ.

Tincture of Savin.

Savin Tops, dried and coarsely powdered	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the savin for 48 hours in 15 fluid 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 1 pint.

Dose—20 minims to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Scillæ.

Tincture of Squill.

Squill, bruised	...	...	...	$2\frac{1}{2}$ ounces
Proof Spirit ...	...	...	...	1 pint.

Macerate the squill for 48 hours in 15 fluid 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 1 pint.

Dose—10 to 30 minims.

(*Strength* 1 *in* 8.)

Tinctura Senegæ.

Tincture of Senega.

Senega Root, in No. 40 powder			...	$2\frac{1}{2}$ ounces
Proof Spirit ...	...	...	...	1 pint.

Macerate the senega for 48 hours in 15 fluid 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 1 pint.

Dose—½ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Sennæ.

Tincture of Senna.

Senna, broken small	...	...	2½ ounces
Raisins, freed from seeds	...	...	2 ounces
Caraway Fruit, bruised	...	...	½ ounce
Coriander Fruit, bruised	...	...	½ ounce
Proof Spirit	...	...	1 pint.

Macerate the solid ingredients for 48 hours in 15 fluid 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 1 pint.

Used in the preparation of Mistura Sennæ Co.

Dose—1 to 4 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Serpentariæ.

Tincture of Serpentary.

Serpentary Rhizome, in No. 40 powder	...	..	2½ ounces
Proof Spirit	...	...	1 pint.

Macerate the serpentary for 48 hours in 15 fluid 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 1 pint.

Dose—$\frac{1}{2}$ to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Stramonii.

Tincture of Stramonium.

Stramonium Seeds, bruised	$2\frac{1}{2}$ ounces
Proof Spirit	1 pint.

Macerate the stramonium for 48 hours in 15 fluid 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 1 pint.

Dose—10 to 30 minims.

(*Strength* 1 *in* 8.)

Tinctura Strophanthi.

Tincture of Strophanthus.

Strophanthus, reduced to No. 30 powder, and dried at 110° F.	1 ounce

Pure Ether[1] / Rectified Spirit	of each	... ...	a sufficiency.

Pack the powder in a percolator, and moisten it with the ether.[1] Macerate for 24 hours, then allow percolation to proceed, continuing the addition of the ether[1] until the fluid passes through colourless. Remove the marc from the percolator, and dry it, gradually heating it to 120° F. Again reduce it to powder, repack in the percolator, and moisten with rectified spirit. Macerate for 48 hours, then pour on successive quantities of the spirit, percolating slowly, until half a pint of tincture is obtained. Dilute with rectified spirit to one pint.

Dose—2 to 10 minims.

Tinctura Sumbul.

Tincture of Sumbul.

Sumbul Root, in No. 40 powder	...	$2\frac{1}{2}$ ounces
Rectified Spirit	...	1 pint.

Macerate the sumbul for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—10 to 30 minims.

(*Strength* 1 *in* 8.)

[1] The strophanthus may be washed with "commercial ether" free from alcohol and water.

Tinctura Tolutana.

Tincture of Tolu.

Balsam of Tolu	...	...	...	2½ ounces
Rectified Spirit	...	...	...	a sufficiency.

Macerate the balsam of tolu in 15 fluid ounces of the spirit, in a closed vessel, with occasional agitation, for 6 hours, or until the balsam is dissolved; then filter, and add sufficient rectified spirit to make 1 pint.

This tincture deepens in colour by age.

Used in the preparation of Trochisci Acidi Tannici; Troch. Morphinæ; Troch. Morphinæ et Ipecac.; and Troch. Opii.

Dose—20 to 40 minims.

(*Strength* 1 *in* 8.)

Tinctura Valerianæ

Tincture of Valerian.

Valerian Rhizome, in No. 40 powder	...	...	2½ ounces
Proof Spirit	...	...	...	1 pint.

Macerate the valerian root for 48 hours in 15 fluid 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 1 pint.

This tincture contains resin, the infusion of Valerian does not.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *in* 8.)

Tinctura Valerianæ Ammoniata.

Ammoniated Tincture of Valerian.

Valerian Rhizome, in No. 40 powder	... ...	$2\frac{1}{2}$ ounces
Aromatic Spirit of Ammonia	...	1 pint.

Macerate for 7 days, in a well-closed vessel, with occasional agitation; then strain, press, filter, and add sufficient aromatic spirit of ammonia to make 1 pint.

Dose—$\frac{1}{2}$ to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Veratri Viridis.

Tincture of Green Hellebore.

Green Hellebore Rhizome, in No. 40 powder		4 ounces
Rectified Spirit	... ...	1 pint.

Macerate the hellebore for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—5 to 20 minims.

(*Strength* 1 *in* 5.)

Tinctura Zingiberis.

Tincture of Ginger.

Ginger, in powder	... ...	$2\frac{1}{2}$ ounces
Rectified Spirit	... ...	1 pint.

Macerate the ginger for 48 hours in 15 fluid 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 rectified spirit to make 1 pint.

Dose—15 minims to 1 fluid drachm.

(*Strength* 1 *in* 8.)

Tinctura Zingiberis Fortior.

Strong Tincture of Ginger.

Synonym:—Essence of Ginger.

Ginger, in fine powder	...	...	10 ounces
Rectified Spirit	...	...	a sufficiency.

Pack the ginger tightly in a percolator, and pour over it carefully half a pint of the spirit. At the expiration of two hours add more spirit, and let it percolate slowly until 1 pint of tincture has been collected.

Used in the preparation of Acid. Sulph. Aromat.; Pil. Scammonii Co.; and Syr. Zingiberis.

Dose—5 to 20 minims.

(*Strength* 1 *in* 2.)

Trochisci.

Lozenges.

There are 13 official lozenges. They weigh 15 or 16 grains each, except bismuth and benzoic acid.

The dose in each case is 1 to 6 lozenges, except Ipecac., which is 1 to 3, and Benzoic Acid, 1 to 5.

Trochisci Acidi Benzoici.

Benzoic Acid Lozenges.

Benzoic Acid	360 grains
Refined Sugar, in powder... ...	25 ounces
Gum Acacia, in powder	1 ounce
Mucilage of Gum Acacia	2 fluid 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 them in a hot-air chamber at a moderate temperature.

Dose—1 to 5 lozenges.

(*Each lozenge contains half a grain of benzoic acid.*)

Trochisci Acidi Tannici.

Tannic Acid Lozenges.

Tannic Acid	360 grains
Tincture of Tolu	$\frac{1}{2}$ fluid ounce
Refined Sugar, in powder ...	25 ounces
Gum Acacia, in powder	1 ounce
Mucilage of Gum Acacia ...	2 fluid ounces
Distilled Water	1 fluid ounce.

Dissolve the tannic acid in the water; add, first, the tincture of tolu, previously mixed with the mucilage, then the gum and the sugar, also previously well mixed. Form the whole into a proper mass; divide it into 720 lozenges, and dry these in a hot-air chamber at a moderate temperature.

Dose—1 to 6 lozenges.

(*Each lozenge contains half a grain of tannic acid.*)

Trochisci Bismuthi.

Bismuth Lozenges.

Subnitrate of Bismuth	...	1440 grains
Carbonate of Magnesium	...	4 ounces
Precipitated Carbonate of Calcium	...	6 ounces
Refined Sugar ...	...	29 ounces
Gum Acacia, in powder	...	1 ounce
Mucilage of Gum Acacia	...	2 fluid 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains 2 grains of subnitrate of bismuth.*)

Trochisci Catechu.

Catechu Lozenges.

Catechu, in powder ...	...	720 grains
Refined Sugar, in powder	...	25 ounces
Gum Acacia, in powder	...	1 ounce
Mucilage of Gum Acacia	...	2 fluid ounces
Distilled Water ...	...	a sufficiency.

Mix the catechu, sugar, and gum, and 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 1 *grain of catechu*).

Trochisci Ferri Redacti.

Reduced Iron Lozenges.

Reduced Iron...	720	grains
Refined Sugar, in powder ...	25	ounces
Gum Acacia, in powder ...	1	ounce
Mucilage of Gum Acacia ...	2	fluid ounces
Distilled Water	1	fluid 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 these in a hot-air chamber at a moderate temperature.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 1 *grain of reduced iron.*)

Trochisci Ipecacuanhæ.

Ipecacuanha Lozenges.

Ipecacuanha, in powder ...	180	grains
Refined Sugar, in powder ...	25	ounces
Gum Acacia, in powder ...	1	ounce
Mucilage of Gum Acacia ...	2	fluid ounces
Distilled Water	1	fluid ounce, or a sufficiency.

Mix the powders, and 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.

Dose—1 to 3 lozenges.

(*Each lozenge contains* $\frac{1}{4}$ *of a grain of ipecacuanha.*)

Trochisci Morphinæ.

Morphine Lozenges.

Hydrochlorate of Morphine	...	20 grains
Tincture of Tolu	...	½ fluid ounce
Refined Sugar, in powder ...	...	24 ounces
Gum Acacia, in powder ...	...	1 ounce
Mucilage of Gum Acacia ...	...	a sufficiency
Distilled Water	...	½ fluid ounce.

Dissolve the hydrochlorate of morphine in the water; add this solution to the tincture of tolu, previously mixed with 2 fluid 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* $\frac{1}{360}$ *of a grain of hydrochlorate of morphine.*)

Trochisci Morphinæ et Ipecacuanhæ.

Morphine and Ipecacuanha Lozenges.

Hydrochlorate of Morphine	...	20 grains
Ipecacuanha, in fine powder	...	60 grains
Tincture of Tolu	...	½ fluid ounce
Refined Sugar, in powder ...	...	24 ounces
Gum Acacia, in powder ...	...	1 ounce
Mucilage of Gum Acacia ...	...	a sufficiency
Distilled Water	...	½ fluid ounce

Dissolve the hydrochlorate of morphine in the water; add this solution to the tincture of tolu, previously mixed with 2 fluid ounces of the mucilage; then add the ipecacuanha, 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* $\frac{1}{36}$ *of a grain of hydrochlorate of morphine, and* $\frac{1}{12}$ *of a grain of ipecacuanha.*)

Trochisci Opii.

Opium Lozenges.

Extract of Opium	72 grains
Tincture of Tolu	$\frac{1}{2}$ fluid ounce
Refined Sugar, in powder ...	16 ounces
Gum Acacia, in powder	2 ounces
Extract of Liquorice	6 ounces
Distilled Water	a sufficiency.

Add the extract of opium, first softened by means of a little water, and the tincture of tolu, to the extract of liquorice heated in a water-bath. When the mixture is reduced to a proper consistence, remove it to a slab, add the sugar and gum previously rubbed together, and mix thoroughly. Divide the mass into 720 lozenges, and dry these in a hot-air chamber at a moderate temperature.

Dose—1 to 6 lozenges.

(*Each lozenge contains* $\frac{1}{10}$ *of a grain of extract of opium, or* $\frac{1}{50}$ *of a grain of morphine.*)

Trochisci Potassii Chloratis.

Chlorate of Potassium Lozenges.

Chlorate of Potassium, in powder ...	3600 grains
Refined Sugar, in powder ...	25 ounces
Gum Acacia, in powder ...	1 ounce
Mucilage of Gum Acacia ...	2 fluid ounces
Distilled Water	1 fluid ounce, or a sufficiency.

Mix the powders and 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 5 *grains of chlorate of potassium.*)

Trochisci Santonini.

Santonin Lozenges.

Santonin	720 grains
Refined Sugar, in powder	25 ounces
Gum Acacia, in powder	1 ounce
Mucilage of Gum Acacia	2 fluid 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 1 *grain of santonin.*)

Trochisci Sodii Bicarbonatis.

Bicarbonate of Sodium Lozenges.

Bicarbonate of Sodium, in powder	3600 grains
Refined Sugar, in powder	25 ounces
Gum Acacia, in powder	1 ounce
Mucilage of Gum Acacia	2 fluid ounces
Distilled Water	1 fluid ounce.

Mix the powders, and 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.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 5 *grains of bicarbonate of sodium.*)

Trochisci Sulphuris.

Sulphur Lozenges.

Precipitated Sulphur	3600 grains
Acid Tartrate of Potassium	720 grains
Refined Sugar, in powder	5760 grains
Gum Acacia, in powder	720 grains
Tincture of Orange Peel	720 minims
Mucilage of Acacia	720 minims.

Mix the tincture of orange with the powders, and add the mucilage to form a suitable mass. Divide into 720 lozenges, and dry these in a hot-air chamber at a moderate temperature.

