A

TRANSLATION

OF THE

PHARMACOPŒIA

OF THE

ROYAL COLLEGE OF PHYSICIANS,

OF LONDON.

1824.

WITH NOTES AND ILLUSTRATIONS.

SECOND EDITION.

BY

RICHARD PHILLIPS, F. R. S. L. & E. &c.

FORMERLY LECTURER ON CHEMISTRY IN THE LONDON INSTITUTION, AND ON PHARMACEUTIC CHEMISTRY IN THE THEATRE OF ANATOMY, WEBB-STREET, SOUTHWARK.

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ADVERTISEMENT.

In preparing the notes accompanying this Translation, my views have been chiefly directed to what I conceived to be the wants of the medical student, with the intention of offering him a concise explanation of the chemical changes which occur during the preparation of medicines,—of the qualities which indicate their perfection,—and of the means by which he may detect the adulterations to which they are subjected. They who know how small a portion of the time which the pupil has at his disposal, can be dedicated to the acquirement of chemical and pharmaceutical knowledge, will readily admit the propriety of removing, as much as possible, all impediments to his progress.

I have endeavoured to render the translation as literal as the circumstances of the case would allow, and but few liberties have been taken with the original; to those, however, who may compare the translation with it, I shall explain my reasons for deviating, in a few instances, from the alphabetical arrangement adopted by the College: under the head of *Alkalia et eorum Sales*, Potassæ Carbonas correctly precedes Potassæ Subcarbonas; but my object being that of explaining the nature of the chemical compounds, and of describing the circumstances in which they differ

from each other, I have, on this occasion, reversed the order, and have treated first of subcarbonate of potash, because the knowledge of its properties must be acquired, before those of the carbonate, into the composition of which it enters, can be understood.

I am very far from supposing that an acquaintance with the qualities of bodies, can lead, *a priori*, to that of their medicinal use; hence there is no circumstance on which to ground an opinion as to the comparative medicinal powers of protoxide and peroxide of antimony; but since it has been proved by experience, that the former is an active, and the latter a nearly inert substance, it follows that the medicinal properties of these oxides are connected with, and dependent upon, their chemical relations; this, therefore, is one among many instances in which chemical investigations are shewn to be intimately connected with pharmaceutical preparations; and hence, although my attention has been principally bestowed upon the learner, I flatter myself that the results of some of my experimental researches, may prove not totally devoid of interest even to those, who may long have been practitioners in medicine; I allude more particularly to what these researches have enabled me to say respecting the preparations of iron, especially as to the nature and quantity of oxide which they contain, both when prepared according to the direction of the College, and as usually met with in the shops: and I trust that the analyses and observations will be useful, not only in causing greater uniformity in the preparation of the medicines in question, but also in guiding the practitioner to the selection of such

as obviously, from their chemical properties, merit the greatest reliance.

It is of unquestionable importance that the medicines directed to be prepared by the College, should possess the requisite strength; but supposing the *liquor ammoniæ*, for example, to be prepared on the large scale, much stronger and at less expense than by the Collegiate process, there cannot, I conceive, be any objection to its being used, when it has been so diluted with water as to reduce it to the standard strength. So also, in preparing the carbonate of potash, provided a perfect salt be obtained, it must be indifferent to the College, whether the carbonic acid is evolved from the decomposition of marble by sulphuric acid, or by using muriatic acid, as I have suggested, with chalk; consistently with these views, there will be found interspersed among the remarks that I have offered, some hints which may, I think, not be useless to the practical chemist.

With respect to the diagrams, of which I have made so much use, I shall offer a few words in explanation. It is to be understood, that the new compounds formed during a process, or constituents assuming a fresh state, are denoted by being printed in italics: thus a solution of sulphate of soda being mixed with one of nitrate of lime, the new compounds formed are *sulphate of lime* and *nitrate of soda*, and supposing one of the resulting substances to be a solid, that is generally placed at the bottom of the diagram. When nitric acid is added to carbonate of lime, the carbonic acid assumes a fresh state, and in this case it is thus described—carbonic acid *gas;* the only change which it undergoes, being

from the state of solid combination, to that of an uncombined elastic fluid.

There is one curious and interesting department of science which has been much and long neglected, I mean that of the crystalline forms of salts; and in order to ascertain that hitherto it has been in a very imperfect state, it will be sufficient for the reader to compare the statements of the most respectable chemical writers. With one exception, noticed in its proper place, I am indebted for all that I have given upon this subject to my friend, Mr. Brooke, and to the papers which he has contributed to the "Annals of Philosophy." I feel confident that in the path which he is yet pursuing, he will meet with facts that will enrich chemical science with much curious and useful information.

Well knowing how necessary it is that the student should be acquainted with the powers and doses of preparations, I have generally given an account of them; but not being a medical practitioner, the best authorities on the subject have been consulted and quoted, and I need do no more to inspire confidence in this statement, than to observe, that, with few exceptions, I am indebted for them to Dr. Paris's "Pharmacologia," and I have great pleasure in acknowledging his friendly assistance on various occasions connected with this translation. In justice to Dr. A. T. Thomson, it is proper to state that I have, in some instances, advantageously consulted his London Dispensatory.

RICHARD PHILLIPS.

PREFACE TO THE EDITION OF 1809.

Scarcely have two and twenty years elapsed, and we have resolved again to revise our Pharmacopœia. The daily cultivated and enlarged knowledge of Nature has imposed this task upon us; for within these few years it has been so freed from errors, illustrated by so many experiments, and so established on every side on new, firmer, and more profound principles, that if the part of it which relates to medicine should remain neglected and unimproved, we should deservedly incur reproach; especially when of the two sciences most connected with ours—Chemistry and Botany—the latter has searched out the plants of every region, with the greatest labour; and the former has changed its entire system for a better, and learned to speak a language entirely new. It seemed, therefore, that there was no further reason for delay, but that we ought to examine, with the utmost attention, the virtues and nature of all medicines, in order that if there were any which we should consider either obsolete or superfluous, they might be rejected.

Our predecessors have indeed very much contributed towards having every thing prepared with greater accuracy and promptness; for in their days, the new light of philosophy was beginning to appear, which dispersed the clouds

of the ancient system, and banished groundless apprehensions together with their darkness; and, in short, so far disclosed the secrets of Nature, as to expose plainly to the eyes of Physicians, what was incongruous, what accordant, those things which were incompatible, and those most perfectly associated in composition. But it is the condition of art, that although it may be improved, it cannot be rendered perfect.

Every year since that period has, therefore, brought some accession to Medicine; nor has this our age, discontinued what the former had begun, but has more accurately described the symptoms of some diseases, discovered more suitable remedies for others, rejected some useless and inadequate medicines, and approved, from experience and authority, of others more efficacious; it has examined the whole more diligently, or taught how they may be compounded with greater skill. When, therefore, we first applied our minds to the revisal of this work, we discovered many things which ill accorded with the more perfect state of our art,—more which were at variance with that learned system of nomenclature which philosophers have latterly devised, and some also which the accuracy and order of the work itself required to be added. It did not, however, escape us that much inconvenience, and even great danger, result from a frequent alteration of Pharmacopœias: but we were persuaded, that whatever was most strictly consonant with sound reason, would in the end be the most permanent and useful. These things having been maturely considered, we resolved, as far as it could be effected, to affix such names to medicines as

were sanctioned and suitable to their nature; taking care, however, that the length of the appellations should not embarrass Physicians. When, therefore, it required many words clearly to express the composition of any thing, we have preferred a more simple, although a less scientific appellation.

As far as regards ourselves, we have spared no pains to render this book as perfect as possible. We do not, however, presume that it will be satisfactory to every one, or that no errors have been committed; but should any person be inclined to notice them with asperity, let him consider how much variety and difficulty are involved in a work of this kind, and we hope that he will not then be offended with a few blemishes.—But no more on this subject.

Some terms, however, require more apology, as they seem to deviate more than is necessary from common usage, such as *Anthemis*, while others sound harsh and barbarous, as *Potassa*. We hesitated long, but what could we do against the authority of all natural philosophers, or how could we retain those names of animals, plants, or minerals, which the principal writers in this branch of science had applied to different objects? We have, therefore, preferred incurring the accusation of barbarism, to admitting terms of doubtful or uncertain meaning, or to dissenting in a few names from the universal custom of Chemists.

With respect to the change which we have determined to make in the measures of liquids, we have no reason to fear that it will be supposed to arise from a love of novelty, as it has long been desired by every one. The affixing of the

same term to a measure of liquids and the weight of solids, has frequently produced mistakes. We have not, however, presumed to alter the measure called a *gallon*, the capacity of which is defined by the King and Parliament; but we have considered it not only lawful, but our duty, to divide it into parts according to our discretion, and to assign to each a name.