Dose—1 to 6 lozenges.

(*Each lozenge contains* 5 *grains of sulphur.*)

Unguenta.

Ointments.

There are 45 official ointments. Prepared lard is almost entirely superseded by benzoated lard. Benzoin is used in Ung. Cetacei; 10 are prepared with the paraffin basis; and one with hydrous wool fat.

Unguentum Acidi Borici.

Ointment of Boric Acid.

Synonym:—Ointment of Boracic Acid.

Boric Acid, in fine powder	$2\frac{1}{2}$ ounces
Soft Paraffin	10 ounces
Hard Paraffin	5 ounces.

Melt the hard and soft paraffins 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.

(*Strength* 1 *in* 7.)

Unguentum Acidi Carbolici.

Ointment of Carbolic Acid.

Carbolic Acid	60 grains
Soft Paraffin	720 grains
Hard Paraffin	360 grains.

Melt, and stir together constantly until cold.

(*Strength* 1 *in* 19.)

Unguentum Acidi Salicylici.

Ointment of Salicylic Acid.

Salicylic Acid	60 grains
Soft Paraffin	1080 grains
Hard Paraffin	540 grains.

Melt the hard and soft paraffins together, add the salicylic acid, and stir the whole constantly until cold.

(*Strength* 1 *in* 28.)

Unguentum Aconitinæ.

Ointment of Aconitine.

Aconitine	8 grains
Rectified Spirit	½ fluid drachm
Benzoated Lard	1 ounce.

Dissolve the aconitine in the spirit, add the lard, and mix thoroughly.

(*Strength about* 1 *in* 60.)

Unguentum Antimonii Tartarati.

Ointment of Tartarated Antimony.

Tartarated Antimony, in fine powder ...	$\frac{1}{4}$ ounce
Simple Ointment	1 ounce.

Mix thoroughly.

(*Strength* 1 *in* 5.)

Unguentum Atropinæ.

Ointment of Atropine.

Atropine	8 grains
Rectified Spirit	$\frac{1}{2}$ fluid drachm
Benzoated Lard	1 ounce.

Dissolve the atropine in the spirit, add the lard, and mix thoroughly.

(*Strength* 1 *in* 60.)

Unguentum Belladonnæ.

Ointment of Belladonna.

Alcoholic Extract of Belladonna ...	50 grains
Benzoated Lard	1 ounce.

Mix thoroughly.

(*Strength* 1 *of extract in* 10.)

Unguentum Calaminæ.

Ointment of Calamine.

Synonyms:—Ceratum Calaminæ; Turner's Cerate.

Prepared Calamine	1 ounce
Benzoated Lard	5 ounces.

Mix thoroughly.

(*Strength* 1 *in* 6.)

Unguentum Cantharidis.

Ointment of Cantharides.

Synonym:—Ceratum Cantharidis.

Cantharides Yellow Wax	of each	1 ounce
Olive Oil		6 fluid 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.

(*Strength about* 1 *in* 7.)

Unguentum Cetacei.

Ointment of Spermaceti.

Spermaceti	5 ounces
White Wax	2 ounces
Almond Oil	1 pint
Benzoin, in coarse powder	$\frac{1}{2}$ ounce.

Melt together the spermaceti, wax, and almond oil; add the benzoin, and, frequently stirring the mixture, continue the application of heat for 2 hours; remove from the source of heat, take out the residual benzoin by straining, and stir constantly until quite cold.

This must be stirred until it is quite cold, or the spermaceti and wax crystals will agglomerate together and give the ointment a hard appearance instead of a soft plastic one, which is obtained by stirring until cold. The almond oil is used because it makes a whiter ointment.

(*Strength* 1 *in* $5\frac{1}{2}$.)

Unguentum Chrysarobini.

Ointment of Chrysarobin.

Chrysarobin	20 grains
Benzoated Lard	480 grains.

Melt the lard, add the chrysarobin, and stir them together, maintaining a moderate temperature, so as to promote solution; then remove the heat, and stir until cold.

(*Strength* 1 *in* 25.)

Unguentum Conii.

Ointment of Hemlock.

Juice of Hemlock	2 fluid ounces
Hydrous Wool Fat	$\frac{3}{4}$ ounce
Boric Acid, in fine powder ...	10 grains.

Evaporate the juice to two fluid drachms at a temperature not exceeding 140° F.; add the boric acid and the hydrous wool fat, and mix thoroughly.

Unguentum Creasoti.

Ointment of Creasote.

Creasote	1 fluid drachm
Simple ointment	1 ounce.

Mix thoroughly.

(*Strength* 1 *in* 9.)

Unguentum Elemi.

Ointment of Elemi.

Elemi	$\frac{1}{4}$ ounce
Simple Ointment	1 ounce.

Melt, strain through flannel, and stir constantly until the ointment solidifies.

The resin of the elemi, with the fatty matter of the ointment, forms a clotty mass, from which it is ordered to be strained.

(*Strength* 1 *in* 5.)

Unguentum Eucalypti.

Ointment of Eucalyptus.

Oil of Eucalyptus, by weight	1 ounce
Soft Paraffin } Hard Paraffin } of each	2 ounces.

Melt the hard and soft paraffins together, add the oil, and stir until cold.

(*Strength* 1 *in* 5.)

Unguentum Gallæ.

Ointment of Galls.

Galls, in fine powder	80 grains
Benzoated Lard	1 ounce.

Mix thoroughly.

In making this ointment in large quantities, the lard should be softened by heat. If too much heat be applied, the powder forms into lumps, and the ointment is spoiled.

Used in the preparation of Ung. Gallæ cum Opio.

(*Strength* 1 *in* $6\frac{1}{2}$.)

Unguentum Gallæ cum Opio.

Ointment of Galls and Opium.

Ointment of Galls ...	...	...	1 ounce
Opium, in powder ...	...	...	32 grains.

Mix thoroughly.

(*Strength* 1 *of Opium in* $14\frac{1}{2}$.)

Unguentum Glycerini Plumbi Subacetatis.

Ointment of Glycerine of Subacetate of Lead.

Glycerine of Subacetate of Lead			...	$4\frac{1}{2}$ ounces
Soft Paraffin	...	...	...	18 ounces
Hard Paraffin	...	...	...	6 ounces.

Melt the hard and soft paraffins together; then add the glycerine of subacetate of lead, and stir until the mixture has cooled.

(*Strength* 1 *in* $6\frac{1}{3}$.)

Unguentum Hamamelidis.

Ointment of Hamamelis.

Liquid extract of Hamamelis		...	50 minims
Simple Ointment	...	...	410 grains.

Mix thoroughly.

Unguentum Hydrargyri.

Ointment of Mercury.

Synonym :—Trooper's Ointment.

Mercury Prepared Lard	of each	1 pound
Prepared Suet		1 ounce.

Rub them together until metallic globules cease to be visible.

If the ointment be melted and allowed to settle, and the grease removed by ether, metallic mercury will be left. The mercury is said to combine better if it be first rubbed with a little old ointment of mercury.

The prepared suet is used to prevent the metal subsiding in warm weather. Oleate of mercury is sometimes used in place of ointment of mercury ; it is obtained by dissolving dry precipitated oxide of mercury in oleic acid with the aid of heat.

Used in the preparation of Lin. Hydrargyri ; Ung. Hydrargyri Co. ; and Suppos. Hydrargyri.

(*Strength* 1 *in* 2.)

Unguentum Hydrargyri Ammoniati.

Ointment of Ammoniated Mercury.

Synonym :—White Precipitate Ointment.

Ammoniated Mercury	50 grains
Simple Ointment	450 grains.

Mix thoroughly.

(*Strength* 1 *in* 10.)

Unguentum Hydrargyri Compositum.

Compound Ointment of Mercury.

Synonym :—Scott's Ointment.

Ointment of Mercury	... ...	6 ounces
Yellow Wax, Olive Oil	of each	3 ounces
Camphor	...	$1\frac{1}{2}$ ounce.

Mix the wax and oil by the aid of heat, then incorporate the ointment of mercury, and when the mixture is nearly cold add the camphor in powder ; stir the whole thoroughly together.

The ointment of mercury and camphor are ordered to be added when the mixture is nearly cold ; if they were added before, the mercury would separate in globules, and the camphor volatilise.

(*Strength* 1 *of Mercury in* $4\frac{1}{2}$.)

Unguentum Hydrargyri Iodidi Rubri.

Ointment of Red Iodide of Mercury.

Red Iodide of Mercury, in fine powder	... ...	16 grains
Simple Ointment	...	1 ounce.

Mix thoroughly.

Unguentum Hydrargyri Nitratis.

Ointment of Nitrate of Mercury.

Synonym :—Unguentum Citrinum.

Mercury, by weight	... ...	4 ounces
Nitric Acid ...	... ...	12 fluid ounces
Prepared Lard ...	... ...	15 ounces
Olive Oil	... ...	32 fluid ounces.

Dissolve the mercury in the nitric acid with the aid of a little heat; melt the lard in the oil, by a steam or water bath, in a porcelain vessel capable of holding six times the quantity; and, while the mixture is at about 212° F., add the solution of mercury, also at about the same temperature, mixing them thoroughly. If the mixture do not froth up, increase the heat till this occurs. Keep it stirred until it is cold.

The hot nitric acid forms with the lard a fat isomeric with oleine called elaidine, with evolution of nitrous fumes and carbonic acid gas. Excess of nitric acid is used, otherwise deoxidation of the nitrate of mercury would take place when mixed with the other fat; a porcelain vessel must be used, as metallic substances decompose nitrate of mercury.

The reason why this is recommended to be prepared at a given temperature is to ensure the ointment being of a constant composition.

Used in the preparation of Ung. Hydrargyri Nitratis Dil.

(*Strength* 1 *of Mercury in* 15½.)

Unguentum Hydrargyri Nitratis Dilutum.

Diluted Ointment of Nitrate of Mercury.

Nitrate of Mercury Ointment...	...	1 ounce
Soft Paraffin	...	2 ounces.

Mix.

Citrine ointment cannot be diluted with lard, owing to the liability of the mercuric nitrate to be reduced; with soft paraffin this difficulty is entirely obviated, and a perfectly stable weak ointment obtained.

(*Strength* 1 *in* 3.)

Unguentum Hydrargyri Oxidi Rubri.

Ointment of Red Oxide of Mercury.

Synonyms:—Red Precipitate Ointment; Golden Ointment.

Red Oxide of Mercury, in very fine powder	...	62 grains
Hard Paraffin	...	$\frac{1}{4}$ ounce
Soft Paraffin	...	$\frac{3}{4}$ ounce.

Melt the hard and soft paraffins together, and when the mixture in cooling begins to thicken add the oxide of mercury in a glass or porcelain mortar, and mix the whole thoroughly.

This ointment darkens on keeping, due to the reduction of the oxide of mercury.

(*Strength* 1 *in* 8.)

Unguentum Hydrargyri Subchloridi.

Ointment of Subchloride of Mercury.

Subchloride of Mercury	...	80 grains
Benzoated Lard	...	1 ounce.

Mix thoroughly.

(*Strength* 1 *in* $6\frac{1}{2}$.)

Unguentum Iodi.

Ointment of Iodine.

Iodine	...	32 grains
Iodide of Potassium	...	32 grains
Glycerine	...	1 fluid drachm
Prepared Lard	...	2 ounces.

Rub the iodine and the iodide of potassium well together, with the glycerine, in a glass or porcelain mortar, add the lard gradually, andmix thoroughly.

The glycerine is used to prevent the lard from becoming rancid, and so preserves the ointment.

(*Strength* 1 *in* 31.)

Unguentum Iodoformi.

Ointment of Iodoform.

Iodoform	1 ounce
Benzoated Lard	9 ounces.

Melt the lard at a low temperature, add the iodoform and stir together until dissolved and finally cooled.

(*Strength* 1 *in* 10.)

Unguentum Picis Liquidæ.

Ointment of Tar.

Tar	5 ounces
Yellow Wax	2 ounces.

Melt the wax at a low temperature, add the tar, and stir the mixture briskly while it cools.

(*Strength* 5 *parts in* 7.)

Unguentum Plumbi Acetatis.

Ointment of Acetate of Lead.

Acetate of Lead, in fine powder ...	12 grains
Benzoated Lard	1 ounce.

Mix thoroughly.

(*Strength* 1 *in* $37\frac{1}{2}$.)

Unguentum Plumbi Carbonatis.