To conclude: we hope we have followed that method in accomplishing this work, which is adapted to the subject treated of. Certainly we shall esteem it the most agreeable reward for these our exertions and anxieties, if they contribute to the public good; and shall appear to have so far succeeded as to indicate more certain remedies for diseases, while the diseases themselves are more speedily alleviated.

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THE

LONDON PHARMACOPŒIA.

WEIGHTS, MEASURES, &c.

TWO kinds of weights are used in England; one in the valuation of gold and silver, and the other in that of almost every other sort of merchandize. We employ the former, which is also called *Troy Weight*, and divide the pound in the following manner, viz.

The pound ℔.	contains	Twelve ounces	℥
.... ounce		Eight drachms	ʒ
.... drachm		Three scruples	℈
.... scruple		Twenty grains	gr.

We have added the signs by which every weight is usually designated.

In the measuring of fluids there is also a difference in measure, one appropriated to beer, and the other to wine; we adopt the latter, and employ a measure for fluids derived from the wine gallon.

The wine gallon is defined by the statutes of the kingdom, and for medicinal purposes we divide it as follows, viz.

The gallon	contains	Eight pints	O
.... pint		Sixteen fluidounces	f ℥
.... fluidounce		Eight fluidrachms	f ʒ
.... fluidrachm		Sixty minims	♏

We have added the signs by which we designate every measure.*

Care is to be taken, that neither copper nor lead enter into the composition of the substances of which mortars, measures, funnels or other vessels are made, in which medicines are either prepared or kept; on this account earthen vessels glazed with lead are improper.

Acid, alkaline, earthy and metallic preparations, and also salts of every kind, ought to be kept in stopped glass bottles.

We measure the degree of heat by Fahrenheit's thermometer, and when we direct a *boiling heat*, we mean that of 212°. A *gentle heat* denotes a temperature between 90° and 100°.

Whenever *specific gravity* is mentioned, we suppose the substance treated of to be of the temperature of 55°.

A *water bath* is that by which any substance contained in a proper vessel is heated, either by immersion in boiling water, or by exposure to steam.

A *sand bath* is made of sand to be gradually heated, in which any thing is placed contained in a proper vessel.

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* That error may not arise from the indiscriminate use of the same terms to denote both weights and measures, we have, after deliberation, devised certain new ones, which a little practice will render familiar.

We also measure the smallest portions of fluids in a glass measure, marked at equal distances; for the number of drops is fallacious and uncertain, since it requires nearly twice as many drops of any tincture, as it does of water, to fill the same measure.

MATERIA MEDICA.

In the second column, *Vegetables* are named according to Willdenow's edition of the Species Plantarum of Linnæus; *Animals*, according to Gmelin's edition of the Systema Naturæ of Linnæus, and *Chemical Substances*, according to modern nomenclature, unless it be otherwise expressed.

Abietis Resina, *Resin of the Spruce Fir.*	Pinus Abies, *The Concrete Resin.*
Absinthium, *Common Wormwood.*	Artemisia Absinthium.
Acaciæ Gummi, *Acacia Gum (Gum Arabic).*	Acacia vera, *The Gum.*
Acetosæ Folia, *Leaves of Sorrel.*	Rumex Acetosa, *The Leaves.*
Acetosella, *Woodsorrel.*	Oxalis Acetosella.
Acetum, *Vinegar.*	
Acidum Aceticum fortius. The *specific gravity* is to that of distilled water as 1,046 to 1,000. Eighty-seven grains of crystallized subcarbonate of soda are saturated by 100 grains of this acid.	Acidum Aceticum, é ligno destillatum. *Acetic Acid distilled from Wood.*
Acidum Citricum *Crystalli,* *Crystals of Citric Acid.*	
Acidum sulphuricum, *Sulphuric Acid.* Its *specific gravity* is to that of distilled water, as 1,850 to 1,000.	