Ointment of Carbonate of Lead.

Carbonate of Lead, in fine powder	62 grains
Simple Ointment	1 ounce.

Mix thoroughly.

Unguentum Plumbi Iodidi.

Ointment of Iodide of Lead.

Iodide of Lead, in fine powder ...	62 grains
Simple Ointment	1 ounce.

Mix thoroughly.

(*Strength* 1 *in* 8.)

Unguentum Potassæ Sulphuratæ.

Ointment of Sulphurated Potash.

Sulphurated Potash	30 grains
Hard Paraffin	$\frac{1}{4}$ ounce
Soft Paraffin	$\frac{3}{4}$ ounce.

Triturate the sulphurated potash in a glass or porcelain mortar and gradually add the melted mixture of the hard and soft paraffins, rubbing them together until the ointment is perfectly smooth and free from grittiness.

This ointment should be freshly prepared, on keeping it turns white, due to the sulphurated potash being converted into sulphate of potassium.

(*Strength* 1 *in* $15\frac{1}{2}$.)

Unguentum Potassii Iodidi.

Ointment of Iodide of Potassium.

Iodide of Potassium ...	...	64 grains
Carbonate of Potassium	...	4 grains
Water...	...	1 fluid drachm
Benzoated Lard ...	...	1 ounce.

Dissolve the iodide of potassium and carbonate of potassium in the water, and mix thoroughly with the lard.

If this ointment be made with spermaceti ointment it would turn yellow, owing to a little chlorine, left in the wax during the manufacture, liberating the iodine.

The water is used to dissolve the iodide of potassium and give smoothness to the ointment.

The carbonate of potassium is used to prevent the ointment becoming yellow, which is due to the lard becoming rancid, and so liberating the iodine.

(*Strength about* 1 *in* $8\frac{3}{4}$.)

Unguentum Resinæ.

Ointment of Resin.

Synonyms :— Ceratum Resinæ ; Basilicon Ointment ; Yellow Basilicon.

Resin, in coarse powder...	...	8 ounces
Yellow Wax	...	4 ounces
Simple Ointment ...	...	16 ounces
Almond Oil	...	2 fluid ounces.

Melt at a low temperature, strain the mixture, while hot, through flannel, and stir constantly while it cools.

(*Strength* 1 *in* $3\frac{3}{4}$.)

Unguentum Sabinæ.

Ointment of Savin.

Synonym :—Ceratum Sabinæ.

Fresh Savin Tops, bruised	8 ounces
Yellow Wax	3 ounces
Benzoated Lard	16 ounces.

Melt the lard and the wax together on a water bath, add the savin, and digest for twenty minutes. Then remove the mixture, and express through calico.

(*Strength about* 1 *in* 2.)

Unguentum Simplex.

Simple Ointment.

Synonym :—Diacodium.

White Wax	2 ounces
Benzoated Lard	3 ounces
Almond Oil	3 fluid ounces.

Melt the wax and lard in the oil on a water bath ; then remove the mixture, and stir constantly while it cools.

Used in the preparation of the following Ointments :— Antimonii Tartarati ; Creasoti ; Elemi ; Hyd. Ammoniati ; Hyd. Iodidi Rubri ; Plumbi Carb. ; Plumbi Iodidi ; and Resinæ.

Unguentum Staphisagriæ.

Ointment of Stavesacre.

Stavesacre Seeds	4 ounces
Benzoated Lard	8 ounces.

Crush the seeds and macerate them in the lard kept melted over a water-bath for 2 hours. Strain through calico, and set aside to cool.

This ointment contains about 10 per cent. of oil of stavesacre.

(*Strength about* 1 *in* $2\frac{1}{4}$.)

Unguentum Sulphuris.

Ointment of Sulphur.

Sublimed Sulphur	...	...	...	1 ounce
Benzoated Lard	...	...	...	4 ounces.

Mix throughly.

(*Strength* 1 *in* 5.)

Unguentum Sulphuris Iodidi.

Ointment of Iodide of Sulphur.

Iodide of Sulphur	...	...	...	30 grains
Hard Paraffin	...	...	...	$\frac{1}{4}$ ounce
Soft Paraffin ...	...	...	...	$\frac{3}{4}$ ounce.

Triturate the iodide of sulphur in a glass or porcelain mortar, and gradually add the melted mixture of the hard and soft paraffins, rubbing them together until the ointment is perfectly cold and free from grittiness.

(*Strength* 1 *in* $15\frac{1}{2}$.)

Unguentum Terebinthinæ.

Ointment of Turpentine.

Oil of Turpentine	1 fluid ounce
Resin, in coarse powder	54 grains
Yellow Wax	½ ounce
Prepared Lard	½ ounce.

Melt the ingredients together by the heat of a steam or water-bath. Remove the vessel, and stir the mixture constantly while it cools.

(*Strength* 1 *of the oil in* 2⅛.)

Unguentum Veratrinæ.

Ointment of Veratrine.

Veratrine	8 grains
Hard Paraffin	¼ ounce
Soft Paraffin	¾ ounce
Olive Oil	1 fluid drachm.

Rub the Veratrine and the oil together ; melt the hard and soft paraffins, and when in cooling they begin to thicken, mix the whole thoroughly in a mortar until cold.

(*Strength* 1 *in* 63.)

Unguentum Zinci.

Ointment of Zinc.

Oxide of Zinc...	80 grains
Benzoated Lard	1 ounce.

Add the oxide of zinc to the benzoated lard, previously melted at a low temperature, and stir the mixture constantly while it cools.

(*Strength* 1 *in* 6½.)

Unguentum Zinci Oleati.

Ointment of Oleate of Zinc.

Oleate of Zinc...	1 ounce
Soft Paraffin	1 ounce.

Mix by aid of a little heat, and stir until nearly cold.

(*Strength* 1 *in* 2.)

Vapores.

Inhalations.

Of the 6 Vapores which are now official, the formulæ for those of hydrocyanic acid, chlorine, creasote, and iodine are the same as those in the 1867 Pharmacopœia. That of conine is now made from the juice instead of from the extract, and that of fir-wool oil (Vapor Olei Pini Sylvestris) is new.

Vapor Acidi Hydrocyanici.

Inhalation of Hydrocyanic Acid.

Diluted Hydrocyanic Acid ...	10 to 15 minims
Water, cold	1 fluid drachm.

Mix in a suitable apparatus, and let the vapour that arises be inhaled.

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 vapour that arises be inhaled.

Vapor Coninæ.

Inhalation of Conine.

Juice of Hemlock ...	...	...	½ fluid ounce
Solution of Potash...	...	...	1 fluid drachm
Distilled Water ...	...	...	1 fluid ounce.

Mix. Put 20 minims of the mixture on a sponge, in a suitable apparatus, so that the vapour of hot water passing over it may be inhaled.

Vapor Creasoti.

Inhalation of Creasote.

Creasote ...	...	...	12 minims
Boiling Water ...	...	...	8 fluid ounces.

Mix the creasote and water in an apparatus so arranged that air may be made to pass through the solution, and may afterwards be inhaled.

Vapor Iodi.

Inhalation of Iodine.

Tincture of Iodine	...	...	1 fluid drachm
Water ...	...	...	1 fluid ounce.

Mix in a suitable apparatus which can be gently heated, and let the vapour that arises be inhaled.

Vapor Olei Pini Sylvestris.

Inhalation of Fir-wool Oil.

Fir-wool Oil	...	...	40 minims
Light Carbonate of Magnesium		...	20 grains
Water ...	...	...	a sufficiency.

Rub the fir-wool oil with the carbonate of magnesium, and gradually add sufficient water to produce 1 fluid ounce.

Put 1 fluid drachm of this mixture with half a pint of cold water and half a pint of boiling water into an apparatus so arranged that air may be made to pass through the solution and may afterwards be inhaled.

Vina.

Wines.

There are 11 official Wines.

Vinum Aloes.

Wine of Aloes.

Socotrine Aloes	1½ ounce
Cardamom Seeds, bruised... ...	80 grains
Ginger, in coarse powder... ...	80 grains
Sherry	2 pints.

Macerate for 7 days in a closed vessel, with occasional agitation ; filter the liquor and add sufficient sherry to make 2 pints.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *in* 28⅔.)

Vinum Antimoniale.

Antimonial Wine.

Tartarated Antimony...	40 grains
Sherry...	1 pint.

issolve, and filter if necessary.

Good sherry should be used, as inferior kinds contain substances which cause the precipitation of oxide of antimony. An improvement would be to dissolve the antimony in 10 times its weight of hot water, and add to it the sherry.

Dose—5 minims to 1 fluid drachm.

(*Strength* 2 *grains in* 1 *ounce.*)

Vinum Aurantii.

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.

It contains from 10 to 12 per cent. of alcohol, and is but slightly acid to test-paper.

Used in the preparation of Vin. Ferri Citratis, and Vin. Quininæ.

Vinum Colchici.

Wine of Colchicum.

Colchicum Corm, sliced, dried, and reduced to No. 20 powder	...4 ounces
Sherry	1 pint.

Macerate the colchicum in the wine for 7 days in a closed vessel, with occasional agitation, press and strain through calico ; then add sufficient sherry to make 1 pint.

This wine deposits, when kept, a fungoid growth. It is of the same strength as the tincture of colchicum. It should be strained through calico, as it cannot be readily filtered.

Dose—10 to 30 minims.

(*Strength* 1 *of the corm in* 5.)

Vinum Ferri.

Wine of Iron.

Iron Wire	1 ounce
Sherry	1 pint.

Macerate for 30 days in a closed vessel, the iron being almost, but not quite, wholly immersed in the wine, and the vessel frequently shaken, and the stopper removed; then filter.

It is not the alcohol in the sherry that dissolves the iron, but the acids, such as malic, citric, acetic, tartaric, &c. The black colour is due to the action of the iron on the tannin of the wine. The iron is not wholly immersed in the wine, in order to facilitate oxidation. The stopper is frequently removed to admit a fresh supply of air.

Dose—1 to 4 fluid drachms.

Vinum Ferri Citratis.

Wine of Citrate of Iron.

Citrate of Iron and Ammonium ...	160 grains
Orange Wine	1 pint.

Dissolve, and let the solution remain for 3 days in a closed vessel, shaking it occasionally ; afterwards filter.

Dose—1 to 4 fluid drachms.

(*Strength* 8 *grains in* 1 *ounce.*)

Vinum Ipecacuanhæ.

Wine of Ipecacuanha.

Ipecacuanha, coarsely powdered ...	1 ounce
Acetic Acid	1 fluid ounce
Distilled Water	a sufficiency
Sherry	1 pint.

Macerate the ipecacuanha in the acetic acid for 24 hours. Transfer to a percolator, and pass sufficient distilled water through to produce 1 pint of 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 acetic acid is used to prevent the precipitation of emetine, which it does by forming soluble acetate of emetine.

Dose—5 to 40 minims as an expectorant; 3 to 6 fluid drachms as an emetic.

(*Strength* 1 *in* 20.)

Vinum Opii.

Wine of Opium.

Extract of Opium	1 ounce
Cinnamon Bark, bruised	75 grains
Cloves, bruised	75 grains
Sherry	1 pint

Macerate for 7 days in a closed vessel, with occasional agitation, and filter.

Dose—10 to 40 minims.

(*It contains* 22 *grains of extract of opium, nearly, in* 1 *fluid ounce, which is equal to* 44 *grains of the powder. The wine is* $\frac{1}{4}$ *stronger than the tincture. Each fluid drachm contains about* $\frac{1}{2}$ *a grain of morphine.*)

Vinum Quininæ.

Wine of Quinine.

Sulphate of Quinine	20 grains
Citric Acid	30 grains
Orange Wine	1 pint.

Dissolve, first the citric acid, and then the sulphate of quinine, in the wine; allow the solution to remain 3 days in a closed vessel, shaking it occasionally; and afterwards filter.

The quinine exists in the form of sulphate and citrate.

Dose—$\frac{1}{2}$ to 1 fluid ounce.

(*Strength* 1 *grain in* 1 *ounce.*)

Vinum Rhei.

Wine of Rhubarb.

Rhubarb Root, in coarse powder ...	$1\frac{1}{2}$ ounce
Canella Bark, in coarse powder ...	60 grains
Sherry	1 pint.

Macerate for 7 days in a closed vessel, with occasional agitation, then strain, press, filter, and add sufficient sherry to make 1 pint.

If a little alcohol were used a much better preparation would be obtained, as the sherry is liable to decompose when impregnated with the soluble principles of plants.

Dose—1 to 2 fluid drachms.

(*Strength* 1 *to* $13\frac{1}{3}$.)

Vinum Xericum.

Sherry.

A Spanish wine.

It contains about 17 per cent. of alcohol.

Used in the preparation of the following Wines: Vin. Aloes; Antimoniale; Colchici; Ferri; Ipecacuanhæ; Opii; Rhei.

SPECIFIC GRAVITIES.

Acetum	1·017 to 1·019
„ Cantharidis	1·060
Acidum Aceticum	1·044
„ „ dilutum	1·006
„ „ glaciale	1·058
„ Carbolicum	1·060 to 1·066
„ „ liquefactum	1·064 to 1·067
„ Hydrochloricum	1·160
„ „ dilutum	1·052
„ Hydrocyanicum „	·997
„ Lacticum	1·21
„ „ dilutum	1·040
„ Nitricum	1·42
„ „ dilutum	1·101
„ Nitro-Hydrochloricum dilutum ...	1·07
„ Oleicum	·860 to ·890
„ Phosphoricum concentratum ...	1·5
„ „ dilutum	1·08
„ Sulphuricum	1·843
„ „ Aromaticum	·911
„ „ dilutum	1·094
„ Sulphurosum	1·025
Æther	·735
„ Aceticus	·900
„ Purus	·720
Alcohol Amylicum	·818
„ Ethylicum	·797 to ·800

Amyl Nitris	·877 to ·880
Balsamum Peruvianum	1·137 to 1·150
Bromine	2·97 to 3·14
Cera Flava	·950 to ·970
Chloroformum	1·497
Copaiba	·940 to ·993
Creasotum	1·071
Extractum Opii Liquidum	·985 to ·995
Glycerinum	1·25
Limonis Succus	1·035 to 1·045
Liquor Acidi Chromici	1·185
,, Ammoniæ	·959
,, ,, Fortior	·891
,, Ammonii Acetatis	1·022
,, ,, ,, Fortior	1·073
,, ,, Citratis	1·062
,, ,, ,, Fortior	1·209
,, Antimonii Chloridi	1·47
,, Arsenicalis	1·010
, Arsenici Hydrochloricus	1·010
,, Arsenii et Hydrargyri Iodidi ...	1·016
,, Bismuthi et Ammonii Citratis ...	1·07
,, Calcis Chloridi	1·145
,, ,, Chlorinatæ	1·055
,, ,, Saccharatus	1·052
,, Chlori	1·003
,, Ferri Acetatis	1·031
,, ,, ,, Fortior	1·127
,, ,, Dialysatus	1·047

Liquor Ferri Perchloridi	1·11
„ „ „ Fortior	1·42
„ „ Pernitratis	1·107
„ „ Persulphatis	1·441
„ Hydrargyri Nitratis Acidus ...	2·0
„ Plumbi Subacetatis	1·275
„ Potassæ	1·058
„ Sodæ	1·047
„ „ Chlorinatæ	1·054
„ Sodii Ethylatis	·867
„ Zinci Chloridi	1·460
Mori Succus	1·060
Oleum Eucalypti	·900
„ Pini Sylvestris	·870
„ Santali	·96
„ Sinapis	1·015 to 1·020
Oxymel Scillæ	1·32
Paraffinum Durum	·82 to ·94
„ Molle	·840 to ·870
Phosphorus	1·77
Spiritus Ætheris	·809
„ Ætheris Nitrosi	·840 to ·845
„ Ammoniæ Aromaticus	·886
„ „ Fœtidus	·847
„ Armoraciæ Compositus	·920
„ Camphoræ	·850
„ Chloroformi	·871
„ Rectificatus	·838
„ Tenuior	·920

Syrupus	1·330
„ Aurantii	1·282
„ „ Floris	1·330
„ Chloral	1·320
„ Ferri Iodidi	1·385
„ „ Phosphatis	1·305
„ Hemidesmi	1·335
„ Limonis	1·340
„ Mori	1·330
„ Papaveris	1·330
„ Rhei	1·310
„ Rhæados	1·330
„ Rosæ Gallicæ	1·335
„ Scillæ	1·345
„ Sennæ	1·310
„ Tolu	1·330
Theriaca	1·40

TABLE OF PERCENTAGES OF ACIDS, &c.

Acetum	5·41
Acidum Aceticum	33
,, ,, dilutum	4·27
,, ,, glaciale	99
,, Carbolicum liquefactum	90
,, Hydrobromicum dilutum	10
,, Hydrochloricum	32
,, ,, dilutum	10·58
,, Hydrocyanicum dilutum	2
,, Lacticum	75
,, Nitricum	70
,, ,, dilutum	17·44
,, Phosphoricum Concentratum ...	66·3
,, ,, dilutum	13·8
,, Sulphuricum	98
,, ,, Aromaticum ...	12·5
,, ,, dilutum	13·65
,, Sulphurosum	5
Æther	92
Liquor Acidi Chromici	29·5
Liquor Ammoniæ	10
,, ,, Fortior	32·5
Spiritus Ætheris Nitrosi, from 5 to 7 times its volume of NO.	
,, Rectificatus	84
,, Tenuior, 49 by weight, 57 by volume.	

WEIGHTS AND MEASURES OF THE BRITISH PHARMACOPŒIA.

WEIGHTS.

1 Grain	gr.		
1 Ounce (Avoir.)	oz.	=	437·5 grains
1 Pound	lb. = 16 ounces	=	7000 „

MEASURES OF CAPACITY.

1 Minim	min.		
1 Fluid drachm	fl. drm.	=	60 minims
1 Fluid ounce	fl. oz.	=	8 fluid drachms
1 Pint	O.	=	20 fluid ounces
1 Gallon	C.	=	8 pints

MEASURES OF LENGTH.

1 inch	in.	
12 inches		= 1 foot
36 inches	= 3 feet	= 1 yard

RELATION OF MEASURES TO WEIGHTS.

1 Minim is the measure of		0·9114583 grain of water
1 Fluid Drachm „		54·6875 grains of water
1 Fluid Ounce	„ 1 ounce or	437·5 „
1 Pint	„ 1·25 pound or	8750·0 „
1 Gallon	„ 10 pounds or	70000·0 „

TEST SOLUTIONS FOR VOLUMETRIC ESTIMATIONS.

The processes for volumetric estimations may be performed either with British or with metric weights and measures, and the solutions are so arranged that they will be of the same strength, and the same indications will be obtained in using them, whichever system is employed, without the *necessity* of altering any of the figures by which the quantities of the substances tested or of the test solutions required in the process are expressed.

According to the British system, the quantities of the substances to be tested are expressed in grains by weight, whilst the quantities of the test solutions employed in testing are expressed in grain-measures, the grain-measure being the volume of a grain of distilled water.

According to the metric system, the quantities of the substances to be tested are expressed in grammes by weight, whilst the quantities of the test solutions employed in testing are expressed in cubic centimetres (c.c.),—the cubic centimetre being the volume of a gramme of distilled water.

As the cubic centimetre bears the same relation to the gramme that the grain-measure bears to the grain, the one system may be substituted for the other with no difference in the results, excepting that, by the metric system, all the quantities will be expressed in relation to a weight (the gramme) which is rather more than fifteen (15·432) times as great as the British grain.

THE

DOSES OF THE BRITISH PHARMACOPŒIA, 1885.

Acetanilidum ...	...	3	to	10 gr.
Acetum... ...	1 fl. dr.	,,		1 fl. oz.
,, ipecac.	...	5	,,	40 min.
,, scillæ...	...	15	,,	40 ,,
Acid. acet. dil.	1. fl. dr.	,,		1 fl. oz.
,, arseniosum	...	$\frac{1}{60}$	,,	$\frac{1}{12}$ gr.
,, benzoicum	...	10	,,	15 ,,
,, boricum	...	5	,,	30 ,,
,, carbolicum	...	1	,,	3 ,,
,, ,, liq....		1	,,	4 min.
,, citricum	...	10	,,	30 gr.
,, gallicum	...	2	,,	10 ,,
,, hydrobrom. dil.		15	,,	50 min.
,, hydrochlor. dil.		10	,,	30 ,,
,, hydrocyan. dil.		2	,,	8 ,,
,, lacticum dil. ...		$\frac{1}{2}$	,,	2 fl. dr.
,, nitricum dil. ...		10	,,	30 min.
,, nitro-hydrochlor. dil.		5	,,	20 ,,
,, phosphor. conc.		2	,,	5 ,,
,, ,, dil....		10	,,	30 ,,
,, salicylicum	...	5	,,	30 gr.
,, sulphur. arom....		5	,,	30 min.
,, ,, dil.	...	5	,,	30 ,,
,, sulphurosum	...	$\frac{1}{2}$	,,	1 fl. dr.
,, tannicum	...	2	,,	10 gr.
,, tartaricum	...	10	,,	30 ,,
Æther	...	20	,,	60 min.
,, aceticus	...	20	,,	60 ,,
Aloe Barbadensis	...	2	,,	6 gr.
,, Socotrina	...	2	,,	6 ,,
Aloin	...	$\frac{1}{2}$	,,	2 ,,
Alumen ...	...	10	,,	20 ,,
Ammoniacum...	...	10	,,	20 ,,
Ammon. benzoas	...	10	,,	20 ,,
,, bromidum	...	2	,,	20 ,,
,, carbonas	...	3	,,	10 ,,
Ammon. chloridum ...		5	to	20 gr.
,, phosphas	...	5	,,	20 ,,
Amyl nitris		$\frac{1}{2}$	,,	1 min.
,, ,, by inhalation vapour of		2	,,	5 ,,
Antim. oxidum	...	1	,,	4 gr.
,, sulphuratum...		1	,,	5 ,,
,, tartaratum (as diaphoretic)...		$\frac{1}{16}$	,,	$\frac{1}{6}$,,
(as emetic)		1	,,	2 ,,
Aqua camphoræ	...	1	,,	2 fl. oz.
,, chloroformi	...	$\frac{1}{2}$	,,	2 ,,
,, laurocerasi	...	$\frac{1}{2}$	,,	2 fl. dr.
Argenti nitras	...	$\frac{1}{6}$	,,	$\frac{1}{3}$ gr.
,, oxidum	...	$\frac{1}{2}$	,,	2 ,,
Arsenii iodidum	...			$\frac{1}{30}$,,
Asafœtida ...	...	5	,,	20 ,,
Balsamum Peruv.	...	10	,,	15 min.
,, tolut.	...	10	,,	20 gr.
Beberinæ sulphas	...	1	,,	10 ,,
Bismuthi carbonas	...	5	,,	20 ,,
,, citras	...	2	,,	5 ,,
,, et ammon. cit.		2	,,	5 ,,
,, oxidum	...	5	,,	15 ,,
,, subnitras	...	5	,,	20 ,,
Borax	...	5	,,	40 ,,
Butyl-chloral hydras		5	,,	15 ,,
Caffeina ...	...	1	,,	5 ,,
Caffeinæ citras	...	2	,,	10 ,,
Calcii carb. præcip.	...	10	,,	60 ,,
,, chloridum	...	3	,,	10 ,,
,, hypophosphis...		5	,,	10 ,,
,, phosphas	...	10	,,	20 ,,
Calumbæ radix	...	5	,,	20 ,,
Calx sulphurata	...	$\frac{1}{10}$	,,	1 ,,
Cambogia ...	...	1	,,	4 ,,