Aconiti Folia, *Leaves of Monk's hood.*	Aconitum Napellus, *The Leaves.*
Adeps, *Hog's Lard.*	Sus Scrofa, *The Lard.*
Ærugo, *Verdigris.*	Subacetas Cupri impura, *Impure subacetate of copper*
Allii Radix, *Root of Garlic.*	Allium sativum, *The Root.*
Aloës spicatæ Extractum, *Extract of spiked Aloe (Socotrine Aloes).*	Aloë spicata, *The Extract.*
Althææ Folia et Radix, *Leaves and Root of Marsh-mallow.*	Althæa officinalis, *Leaves and Root.*
Alumen, *Alum.*	Supersulphate of Alumina and Potash,
Ammoniacum, *Ammoniac.*	Heracleum Gummiferum, *The Gum Resin.* WILLDENOW, *Hort. Berol.*
Ammoniæ Murias, *Muriate of Ammonia.*	Murias Ammoniæ,
Amygdalæ amaræ, *Bitter Almonds.* Amygdalæ dulces, *Sweet Almonds.*	Amygdalus communis, Var. γ. Var. β. *The Kernels.*
Amylum, *Starch.*	Triticum hybernum, *Wheat Starch.*
Anethi Semina, *Dill Seeds.*	Anethum graveolens, *The Seeds.*
Anisi Semina, *Anise Seeds.*	Pimpinella Anisum, *The Seeds.*
Anthemidis Flores, *Flowers of Chamomile.*	Anthemis nobilis, *The single Flowers.*
Antimonii Sulphuretum, *Sulphuret of Antimony.*	Sulphuretum Antimonii,
Antimonii Vitrum, *Glass of Antimony.*	Antimonii oxydum sulphuratum vitrifactum, *Vitrified sulphuretted oxide of Antimony.*
Argentum, *Silver.*	Argentum purificatum, *Purified Silver.*
Armoraciæ Radix, *Root of Horseradish.*	Cochlearia Armoracia, *The Root.*

Arsenicum album, *White Arsenic.*	Acidum Arseniosum, *Arsenious Acid.*
Asari Folia, *Leaves of Asarabacca.*	Asarum Europæum, *The Leaves.*
Assafœtidæ Gummi-resina, *Gum Resin of Assafœtida.*	Ferula Assafœtida, *The Gum Resin.*
Avenæ Semina, *Oats.*	Avena sativa, *The Seeds deprived of their husks (Grits).*
Aurantii Baccæ, *Seville Oranges.*	Citrus Aurantium (Hispalense), *The Fruit.*
Aurantii Cortex, *Orange Rind.*	*The outer Rind of the Fruit.*
Balsamum Peruvianum, *Peruvian Balsam.*	Myroxylon peruiferum, *The Balsam.*
Balsamum Tolutanum, *Balsam of Tolu.*	Toluifera Balsamum, *The Balsam.*
Belladonnæ Folia, *Leaves of the deadly Nightshade.*	Atropa Belladonna, *The Leaves.*
Benzöinum, *Benzoin.*	Styrax Benzöin, *The Balsam.*
Bismuthum, *Bismuth.*	
Bistortæ Radix, *Bistort Root.*	Polygonum Bistorta, *The Root.*
Cajuputi Oleum, *Cajuput Oil.*	Melaleuca Cajuputi, *The essential Oil.*
Calamina, *Calamine.*	Carbonas Zinci impura, *Impure Carbonate of Zinc.*
Calami Radix, *Root of the Sweet Flag.*	Acorus Calamus, *The Root.*
Calumba,	Cocculus palmatus, *The Root.* DE CANDOLLE, *Sys. Nat.*
Cambogia, *Gamboge.*	Stalagmitis Cambogiöides, *The Gum Resin.*
Camphora, *Camphor.*	Laurus Camphora, *A peculiar concrete obtained by sublimation.*
Canellæ Cortex, *Canella Bark.*	Canella alba, *The Bark.*

Cantharis, *Cantharides.*	Cantharis vesicatoria, LATREILLE, *Gen. Insect.*
Capsici Baccæ, *Berries of Capsicum (Cayenne Pepper).*	Capsicum annuum, *The Berries.*
Carbo Ligni, *Charcoal (fresh burnt).*	Carbo Ligni recens.
Cardamines Flores, *Cuckoo Flower (or Ladies' Smock).*	Cardamine pratensis, *The Flowers.*
Cardamomi Semina, *Seeds of Cardamom.*	Matonia Cardamomum, *The Seeds.* SMITH, *in Rees Cyclop.*
Caricæ Fructus, *Figs.*	Ficus Carica, *The dried fruit.*
Carui Semina, *Carraway Seeds.*	Carum Carui, *The Seeds.*
Caryophylli, *Cloves.*	Eugenia caryophyllata, *The Buds dried.*
Caryophyllorum Oleum, *Oil of Cloves.*	*Their essential Oil.*
Cascarillæ Cortex, *Cascarilla Bark.*	Croton Cascarilla, *The Bark.*
Cassiæ Pulpa, *Cassia Pulp.*	Cassia Fistula, *The Pulp of the Pods.*
Castoreum, *Castor.*	Castor Fiber (Russian), *A peculiar Concrete.*
Catechu Extractum, *Extract of Catechu.*	Acacia Catechu, *The Extract.*
Centaurii Cacumina, *Tops of the Centaury.*	Chironia Centaurium, *The Tops.*
Cera alba, *White Wax.*	
Cera flava, *Yellow Wax.*	
Cerevisiæ Fermentum, *Yeast.*	
Cetaceum, *Spermaceti.*	Physeter macrocephalus, *A peculiar Concrete.*
Cinchonæ cordifoliæ Cortex, *Bark of heart-leaved Cinchona (Yellow Bark).*	Cinchona cordifolia, *The Bark.* ZEA, *in Anal. de Hist. Nat.*
Cinchonæ lancifoliæ Cortex, *Bark of lance-leaved Cinchona (Pale Bark).*	Cinchona lancifolia, *The Bark.* ZEA, *in Anal. de Hist. Nat.*