Camphora	1	to 10	gr.
Carbo animal. purif. ...	20	,, 60	,,
,, ligni	20	,, 60	,,
Catechu	10	,, 30	,,
Cerevisiæ fermentum	½	,, 1	oz.
Cerii oxalas	1	,, 2	gr.
Chloral hydras ...	5	,, 30	,,
Chloroformum ...	3	,, 10	min.
Chrysarobinum ...	1/6	,, ½	gr.
Cinchonidinæ sulphas	1	,, 10	,,
Cinchoninæ sulphas ...	1	,, 10	,,
Coca	½	,, 2	dr.
Cocainæ hydrochlor....	1/5	,, 1	gr.
Codeina	¼	,, 2	,,
Colchici cormus ...	2	,, 8	,,
Colocynthidis pulpa ...	2	,, 8	,,
Confectio opii... ...	5	,, 20	,,
,, piperis ...	60	,, 120	,,
,, scammonii	10	,, 30	,,
,, sennæ ...	60	,, 120	,,
,, sulphuris ...	60	,, 120	,,
,, terebinth. ...	60	,, 120	,,
Conii folia	2	,, 8	,,
Copaiba	½	,, 1	fl.dr.
Creasotum	1	,, 3	drops
Creta præparata ...	10	,, 60	gr.
Cubeba	30	,, 120	,,
Cupri sulphas (as astringent)	¼	,, 2	,,
Cupri sulphas (as emetic)	5	,, 10	,,
Cusso	¼	,, ½	oz.
Decoct. aloes comp. ...	½	,, 2	fl.oz.
,, cetrariæ ...	1	,, 4	,,
,, cinchonæ ...	1	,, 2	,,
,, granati radicis	2	,, 4	,,
,, hæmatoxyli ...	1	,, 2	,,
,, hordei ...	1	,, 4	,,
,, pareiræ ...	1	,, 2	,,
,, sarsæ	2	,, 10	,,
,, ,, comp. ...	2	,, 10	,,
,, scoparii ...	2	,, 4	,,
,, taraxaci ...	2	,, 4	,,
Digitalis folia... ...	½	,, 1½	gr.
Elaterinum	1/40	,, 1/10	,,
Elaterium	1/16	,, ½	,,
Ergota	20	,, 30	,,
Ergotinum	2	to 5	gr.
Essentia anisi ...	10	,, 20	min.
,, menthæ pip.	10	,, 20	,,
Eucalypti gummi ...	2	,, 10	gr.
Ext. aconiti	¼	,, 1	,,
,, aloes Barb. ...	2	,, 6	,,
,, ,, Soc. . .	2	,, 6	,,
,, anthemidis ...	2	,, 10	,,
,, belæ liq.	1	,, 2	fl.dr.
,, belladonnæ ...	¼	,, 1	gr.
,, ,, alcohol.	1/10	,, ¼	,,
,, calumbæ	2	,, 10	,,
,, cannabis Ind. ...	¼	,, 1	,,
,, cascaræ sag. ...	2	,, 8	,,
,, ,, liq. ...	½	,, 2	fl.dr.
,, cimicif. liq. ...	3	,, 30	min.
,, cinchonæ liq. ...	5	,, 10	,,
,, cocæ liq.	½	,, 2	fl.dr.
,, colchici	½	,, 2	gr.
,, ,, acet. ...	½	,, 2	,,
,, colocynth. comp.	3	,, 10	,,
,, conii	2	,, 6	,,
,, ergotæ liq. ...	10	,, 30	min.
,, euonymi sicc. ...	1	,, 4	gr.
,, filicis liq.... ...	15	,, 30	min.
,, gelsemii alcohol	½	,, 2	gr.
,, gentianæ	2	,, 10	,,
,, glycyrrhizæ ...	5	gr. to 1	dr.
,, ,, liq. ...		1	fl.dr.
,, hæmatoxyli ...	10	,, 30	gr.
,, hamamelidis liq.	2	,, 5	min.
,, hydrastis liq. ...	5	,, 30	,,
,, hyoscyami ...	5	,, 10	gr.
,, jaborandi ...	2	,, 10	,,
,, jalapæ	5	,, 15	,,
,, krameriæ ...	5	,, 20	,,
,, lactucæ	5	,, 15	,,
,, lupuli.	5	,, 15	,,
,, nucis vom. ...	¼	,, 1	,,
,, opii	½	,, 2	,,
,, ,, liq.	10	,, 40	min.
,, papaveris ...	2	,, 5	gr.
,, pareiræ	10	,, 30	,,
,, ,, liq. ...	½	,, 2	fl.dr.
,, physostig. ...	1/16	,, ¼	gr.
,, quassiæ	3	,, 5	,,
,, rhamni frang. ...	15	,, 60	,,

Ext. rhamni frang. liq.	1	to	4 fl. dr.	Inf. rhei	1	to	2 fl. oz.
,, rhei	5	,,	15 gr.	,, rosæ acid. ...	1	,,	2 ,,
,, sarsæ liq.... ...	2	,,	4 fl. dr.	,, senegæ	1	,,	2 ,,
,, stramonii ...	$\frac{1}{4}$	,,	$\frac{1}{2}$ gr.	,, sennæ	1	,,	2 ,,
,, taraxaci	5	,,	30 ,,	,, serpentariæ ...	1	,,	2 ,,
,, ,, liq. ...	$\frac{1}{4}$	,,	2 fl. dr.	,, uvæ ursi	1	,,	2 ,,
Fel bovinum purif. ...	5	,,	10 gr.	,, valerianæ ...	1	,,	2 ,,
Ferri arsenias	$\frac{1}{10}$	,,	$\frac{1}{2}$,,	Inj. apomorph. hypoder. by subcutaneous injection	2	,,	8 min.
,, carb. sacch. ...	5	,,	30 ,,	,, ergotini ,, ...	3	,,	10 ,,
,, et ammon. cit. ...	5	,,	10 ,,	,, morphinæ ,, ...	1	,,	5 ,,
,, et quininæ cit. ...	5	,,	10 ,,	Iodoformum	$\frac{1}{2}$	,,	3 gr.
,, peroxidum hyd.	5	,,	30 ,,	Ipecacuanha (as expectorant) ...	$\frac{1}{2}$	,,	2 ,,
,, phosphas ...	5	,,	10 ,,	,, (as emetic) ...	15	,,	30 ,,
,, sulphas	1	,,	5 ,,	Jaborandi	5	,,	60 ,,
,, ,, exsic. ...	$\frac{1}{2}$	,,	3 ,,	Jalapa	10	,,	30 ,,
,, ,, gran. ...	1	,,	5 ,,	Jalapa resina	2	,,	5 ,,
Ferrum redactum ...	1	,,	5 ,,	Kamala ...	30 gr.	,,	$\frac{1}{4}$ oz.
,, tartaratum ...	5	,,	10 ,,	Kino	10	,,	30 gr.
Gelsemium	5	,,	30 ,,	Liq. ammon. acetatis	2	,,	6 fl. dr.
Glycerinum	1	,,	2 dr.	,, ammon. acetatis fort.	25	,,	75 min.
Guaiaci resina ...	10	,,	30 gr.	,, ammon. citratis	2	,,	6 fl. dr.
Homatropinæ hydrobrom.	$\frac{1}{80}$	,,	$\frac{1}{20}$,,	,, ammon. citratis fort.	$\frac{1}{2}$	,,	$1\frac{1}{2}$,,
Hydrarg. iodidum rub.	$\frac{1}{32}$	,,	$\frac{1}{8}$,,	,, arsenicalis ...	2	,,	8 min.
,, perchloridum	$\frac{1}{10}$	,,	$\frac{1}{8}$,,	,, arsenici hydrochlor.	2	,,	8 ,,
,, subchloridum	$\frac{1}{2}$	,,	5 ,,	,, arsenici et hyd. iodidi	10	,,	30 ,,
,, cum creta ...	3	,,	8 ,,	,, atropinæ sulphatis	1	,,	4 ,,
Inf. anthemidis ...	1	,,	4 fl. oz.	,, bismuthi et ammon. cit.	$\frac{1}{2}$	,,	1 fl. dr.
,, aurantii	1	,,	2 ,,	,, calcii chloridi ...	15	,,	50 min.
,, ,, comp. ...	1	,,	2 ,,	,, calcis	1	,,	4 fl. oz.
,, buchu	1	,,	4 ,,	,, ,, saccharatus	15	,,	60 min
,, calumbæ	1	,,	2 ,,	,, chlori	10	,,	20 ,,
,, caryophylli ...	1	,,	4 ,,	,, cocainæ hydrochlor.	2	,,	10 ,,
,, cascarillæ ...	1	,,	2 ,,	,, ferri acetatis ...	5	,,	30 ,,
,, catechu	1	,,	2 ,,	,, ,, ,, fort.	1	,,	8 ,,
,, chiratæ	1	,,	2 ,,	,, ,, dialysatus ...	10	,,	30 ,,
,, cinchonæ acid. ...	1	,,	2 ,,	,, ,, perchloridi...	10	,,	30 ,,
,, cuspariæ	1	,,	2 ,,	,, ,, pernitratis ...	10	,,	40 ,,
,, cusso	4	,,	8 ,,	,, hyd. perchloridi	$\frac{1}{2}$	,,	2 fl. dr.
,, digitalis	2	,,	4 fl. dr.				
,, ergotæ	1	,,	2 fl. oz.				
,, gentianæ comp. ...	1	,,	2 ,,				
,, jaborandi	1	,,	2 ,,				
,, krameriæ	1	,,	2 ,,				
,, lupuli	1	,,	2 ,,				
,, maticæ	1	,,	4 ,,				
,, quassiæ	1	,,	2 ,,				

Liq. lithiæ effervescens	5	to	10	fl. oz.
,, magnesii carb. ...	1	,,	2	,,
,, ,, cit. ...	5	,,	10	,,
,, morphinæ acet. ...	10	,,	60	min.
,, ,, bimecon. ...	5	,,	40	,,
,, ,, hydrochlor.	10	,,	60	,,
,, ,, sulph. ...	10	,,	60	,,
,, potassæ	15	,,	60	,,
,, potassii permangan.	2	,,	4	fl. dr.
,, sodæ chlorinatæ ...	10	,,	20	min.
,, sodii arseniatis ...	5	,,	10	,,
,, strychninæ hydrochlor.	5	,,	10	,,
,, trinitrinæ ...	½	,,	2	,,
Lithii carbonas ...	3	,,	6	gr.
,, citras	5	,,	10	,,
Lupulinum	2	,,	5	,,
Magnesia levis ...	10	,,	60	,,
,, ponderosa ...	10	,,	60	,,
Magnesii carb. levis ...	10	,,	60	,,
,, ,, pond.	10	,,	60	,,
,, sulphas ...	60	gr.	to ½	oz.
,, sulph. effer.	¼	,,	1	oz.
Manna	60	gr.	to 1	oz.
Menthol	½	,,	2	gr.
Mist. ammoniaci ...	½	,,	1	fl. oz.
,, amygdalæ ...	1	,,	2	,,
,, creasoti	1	,,	2	,,
,, cretæ	1	,,	2	,,
,, ferri aromat. ...	1	,,	2	,,
,, ,, comp. ...	1	,,	2	,,
,, guaiaci	½	,,	2	,,
,, olei ricini ...	½	,,	2	,,
,, scammonii ...	1	,,	3	,,
,, sennæ comp. ...	1	,,	1½	,,
,, spiritus vini gall.	1	,,	2	,,
Morphinæ acetas ...	⅛	,,	½	gr.
,, hydrochlor.	⅛	,,	½	,,
,, sulphas ...	⅛	,,	½	,,
Moschus	5	,,	10	,,
Oleo-resina cubebæ ...	5	,,	30	min.
Oleum anethi	1	,,	4	,,
,, anisi	1	,,	4	,,
,, anthemidis ...	1	,,	4	,,
,, cajuputi ...	1	,,	4	,,
,, carui	1	,,	4	,,
Oleum caryophylli ...	1	to	4	min.
,, cinnamomi ...	1	,,	4	,,
,, copaibæ ...	5	,,	20	,,
,, coriandri ...	1	,,	4	,,
,, crotonis ...	⅓	,,	1	,,
,, cubebæ ...	5	,,	20	,,
,, eucalypti ...	1	,,	4	,,
,, juniperi ...	1	,,	4	,,
,, lavandulæ ...	1	,,	4	,,
,, limonis ...	1	,,	4	,,
,, menthæ pip. ...	1	,,	4	,,
,, ,, vir. ...	1	,,	4	,,
,, morrhuæ ...	1	,,	8	fl. dr.
,, myristicæ ...	1	,,	4	min.
,, phosphoratum	5	,,	10	,,
,, pimentæ ...	1	,,	4	,,
,, ricini... ...	1	,,	8	fl. dr.
,, rosmarini ...	1	,,	4	min.
,, rutæ	1	,,	4	,,
,, sabinæ... ...	1	,,	4	,,
,, santali... ...	10	,,	30	,,
,, terebinthinæ	10	m. ,,	4	fl. dr.
Opium	½	,,	3	gr.
Oxymel	1	,,	2	fl. dr
,, scillæ	½	,,	1	,,
Paraldehydum ...	½	,,	1½	,,
Pepsin	2	,,	5	gr.
Phenacetinum... ...	5	,,	10	,,
Phenazonum	3	,,	20	,,
Pysostigmatis semen	1	,,	4	,,
Picrotoxinum	1/100	,,	1/30	,,
Pilocarpinæ nitras ...	1/20	,,	½	,,
Pil. aloes Barb. ...	5	,,	10	,,
,, ,, et asafœt. ...	5	,,	10	,,
,, ,, et ferri ...	5	,,	10	,,
,, ,, et myrrhæ...	5	,,	10	,,
,, ,, Soc.	5	,,	10	,,
,, asafœt. comp. ...	5	,,	10	,,
,, cambogiæ comp.	5	,,	10	,,
,, colocynth. comp.	5	,,	10	,,
,, ,, et hyos.	5	,,	10	,,
,, conii comp. ...	5	,,	10	,,
,, ferri	1	,,	4	pills.
,, ,, carb. ...	5	,,	20	gr.
,, ,, iodidi ...	3	,,	8	,,
,, hydrargyri ...	3	,,	8	,,
,, hyd. subchlor. comp.	5	,,	10	,,

Pil. ipecac. cum scilla	5	to 10	gr.
,, phosphori... ...	2	,, 4	,,
,, plumbi cum opio	3	,, 5	,,
,, rhei comp. ...	5	,, 10	,,
,, saponis comp. ...	3	,, 5	,,
,, scammonii comp.	5	,, 15	,,
,, scillæ comp. ...	5	,, 10	,,
Plumbi acetas... ...	1	,, 4	,,
Podophylli resina ...	¼	,, 1	,,
Potassii acetas ...	10	,, 60	,,
,, bicarb. ...	10	,, 40	,,
,, bromidum ...	5	,, 30	,,
,, carbonas ...	10	,, 30	,,
,, chloras ...	10	,, 30	,,
,, citras ...	20	,, 60	,,
,, iodidum ...	2	,, 20	,,
,, nitras ...	10	,, 30	,,
,, permangan....	1	,, 5	,,
,, sulphas ...	15	,, 60	,,
,, tartras ...	60 gr.	to ½	oz.
,, ,, acida	20	,, 60	gr.
Pulv. antimonialis ...	3	,, 5	,,
,, catechu comp.	20	,, 40	,,
,, cinnam. comp.	3	,, 10	,,
,, cretæ aromat. ...	10	,, 60	,,
,, ,, cum opio	10	,, 40	,,
,, elaterini comp.	½	,, 5	,,
,, glycyrrhizæ comp.	30	,, 60	,,
,, ipecac. comp. ...	5	,, 15	,,
,, jalapæ comp. ...	20	,, 60	,,
,, kino comp. ...	5	,, 20	,,
,, opii comp. ...	2	,, 5	,,
,, rhei comp. ...	20	,, 60	,,
,, scammonii comp.	10	,, 20	,,
,, tragacanth. comp.	20	,, 60	,,
Quininæ hydrochlor....	1	,, 10	,,
,, sulphas ...	1	,, 10	,,
Rhei radix	5	,, 20	,,
Sabinæ cacumina ...	4	,, 10	,,
Salicinum	3	,, 20	,,
Santonica	10	,, 60	,,
Santoninum	2	,, 6	,,
Scammoniæ resina ...	3	,, 8	,,
Scammonium	5	,, 10	,,
Scilla	1	,, 3	,,
Soda tartarata ...	¼	,, ½	oz.

Sodii arsenias ...	1/16	to ⅛	gr.
,, benzoas	10	,, 30	,,
,, bicarbonas ...	10	,, 60	,,
,, bromidum ...	10	,, 30	,,
,, carbonas ...	5	,, 30	,,
,, ,, exsic.	3	,, 10	,,
,, citro-tart. effer.	60 gr.	to ¼	oz.
,, hypophosphis ...	5	,, 10	gr.
,, iodidum	3	,, 10	,,
,, nitris	2	,, 5	,,
,, phosphas ...	¼	,, 1	oz.
,, ,, effer. ...	¼	,, ½	,,
,, salicylas ...	10	,, 30	gr.
,, sulphas	¼	,, 1	oz.
,, ,, effer. ...	¼	,, ½	,,
,, sulphis	5	,, 20	gr.
,, sulphocarbolas...	10	,, 15	,,
,, valerianas ...	1	,, 5	,,
Sp. ætheris	30	,, 90	min.
,, ,, comp.	30 m.	,, 2	fl. dr.
,, ,, nit. ...	½	,, 2	,,
,, ammon. aromat. ...	½	,, 1	,,
,, ,, fœtid. ...	½	,, 1	,,
,, armoraciæ comp....	1	,, 2	,,
,, cajuputi	½	,, 1	,,
,, camphoræ... ...	10	,, 30	min.
,, chloroformi ...	20	,, 60	,,
,, cinnamomi ...	½	,, 1	fl. dr.
,, juniperi	½	,, 1	,,
,, lavandulæ... ...	½	,, 1	,,
,, menthæ pip. ...	½	,, 1	,,
,, myristici	½	,, 1	,,
,, rosmarini	½	,, 1	,,
Strychnina	1/30	,, 1/12	gr.
Succus belladonnæ ...	5	,, 15	min.
,, conii	½	,, 1	fl. dr.
,, hyoscyami ...	½	,, 1	,,
,, scoparii ...	1	,, 2	,,
,, taraxaci ...	1	,, 2	,,
Sulphonal	15	,, 40	gr.
Sulphur præcip. ...	20	,, 60	,,
,, sublimat. ...	20	,, 60	,,
Syr. aurantii			1 fl. dr.
,, ,, floris ...			1 ,,
,, chloral	½	,, 2	,,
,, ferri iodidi ...	½	,, 1	,,
,, ,, phosphatis			1 ,,

Syr. ferri subchlor. ... ½ to 1 fl. dr.
„ hemidesmi ... 1 „
„ limonis ... ... 1 „
„ mori ... ... 1 „
„ papaveris ... 1 „
„ rhei ... ... 1 „ 4 „
„ rhœados ... ... 1 „
„ rosæ gallicæ ... 1 „
„ scillæ ... ... ½ „ 1 „
„ sennæ ... ... 1 „ 4 „
„ tolutanus ... 1 „
„ zingiberis ... 1 „
Tabellæ nitroglycerini 1 or 2 tab.
Terebinthina Canadensis ... ... 20 to 30 gr.
Thymol... ... ... ½ „ 2 „
Tr. aconiti ... ... 5 „ 15 min.
„ aloes ... ... 1 „ 2 fl. dr.
„ arnicæ ... ... ½ „ 1 „
„ asafœtidæ .. ... ½ „ 1 „
„ aurantii ... ... 1 „ 2 „
„ „ recent. ... 1 „ 2 „
„ belladonnæ ... 5 „ 20 min.
„ benzoini comp. ... ½ „ 1 fl. dr.
„ buchu ... ... 1 „ 2 „
„ calumbæ ... ... ½ „ 2 „
„ camphoræ comp. 15 min. to 1 „
„ cannabis Ind. ... 5 „ 20 min.
„ cantharidis ... 5 „ 20 „
„ capsici ... ... 10 „ 20 „
„ cardamomi comp.. ½ „ 2 fl. dr.
„ cascarillæ ... ½ „ 2 „
„ catechu ... ... ½ „ 2 „
„ chiratæ ... ... ½ „ 2 „
„ chloroformi comp. 20 „ 60 min.
„ „ et morph. 5 „ 10 „
„ cimicifugæ ... 15 „ 60 „
„ cinchonæ... ... ½ „ 2 fl. dr.
„ „ comp.... ½ „ 2 „
„ cinnamomi ... ½ „ 2 „
„ colchici sem. ... 10 „ 30 min.
„ conii ... ... 20 „ 60 „
„ cubebæ ... ... ½ „ 2 fl. dr.
„ digitalis ... ... 10 „ 30 min.
„ ergotæ ... ... 5 „ 30 „
„ ferri acet. ... 5 „ 30 „
„ „ perchlor. ... 10 „ 30 „

Tr. gallæ ... ... ½ to 2 fl. dr.
„ gelsemii ... ... 5 „ 20 min.
„ gentianæ comp. ... ½ „ 2 fl. dr.
„ guaiaci ammon. ... ½ „ 1 „
„ hamamelidis ... 5 „ 60 min.
„ hydrastis ... 20 min. „ 1 fl. dr.
„ hyoscyami ... ½ „ 1 „
„ iodi ... ... 5 „ 20 min.
„ jaborandi ... ½ „ 1 fl. dr.
„ jalapæ ... ... ½ „ 2 „
„ kino ... ... ½ „ 2 „
„ krameriæ ... ... ½ „ 2 „
„ laricis ... ... 20 „ 30 min.
„ lavandulæ comp. ½ „ 2 fl. dr.
„ limonis ... ... ½ „ 2 „
„ lobeliæ ... 10 m. „ ½ „
„ „ æther. 10 m. „ ½ „
„ lupuli ... ... ½ „ 2 „
„ myrrhæ ... ... ½ „ 1 „
„ nucis vom. ... 10 „ 20 min.
„ opii ... ... 5 „ 40 „
„ „ ammon. ... ½ „ 1 fl. dr.
„ podophylli 15 m. „ 1 „
„ quassiæ ... ... ½ „ 2 „
„ quininæ ... ... ½ „ 2 „
„ „ ammon.... ½ „ 2 „
„ rhei (as stomachic) 1 „ 2 „
„ „ (as purgative) 4 „ 8 „
„ sabinæ ... 20 m. „ 1 „
„ scillæ ... ... 10 „ 30 min.
„ senegæ ... ... ½ „ 2 fl. dr.
„ sennæ ... ... 1 „ 4 „
„ serpentariæ ... ½ „ 2 „
„ stramonii... ... 10 „ 30 min.
„ strophanthi ... 2 „ 10 „
„ sumbul ... ... 10 „ 30 „
„ tolutana ... ... 20 „ 40 „
„ valerianæ... ... 1 „ 2 fl. dr.
„ „ ammon. ½ „ 1 „
„ veratri vir. ... 5 „ 20 min.
„ zingiberis... 15 m. „ 1 fl. dr.
„ „ fort. ... 5 „ 20 min.
Troch. acid. benzoici 1 „ 5 loz.
„ „ tannici... 1 „ 6 „
„ bismuthi ... 1 „ 6 „
„ catechu ... 1 „ 6 „
„ ferri redacti... 1 „ 6 „

Troch. ipecacuanhæ ...	1	to	3	loz.	Vin. ferri cit.	1	to 4 fl. dr.
,, morphinæ ...	1	,,	6	,,	,, ipecac. (as expectorant) ...	5	,, 40 min.
,, ,, et ipecac.	1	,,	6	,,	,, ,, (as emetic)	3	, 6 fl. dr.
,, opii	1	,,	6	,,	,, opii	10	,, 40 min.
,, pot. chloratis	1	,,	6	,,	,, quininæ	½	,, 1 fl. oz.
,, santonini ...	1	,,	6	,,	,, rhei	1	,, 2 fl. dr.
,, sodii bicarb. ...	1	,,	6	,,	Zinci acetas (as tonic)	1	,, 2 gr.
,, sulphuris ...	1	,,	6	,,	,, ,, (as emetic)	10	,, 20 ,,
Valerianæ rhizoma ...	10	,,	30	gr.	,, oxidum	2	,, 10 ,,
Vin. aloes	1	,,	2	fl. dr	,, sulphas (as tonic)	1	,, 3 ,,
,, antimoniale	5	m. ,,	1	,,	,, ,, (as emetic)	10	,, 30 ,,
,, colchici	10	,,	30	min.	,, valerianas ...	1	,, 3 ,,
,, ferri	1	,,	4	fl. dr.			