Cinchonæ oblongifoliæ Cortex,	Cinchona oblongifolia,
Bark of oblong-leaved Cinchona (Red Bark).	*The Bark.* ZEA, *in Anal. de Hist. Nat.*
Cinnamomi Cortex,	Laurus Cinnamomum,
Bark of Cinnamon.	*The inner Bark.*
Cinnamomi Oleum,	*Its essential Oil.*
Oil of Cinnamon.	
Coccus,	Coccus Cacti.
Cochineal.	
Colchici Radix et Semina,	Colchicum autumnale,
Root and seeds of meadow Saffron.	*The fresh root and seeds.*
Colocynthidis Pulpa,	Cucumis Colocynthis,
Pulp of the bitter Apple.	*The Pulp of the Fruit.*
Conii Folia et Semina,	Conium maculatum,
Leaves and seeds of Hemlock	*The Leaves and Seeds.*
Contrajervæ Radix,	Dorstenia Contrajerva,
Root of Contrayerva.	*The Root.*
Copaiba,	Copaifera officinalis,
Copaiva.	*The liquid Resin.*
Coriandri Semina,	Coriandrum sativum,
Coriander Seeds.	*The Seeds.*
Cornua,	Cervus Elaphus,
Horns (of the Stag).	*The Horns.*
Creta,	Carbonas Calcis friabilis,
Chalk.	*Friable Carbonate of Lime.*
Croci Stigmata,	Crocus sativus (English),
Saffron.	*The Stigmata.*
Cubeba,	Piper Cubeba,
Cubebs.	*The Berries.*
Cumini Semina,	Cuminum Cyminum,
Cumin Seeds.	*The Seeds.*
Cupri Sulphas,	Sulphas Cupri.
Sulphate of Copper.	
Cuspariæ Cortex,	Cusparia febrifuga,
Cusparia or	*The Bark.*
Angustura Bark.	BONPLAND, *Voy.*
Cydoniæ Semina,	Pyrus Cydonia,
Quince Seeds.	*The Seeds.*
Dauci Radix,	Daucus Carota (cultivated),
Carrot Root.	*The Root.*
Dauci Semina,	Daucus Carota (wild),
Carrot Seeds.	*The Seeds.*

Digitalis Folia et Semina,	Digitalis purpurea,
Leaves and Seeds of purple Foxglove.	*The Leaves and Seeds.*
Dolichi Pubes,	Dolichos pruriens,
Cowhage.	*The Bristles of the Pods.*
Dulcamaræ Caulis,	Solanum Dulcamara,
Stalk of Bittersweet, or woody Nightshade.	*The Stalk.*
Elaterii Pepones,	Momordica Elaterium,
Wild Cucumbers.	*The fresh Fruit.*
Elemi,	Amyris Elemifera,
Elemi.	*The Resin.*
Euphorbiæ Gummi-resina,	Euphorbia officinarum,
The Gum-Resin of Euphorbium.	*The Gum-Resin.*
Farina,	Triticum hybernum,
Flour.	*The Flour.*
Ferrum,	Ferri Ramenta et Fila,
Iron.	*Iron Filings and Wire.*
Filicis Radix,	Aspidium Filix mas, SMITH, *Flor. Brit.*
Root of the male Fern.	*The Root.*
Fœniculi Semina,	Anethum Fœniculum,
Seeds of Fennel.	*The Seeds.*
Fucus,	Fucus vesiculosus.
Sea-wrack, or bladder Fucus	
Galbani Gummi-resina,	Bubon Galbanum,
Gum-resin of Galbanum.	*The Gum-resin.*
Gallæ,	Cynips Quercûs folii,
Galls.	*The Nest.*
Gentianæ Radix,	Gentiana lutea,
Root of Gentian.	*The Root.*
Glycyrrhizæ Radix,	Glycyrrhiza glabra,
Root of Liquorice.	*The Root.*
Granati Cortex,	Punica Granatum,
Bark of the Pomegranate.	*The Bark of the Fruit.*
Guaiaci Resina et Lignum,	Guaiacum officinale,
Resin & Wood of Guaiacum.	*Resin and Wood.*
Hæmatoxyli Lignum,	Hæmatoxylon Campechianum
Logwood.	*The Wood.*
Helenium,	Inula Helenium,
Elecampane.	*The Root.*
Hellebori fœtidi Folia,	Helleborus fœtidus,
Leaves of stinking Hellebore,	*The Leaves.*