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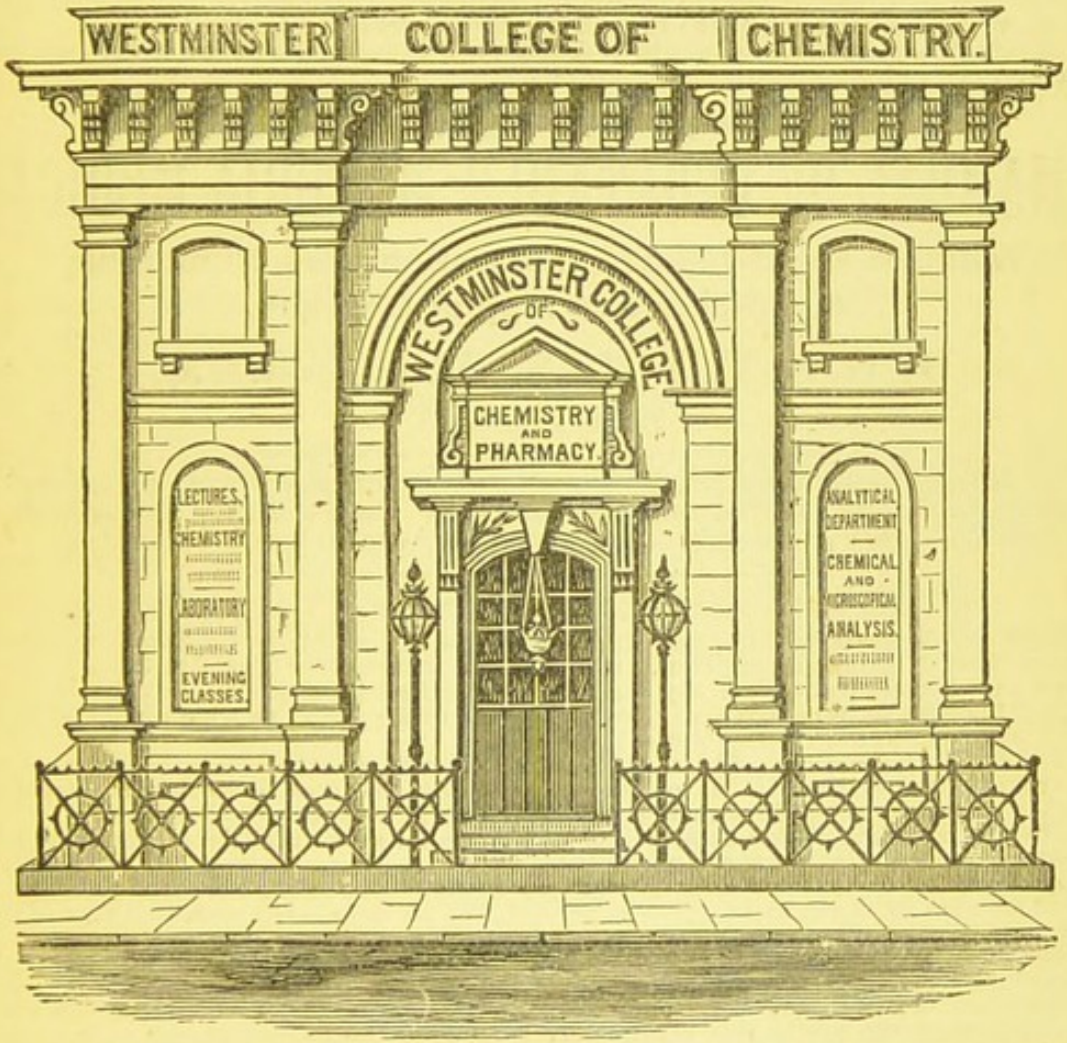

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Price 4/6.

WILLS' MATERIA MEDICA CABINET.

Price, 5s.; Carriage Free, 5s. 9d.

Comprising 150 carefully selected Specimens packed in wooden box.

CONTENTS.

The numbers before the names of the Specimens correspond with the numbers on the Boxes containing them.

No.	*Names.*
1.	Aconite Leaves
2.	Aconite Root
3.	Podophyllum Rhizome
4.	Hellebore Rhizome
5.	Stavesacre Seeds
6.	Actæa Rhizome
7.	Star Anise
8.	Winter's Bark
9.	Calumba Root
10.	Pareira Root
11.	Cocculus Indicus
12.	Red Poppy Petals
13.	Arnica Leaves
14.	Squill
15.	Barbadoes Aloes
16.	Socotrine Aloes
17.	Cape Aloes
18.	Colchicum Corm
19.	Black Mustard Seeds
20.	White Mustard Seeds
21.	Horseradish Root
22.	Colchicum Seeds
23.	Senega Root
24.	Rhatany Root
25.	Linseed
26.	Cotton Wool
27.	Marsh Mallow Root
28.	Oil of Theobroma
29.	Green Hellebore Root
30.	Bitter Orange Peel
31.	Lemon Peel
32.	Bael Fruit
33.	Canella Bark
34.	Male Fern
35.	Raisins
36.	Guaiacum Wood
37.	Guaiacum Resin
38.	Buchu Leaves
39.	Cusparia Bark
40.	Quassia Wood
41.	Simaruba Bark
42.	Buckthorn Berries
43.	Mastich
44.	Ergot
45.	Myrrh
46.	Elemi
47.	Olibanum
48.	Liquorice Root
49.	Tragacanth
50.	Fennel Fruit
51.	Broom Tops
52.	Red Sandal Wood
53.	Kino
54.	Coriander Fruit
55.	Caraway Fruit
56.	Calabar Bean
57.	Logwood
58.	Alexandrian Senna
59.	Tinnevelly Senna
60.	Cassia Pod
61.	Dill Fruit
62.	Gum Acacia
63.	Black Catechu
64.	Cabbage Rose Petals
65.	Red Rose Petals
66.	Rue
67.	Tormentilla Rhizome
68.	Bitter Almonds
69.	Sweet Almonds
70.	Cherry Laurel Leaves
71.	Kousso
72.	Cloves
73.	Pimento [Bark
74.	Pomegranate Root
75.	Colocynth Pulp
76.	Carrot Fruit
77.	Hemlock Leaves
78.	Hemlock Fruit
79.	Coca Leaves
80.	Galbanum
81.	Ammoniacum
82.	Sumbul Root
83.	Elder Flowers
84.	Frangula Bark
85.	Sacred Bark
86.	Soap Bark
87.	Ipecacuanha
88.	Pale Catechu
89.	Valerian Root
90.	Pellitory Root
91.	Santonica
92.	Chamomile Flowers
93.	Dandelion Root
94.	Arnica Root
95.	Lobelia
96.	Bearberry Leaves
97.	Sumatra Benzoin
98.	Manna
99.	Hemidesmus Root
100.	Nux Vomica Seed
101.	St. Ignatius' Bean
102.	Gentian Root
103.	Chiretta
104.	Scammony Root
105.	True Jalap
106.	Slippery Elm Bark
107.	Dulcamara
108.	Capsicum Fruit
109.	Belladonna Leaves
110.	Belladonna Root
111.	Stramonium Leaves
112.	Stramonium Seeds
113.	Digitalis Leaves
114.	East Indian Rhubarb
115.	English Rhubarb
116.	Nutmeg
117.	Cinnamon Bark
118.	Cassia Buds
119.	Henbane Seeds
120.	Sassafras
121.	Bebeeru Bark
122.	Serpentary Root
123.	Mezereon Bark
124.	Cascarilla Bark
125.	Croton Seeds
126.	Castor Oil Seeds
127.	Kamala
128.	Black Pepper
129.	Cubebs
130.	Matico Leaves
131.	Elm Bark
132.	Oak Bark
133.	Galls
134.	Jaborandi Leaves
135.	Cannabis Indica
136.	Hop
137.	Fœnugreek
138.	Resin
139.	Grains of Paradise
140.	Common Frankin-
141.	BurgundyPitch[cense
142.	Aniseed Fruit
143.	Juniper Berries
144.	Savin Tops
145.	Larch Bark
146.	Ginger
147.	Cardamoms
148.	Turmeric
149.	Maw Seeds
150.	Sarsaparilla Root

PRICE LIST OF TEXT BOOKS.

Students are supplied with the following Books, &c., at the net prices named. Remittance must in every case be sent with order, also the amount necessary for postage, as the books cannot be sent to wholesale houses for enclosure, nor by carrier.

BOOKS.	Published Price.		Net Price.		Postage required.	
	s.	d.	s.	d.	s.	d.
Wills' Advanced Materia Medica (Illustrated)	10	6	8	0	0	4½
,, Elementary ,, ,, ...	5	0	3	9	0	3
,, Elements of Pharmacy	6	6	5	0	0	4½
,, Handbook to Analysis	2	6	2	0	0	2½
,, Chemistry, Vol. I., Non-Metals	3	0	2	3	0	3
,, Lecture Notes on Botany	4	6	3	6	0	6
,, Guide to Prescription Reading	1	6	1	2	0	1
,, Præscripta	1	0	0	9	0	1
,, Doses of Pharmacopœia	0	4	0	4	0	1
Wootton's Problems in Chemical Physics	3	0	2	3	0	3
Wills' Preliminary Exercises	3	0	2	3	0	3
,, Skeleton Latin Grammar	0	6	0	4½	0	1
,, Cæsar, Parsed	0	6	0	4½	0	1
,, Book of 120 Autograph Prescriptions ...	1	6	1	2	0	1
British Pharmacopœia...	6	0	5	0	0	6
Attfields' Chemistry	15	0	11	9	0	6
Bentley's Manual of Botany	15	0	11	3	0	6
,, Student's Guide to Structural Botany ...	7	6	5	8	0	4½
Bland's Botany	1	0	0	10	0	2
Prantl and Vines' Botany	9	0	6	9	0	4½
Watts' Inorganic Chemistry (Fownes)	9	0	6	9	0	4½
,, Organic ,, ,, ...	10	0	7	6	0	4½
Ganot's Popular Natural Philosophy	7	6	5	8	0	4½
Remsen's Organic Chemistry...	6	6	5	0	0	3
Thorpe's Metals	3	0	2	3	0	3
,, Non-metals	3	0	2	3	0	3
Latin Grammar...	2	6	2	0	0	2
Gills' English Grammar	1	0	0	9	0	1½
White's Cæsar, Book I.	1	0	0	9	0	1
Arnold's Translation of Cæsar, Book I.	1	6	1	2	0	1
Metric System	0	3	0	3	0	1
Mackay's Arithmetical Exercises, Part V. ...	0	4	0	4	0	1
Wills' Materia Medica Cabinet	5	0	5	0	0	9
,, Book of Dried Medicinal Specimens ...	5	0	5	0	0	3
Set of Chemical Apparatus (Minor)...	14	6	14	6	1	0
,, ,, ,, (Major)...	30	0	30	0	1	0

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SYLLABUS

OF

WILLS'

UNIVERSAL POSTAL SYSTEM

OF PREPARATION

FOR THE

PRELIMINARY, MINOR, AND MAJOR

EXAMINATIONS

OF THE

PHARMACEUTICAL SOCIETY.

THE WESTMINSTER COLLEGE OF CHEMISTRY AND PHARMACY,
TRINITY SQUARE, BOROUGH, LONDON, S.E.

THE fact that a very large proportion of students fail to pass the Examinations of the Pharmaceutical Society, even in many cases after very diligent self-preparation, shows most clearly the *absolute necessity* of a DEFINITE SYSTEM OF INSTRUCTION.

Among these rejected candidates, some of whom, in the bitter disappointment of failure, throw up all hope of a pharmaceutical career, and betake themselves to other paths in life, there are, no doubt, many who, had their studies been directed by a competent master, or pursued in accordance with a systematic and definite plan, would not only have passed the examination with ease and credit, but also have become honoured and distinguished members of the profession they aspired to join.

This systematic training, which we see is so conducive to a successful course of study, may best be obtained by a residence for a longer or shorter period at such an institution as the Westminster College of Chemistry and Pharmacy; but to those who are unable at present to carry out this plan, *Wills' Universal Postal System of Instruction* will be found of the very greatest service.

This system has now been in operation for eighteen years, and has been found to be a most complete and unbounded success. By its means a Student residing in any part of the kingdom may be prepared with almost equal facility with those who, living in London or other large cities, are able to attend a regular course of instruction; and thus it will be seen that this system is eminently applicable to country students. Their satisfaction at its results is testified by the numerous testimonials constantly received, which may be seen at the office of the College.

Those also who are looking forward to personally attending a definite course of instruction are advised to take the Postal Course first, as that will shorten the time necessary for them to attend at College, and, consequently, materially lessen the ultimate expense.

PRELIMINARY DIVISION.

FEE—HALF-A-GUINEA.

This course consists of 120 Printed Lectures, in the production of which no expense or pains have been spared. They have been carefully revised, in order to embrace those changes and alterations in Latin and English Grammar which have been made by modern grammarians; and Mr. WILLS has no hesitation in stating that, after a careful study of these Lectures, a candidate is fully prepared for Examination.

Special attention has been paid to those subjects in a knowledge of which students are generally found deficient, especially LATIN GRAMMAR AND PARSING, ENGLISH ESSAY WRITING, AND THE METRIC SYSTEM OF WEIGHTS AND MEASURES, while the Lectures containing hints to intending candidates will be found of the greatest practical utility.

As the lectures commence quite at the beginning of each subject, no special preparation is necessary before commencing the Course.

MINOR DIVISION.