Hellebori nigri Radix, *Black Hellebore Root.*	Helleborus niger, *The Root.*
Hordei Semina, *Barley Seeds.*	Hordeum distichon, *Seeds husked (Pearl Barley)*
Humuli Strobili, *Hops.*	Humulus Lupulus, *The dried Strobiles.*
Hydrargyrum, *Quicksilver.*	
Hyoscyami Folia et Semina, *Leaves and Seeds of Henbane.*	Hyoscyamus niger, *The Leaves and Seeds.*
Jalapæ Radix, *Root of Jalap.*	Convolvolus Jalapa, *The Root.*
Ipecacuanhæ Radix, *Root of Ipecacuanha.*	Callicocca Ipecacuanha, *The Root.* BROTERO, *in Act. Soc. Linn.*
Juniperi Baccæ et Cacumina, *Juniper Berries and Tops.*	Juniperus communis, *The Berries and Tops.*
Kino, *Kino.*	Pterocarpus Erinacea, *The Extract.* *Encycl. Method.*
Krameriæ Radix, *Rhatany Root.*	Krameria triandria, *The Root.* *Flor. Peruv.*
Lactuca, *Lettuce.*	Lactuca sativa.
Lavandulæ Flores, *Flowers of Lavender.*	Lavandula Spica, *The Flowers.*
Lauri Baccæ et Folia, *Berries and Leaves of the Bay Tree.*	Laurus nobilis, *The Berries and Leaves.*
Lichen, *Liver Wort.*	Lichen Islandicus, *Iceland Moss.*
Limones, *Lemons.*	Citrus medica, *The Fruit.*
Limonum Cortex, *Rind of Lemons.*	*Their exterior Rind.*
Limonum Oleum, *Oil of Lemons.*	*The essential oil of the exterior rind.*
Linum catharticum, *Purging Flax.*	Linum catharticum,
Lini usitatissimi Semina, *Linseed.*	Linum usitatissimum, *The Seeds.*

Magnesiæ Subcarbonas, *Subcarbonate of Magnesia.*	Subcarbonas magnesiæ.
Magnesiæ Sulphas, *Sulphate of Magnesia.*	Sulphas Magnesiæ purificata.
Malva, *Common Mallow.*	Malva sylvestris.
Manna, *Manna.*	Fraxinus Ornus, *The concrete Juice.*
Marmor album, *White Marble.*	Carbonas Calcis dura, *Hard Carbonate of Lime.*
Marrubium, *White Horehound.*	Marrubium vulgare.
Mastiche, *Mastich.*	Pistacia Lentiscus, *The Resin.*
Mel, *Honey.*	
Mentha piperita, *Peppermint.*	Mentha piperita. SMITH, *in Act: Soc. Linn.*
Mentha viridis, *Spearmint.*	Mentha viridis. SMITH, *in Act: Soc. Linn.*
Menyanthes, *Buckbean.*	Menyanthes trifoliata.
Mezerei Cortex, *Bark of Mezereon.*	Daphne Mezereum, *The Bark of the Root.*
Mori Baccæ, *Mulberries.*	Morus nigra, *The Fruit.*
Moschus, *Musk.*	Moschus moschiferus, *A peculiar concrete.*
Myristicæ Nuclei, *Nutmegs.*	Myristica moschata, *The Nuts and their expressed Oil.*
Myrrha, *Myrrh.*	*The Gum-resin of a tree not yet described.*
Olibanum, *Olibanum.*	Juniperus Lycia, *The Gum-resin.*
Olivæ Oleum, *Oil of the Olive.*	Olea Europœa, *Expressed Oil of the Fruit.*
Opium, *Opium.*	Papaver somniferum, *The concrete Juice of the unripe Capsules (Turkish)*
Opopanacis Gummi-resina, *Gum-Resin of Opopanax.*	Pastinaca Opopanax, *The Gum-resin.*
Origanum, *Marjoram.*	Origanum vulgare.

Ovum, *The Egg.*	Phasianus Gallus, *The Egg.*
Papaveris Capsulæ, *Capsules of the White Poppy*	Papaver somniferum, *The ripe Capsules.*
Petroleum, *Petroleum.*	
Pimentæ Baccæ, *Pimenta Berries.*	Myrtus Pimenta, *The Berries.*
Piperis longi Fructus, *Fruit of long Pepper.*	Piper longum, *The unripe Fruit dried.*
Piperis nigri Baccæ, *Black Pepper Berries.*	Piper nigrum, *The Berries.*
Pix abietina, *Burgundy Pitch.*	Pinus Abies, *The prepared Resin.*
Pix liquida, *Tar.*	Pinus sylvestris, *The prepared liquid Resin.*
Pix nigra, *Black Pitch.*	Pinus Sylvestris, *The prepared solid Resin.*
Plumbi Subcarbonas, *Subcarbonate of Lead.*	Subcarbonas Plumbi.
Plumbi Oxydum semivitreum *Semi-vitrified Oxide of Lead*	
Porri Radix, *Root of the Leek.*	Allium Porrum, *The Root.*
Potassæ Nitras, *Nitrate of Potash.*	Nitras Potassæ purificata.
Potassæ Sulphas, *Sulphate of Potash.*	Sulphas Potassæ.
Potassæ Supertartras, *Supertartrate of Potash.*	Supertartras Potassæ purificata.
Potassa impura, *Impure Potash (Pearlash).*	Subcarbonas Potassæ impura.
Pruna, *Prunes.*	Prunus domestica, *The dried Fruit.*
Pterocarpi Lignum, *Red Saunders Wood.*	Pterocarpus santalinus, *The Wood.*
Pulegium, *Pennyroyal.*	Mentha Pulegium
Pyrethri Radix, *Root of the Pellitory of Spain.*	Anthemis Pyrethrum, *The Root.*
Quassiæ Lignum, *Quassia Wood.*	Quassia excelsa, *The Wood.*

Quercûs Cortex, *Bark of the Oak.*	Quercus pedunculata, *The Bark.*
Resina flava, *Yellow Resin.*	Pinus sylvestris, *The residue left after the Oil of Turpentine has been distilled.*
Rhamni Baccæ, *Buckthorn Berries.*	Rhamnus cathartious, *The Berries.*
Rhei Radix, *Root of Rhubarb.*	Rheum palmatum, *The Root.*
Rhœados Petala, *Petals of the Red Poppy.*	Papaver Rhœas, *The Petals.*
Ricini Oleum et Semina, *Castor Oil and Seeds.*	Ricinus communis, *The Seeds, and the Oil expressed from them.*
Rosæ caninæ Pulpa, *Pulp of the Dog Rose. (The Hip).*	Rosa canina, *The expressed Pulp of the Berries.*
Rosæ centifoliæ Petala, *Petals of the Damask Rose.*	Rosa centifolia, *The Petals.*
Rosæ Gallicæ Petala, *Petals of the Red Rose.*	Rosa Gallica, *The Petals.*
Rosmarina Cacumina, *Tops of Rosemary.*	Rosmarinus officinalis, *The Tops.*
Rubiæ Radix, *Madder Root.*	Rubia Tinctorum, *The Root.*
Rutæ Folia, *Leaves of Rue.*	Ruta graveolens, *The Leaves.*
Sabinæ Folia, *Leaves of Savine.*	Juniperus Sabina, *The Leaves.*
Saccharum, *Moist Sugar.* Saccharum purificatum, *Refined Sugar.*	Saccharum officinale, *Preparations from the expressed Juice.*
Sagapenum, *Sagapenum.*	*The gum-resin of a plant not yet described.*
Salicis Cortex, *Bark of the Willow.*	Salix Caprea, *The Bark.*
Sâmbuci Flores, *Flowers of Elder.*	Sambucus nigra, *The Flowers.*
Sapo durus, *Hard Soap.*	*Soap made of the Oil of Olives and Soda (Spanish Soap)*
Sapo mollis, *Soft Soap.*	*Soap made of Oil and Potash.*