FEE—ONE GUINEA.

The course is divided into one hundred Lectures, treating on the various subjects required in the examinations of the Pharmaceutical Society. The following are sent to each Pupil :—Copies of numerous valuable Autograph Prescriptions, collected from all parts of England ; over one hundred difficult printed Formulæ for Mixtures, Emulsions, Pills, Liniments, &c., for Practical Dispensing (all of which have been given at the Minor Examination), with full directions how to dispense them ; Powders for Analysis, &c.

The Lectures are intended not only to prepare the Student for his examination, but to give him a thorough knowledge of every drug used in the ordinary routine of business. As the Lectures treat upon every branch of the profession, they will be the means not only of making apprentices more useful to their employers, but of furnishing them with every information necessary for the completion of an apprenticeship, and the proper performance of their duties in after life. The course of instruction is not limited to any period, but may be made to extend to any length of time from three months to four years, without extra cost.

PRESCRIPTION READING.—Special attention is paid to the reading of autograph prescriptions, which is so much neglected by country students, not merely from want of application, but from the fact that they seldom meet with autograph prescriptions ; to such this valuable collection will be found most useful. Printed prescriptions, as found in books, may assist the student, but cannot suffice to qualify him for his examination.

PRACTICAL DISPENSING.—These Lectures treat on the best modes and excipients for forming pills, powders, emulsions, mixtures, &c., &c. One hundred and fifty difficult formulæ are sent for the student to dispense at his leisure. No directions are given at the time of sending, but follow in subsequent Lectures.

PHARMACY.—The numerous preparations in this subject, which often cause great taxation of the memory, and the principles of the different processes, are so interestingly imprinted on the memory, and further impressed by a series of well-directed questions, that the Student cannot help but comprehend and retain them with facility.

MATERIA MEDICA.—These Lectures will be found most useful in assisting the Student's memory. The whole subject is thoroughly exhausted by means of questions to be answered by the Student.

BOTANY being a subject somewhat difficult to master by mere book reading, is taught by sending easy and progressive Lectures, and thus the subject will be found remarkably easy and pleasant, and will enable the Student to take his walks in the fields with redoubled pleasure.

CHEMISTRY, PRACTICAL AND THEORETICAL.—This subject, so much dreaded by Country Students, may be mastered with perfect ease. Those who are unable to do practical analysis during business may defer that portion of the instruction until they can make it convenient to enter the College for a short term.

Powders for analysis are sent to Students who have conveniences for Practical Chemistry.

Independent of the primary object of these Lectures, it is considered that the advantage of having a tutor to correspond with, who can solve any difficulty the Student may meet with in the course of his studies, is alone worth the remuneration.

MAJOR DIVISION.

FEE—HALF-A-GUINEA.

The following books are used in conjunction with this course, and will be sent carriage free for the prices named :—Wills' "Materia Medica," illustrated, 8s. 6d. ; Ganot's "Popular Natural Philosophy," 6s. 6d. ; Watts' "Organic Chemistry," 8s. 6d. ; Watts' "Inorganic Chemistry," 7s. 6d. ; "Prantl and Vines' Botany," 7s. 6d. The Student's study is carefully directed, and a number of questions on each subject is sent weekly.

"The idea on which this system is based is to arrange for each Student his course of study, and to provide him generally with that knowledge which he needs to know."—*Chemist and Druggist.*

Compound Powders for analysis are sent to those Students who have facilities for Practical Chemistry, and their reports corrected, at a charge of 2s. per dozen Powders.

It has been proved over and over again that it is of little or no use for Students to purchase various books for the purpose of reading up for Examinations. Those who have thus prepared themselves not only fail to satisfy the Examiners, but are also found to have acquired a very incomplete and confused idea of the subjects they have attempted to master.

Students who have commenced to read in this way, and have not the benefit of a tutor to guide them in their work, are advised at once to enter under the "UNIVERSAL POSTAL SYSTEM," *when they cannot fail to make rapid progress.*

RULES.

1. One or more Lectures, according to the amount of time the Student has at his disposal, are sent Weekly, or Fortnightly, leaving the College on Monday by the afternoon post.

2. The Lectures must be studied, and the originals returned in a large envelope, addressed to the College. There must also be enclosed a large envelope, with the Student's address, and with a 1d. stamp affixed, if for one Minor or Major Lecture, or 1½d., if for two ; two Preliminary Lectures will go for 1d., or four for 1½d.

3. The Lectures must reach the College on or before the following Monday morning, or the next Lecture will not be sent until the Monday after.

4. To prevent mistakes, each Student must see that his number is stated on the corner of the envelope he encloses ; if this is neglected, his Lectures may be delayed a week.

5. In the event of Lectures being returned, without a stamped addressed envelope, the Student will not receive any more until such envelope be sent.

6. Any Student retaining his Lectures for more than a fortnight, will be fined six stamps.

7. In the event of Students not being able to purchase envelopes large enough, they can be obtained from the College, at the rate of 3d. per dozen, post free, with the Student's number stamped on.

8. All letters and papers of enquiry must bear the name and number of the writer, and sufficient space must be left between each question for the answer.

9. The Lectures must *not* be *folded*, or marked in any way ; if a Lecture be lost or damaged, a fine of One Shilling will be enforced.

10. To prevent mistake, each Student is requested to write in ink, under the stamp of the envelope he encloses, the numbers of the Lectures next in order, which he is to receive. Examples :— If he is returning No. 8, he should write a large **9** ; or if he is returning Nos. 31 to 35, he should write **36** to **40** in large figures, under the stamp of the envelope addressed to him, which he encloses.

N.B.—Students are particularly cautioned against receiving more Lectures weekly than they have time to thoroughly master.

Any Student not receiving his Lectures within three days after they are due, will oblige by writing for the same on Post Card.

OPINIONS OF THE PRESS.

CHEMIST AND DRUGGIST.

"The system of lecturing on pharmacy and its associated studies through the post has been developed by Mr. G. S. V. WILLS, of the Westminster College of Pharmacy, to what we regard as quite a surprising extent.

"A few years ago, everybody was interesting himself, to a greater or less extent, in the problem of 'provincial pharmaceutical education.' Essays were written, orations delivered, committees formed, and schemes proposed, with the object of elevating our educational standard *en masse*. To estimate the result of all this united and personal effort would be a melancholy and thankless task. The success which Mr. WILLS' well-directed enterprise has met with, proves that, after all, the real want was rather commercial than intellectual, and was to be met by commercial rather than by charitable or æsthetic procedure. We mean that the advancing generation of pharmacists were not, as a body, pining for mental culture so much, as they were told, they were morally bound to be. What they wanted was the means of educating themselves sufficiently to pass the necessary examinations, so that they might have a fair prospect of an honourable living before them. Those who met this want intelligently and competently have been handsomely rewarded for their pains. Those who tried to thwart it are left with a consolatory sense of their own high-mindedness, but with little else.

"In order to make ourselves fully acquainted with the details of this postal system of instruction, we recently paid Mr. WILLS a visit, quite unexpectedly to him, and obtained the most complete satisfaction of our curiosity. Everything was open to our inspection, down to the printer's bills and private accounts, and everything was in such neat order, that the whole procedure could be comprehended in a few minutes.

"Mr. WILLS receives postal pupils for either the Preliminary, the Minor, or the Major examinations, a different course being provided in each case. The fee being paid, the lectures are sent in rotation, generally two per week. The student having digested his one, two, or four lectures per week, as the case may be, returns them with an addressed envelope, and a new set goes off. The whole course may be extended over several years, or condensed into a few months, at the student's option, but regularity is insisted upon. The idea on which the system is based is to arrange for each student his course of study for him, and to provide him generally with that matter which he needs to know. If he wishes it, samples of salts for analysis are also included in the course, and he is also encouraged to communicate with the College in all questions of difficulty which may occur to him."

"Since the real hard work for pharmaceutical examinations began after the passing of the Pharmacy Act, 1868, by virtue of which it became imperative for a stringent ordeal to be passed, and consequently required very considerable fagging up and preparation, the aspirants to pharmacy honours have, contrary to anticipation, in no wise decreased; on the contrary, they have increased, inasmuch as, now that pharmacy is recognized at the hands of the State as a legitimate profession, young men from the best ranks of society have enrolled themselves under its banner to fight the good fight, and in order to meet and cope with this unexpected influx, the Society has, from time to time, increased the rigour of its examinations, until to-day getting through the pharmaceutical trial is no mean accomplishment; and young men who have successfully pulled through are to be complimented on their prowess, and encouraged to future exertions, particularly if these young people are, to a certain extent, self-instructed, that is, if they have entirely worked up and passed the examination without any ulterior assistance from those well-informed gentlemen who especially devote themselves to the preparation of students, and who, by virtue of hard and conscientious labour, rarely fail to pass the greater part of their pupils. If, as we before said, a young man 'gets through' his examinations without this aid, then he does a great thing; but facts have determined that, whereas nine out of ten students self-prepared, and highly self-opiniated with a belief in their own capabilities, lamentably fail, and to some extent, therefore, are the victims of personal pique and professional ridicule, not to say disgrace, the same proportion of individuals who undergo professional training at the hands of a recognized tutor, pass easily. This is probably from the fact that the ordinary run of would-be well-informed young men especially study those particular points upon which they will *not* be examined, because they have no idea what the examination consists of.

"Probably the young man who is an assistant or apprentice some hundreds of miles from London, will declare with a regretful sigh that he cannot afford the time or the money to come to London and study, and that he has no means beyond his own personal efforts therefore to rely on. We should cordially sympathize with this person, because we feel sure he would never be a successful Pharmaceutical Chemist, did we not know that he has an all-sovereign balm for his woes at hand, obtainable for the expenditure of a mere trifle, and therefore leaving it simply his own fault, and deserving it, if he blindly labours on in ignorant darkness. Mr. WILLS, of Westminster College, one of our most thoroughly successful 'tutors,' extends him a helping hand. The postal system, which this gentleman has introduced and carried out with the most complete success, is an extraordinary advantage to that class of pharmaceutical students to which we have more particularly referred, as it tenders him an opportunity of working at his own quarters, miles away from London, assisted by an efficient London master.

"We have visited Mr. WILLS' establishment, and having thoroughly gone into every particular in connection with the working of the system, have much pleasure in recommending it. Specimen salts for analysis and lectures are posted weekly from this establishment to the students in all parts of the country. His stock of books, lectures, &c., which he sends to his pupils, amounts in value to hundreds of pounds, and it is therefore scarcely necessary to point out to our readers the immense advantage such a fine library affords. The preliminary, minor, and major examinations are all treated with the postal system with equal success; and the fact that at the period of our call on Mr. WILLS he had some nine hundred students on his books, will clearly demonstrate the importance of the system and the support it is receiving. We cordially advise a trial of Mr. WILLS' principle, and we have every confidence the essayist will not be disappointed."

MATHER'S ILLUSTRATED PRICE CURRENT.

"The success which seems to have attended the introduction of this novel system of preparing students for Bloomsbury Square, proves that it supplies a want much needed; and anyone who will take the trouble to ascertain the *modus operandi* of Mr. WILLS' excellent system will be astonished by its originality and completeness.

"We can readily understand what a boon it must be to many employers who can ill spare their apprentice or assistant, that they can, without leaving their counters, become pupils of Westminster College, with every probability of gaining the envied title of 'Pharmaceutical Chemist.' Not that we should presume to assert that an epistolary mode of instruction can equal an oral; yet the results of the number of students who have passed at the Pharmaceutical Society's examinations, and who have studied under Mr. WILLS' Postal system, goes far to show that much may be done by it, and speaks volumes for its efficiency.

"We have had an opportunity of inspecting the arrangements made at the Westminster College for carrying out this mode of instruction, and are not at all surprised that Mr. WILLS has the boldness to print on his prospectus, 'Success Guaranteed.' The manner of teaching adopted by this system is certainly too sound to have the slightest character of cramming, unless it be that it crams the student with the knowledge requisite to pass the stiff examinations at Bloomsbury Square, and to perform the duties of a pharmacist creditably to himself and with satisfaction to the public; and no system can accomplish more. To an ardent, anxious pupil, we believe there is a short cut from Westminster College to Bloomsbury Square, and that any student can become a Pharmaceutical Chemist if he *Wills* it."

For Prospectus of College, and Particulars of Courses of Lectures and Laboratory Instruction, apply to Messrs. Wills & Wootton, Westminster College of Chemistry and Pharmacy, Trinity Square, Borough, London, S.E.