Sarsaparillæ Radix, *Root of Sarsaparilla.*	Smilax Sarsaparilla, *The Root.*
Sassafras Lignum et Radix, *Wood and Root of Sassafras.*	Laurus Sassafras, *Wood and Root.*
Scammoneæ Gummi-resina, *Gum-resin of Scammony.*	Convolvolus Scammonea, *The Gum-resin.*
Scillæ Radix, *Root of the Squill.*	Scilla maritima, *The Root.*
Senegæ Radix, *Root of Senega.* *(Seneka, or Rattlesnake Root.)*	Polygala Senega, *The Root.*
Sennæ Folia, *Leaves of Senna.*	Cassia Senna, *The Leaves.*
Serpentariæ Radix, *Serpentary (or Virginian Snake Root).*	Aristolochia Serpentaria, *The Root.*
Sevum, *Suet.*	Ovis Aries, *The Suet.*
Simaroubæ Cortex, *Simarouba Bark.*	Quassia Simarouba, *The Bark.*
Sinapis Semina, *Mustard Seeds.*	Sinapis nigra, *The Seeds.*
Sodæ Murias, *Muriate of Soda.* *(Common Salt).*	Murias Sodæ.
Sodæ Sub-boras, *Sub-borate of Soda.* *(Borax).*	Sub-boras Sodæ.
Sodæ Sulphas, *Sulphate of Soda.*	Sulphas Sodæ.
Soda impura, *Impure Soda (Barilla).*	Subcarbonas Sodæ impura.
Spartii Cacumina, *Broom Tops.*	Spartium scoparium, *The Tops.*
Spigeliæ Radix, *Root of the Indian Pink.*	Spigelia Marilandica, *The Root.*
Spiritus rectificatus, *Rectified Spirit.* *Its specific gravity is to that of Distilled Water as* 835 *to* 1,000.	

Spiritus tenuior, *Proof Spirit.* *Its specific gravity is to that of Distilled Water as* 930 *to* 1,000.	
Spongia, *Sponge.*	Spongia officinalis.
Stannum, *Tin.*	*Tin Filings.*
Staphisagriæ Semina, *Seeds of Stavesacre.*	Delphinium Staphisagria, *The Seeds.*
Stramonii Semina et Folia, *Seeds and Leaves of Stramonium.*	Datura Stramonium, *The Seeds and Leaves.*
Styracis Balsamum, *Balsam of Storax.*	Styrax officinale, *The Balsam.*
Succinum, *Amber.*	
Sulphur, *Sulphur.*	
Sulphur sublimatum, *Sublimed Sulphur.*	
Tabaci Folia, *Leaves of Tobacco.*	Nicotiana Tabacum, *The dried Leaves. (Virginian).*
Tamarindi Pulpa, *The Pulp of the Tamarind.*	Tamarindus Indica, *The pulp of the Pod.*
Taraxaci Radix, *Root of the Dandelion.*	Leontodon Taraxacum *The Root.*
Tartarum, *Tartar.*	Potassæ Supertartras impura.
Terebinthina Canadensis, *Canadian Turpentine.*	Pinus Balsamea, *The liquid Resin.*
Terebinthina Chia, *Chio Turpentine*	Pistacia Terebinthus, *The liquid Resin.*
Terebinthina vulgaris, *Common Turpentine.* Terebinthinæ Oleum, *Oil of Turpentine.*	Pinus sylvestris, *The liquid Resin and the Oil distilled from it.*
Testæ, *Shells.*	Ostrea edulis, *The Shell.*
Tiglii oleum, *Oil of Croton.*	Croton Tiglium, *The Oil expressed from the Seeds.*

Tormentillæ Radix,	Tormentilla officinalis, SMITH, *Flor. Brit.*
Root of Tormentil.	*The Root.*
Toxicodendri Folia,	Rhus Toxicodendron,
Leaves of Sumach.	*The Leaves.*
Tragacantha,	Astragalus verus. OLIVIER. *Voy. dans l'Empire Ottom.*
Tragacanth.	*The Gum.*
Tussilago,	Tussilago Farfara.
Coltsfoot.	
Valerianæ Radix,	Valeriana officinalis, (wild),
Root of Valerian.	*The Root.*
Veratri Radix,	Veratrum album,
Root of White Hellebore.	*The Root.*
Ulmi Cortex,	Ulmus campestris,
Bark of the Elm.	*The inner bark.*
Uvæ passæ,	Vitis vinifera,
Raisins.	*The dried fruit.*
Uvæ Ursi Folia,	Arbutus Uva Ursi,
Leaves of the Wortleberry.	*The Leaves.*
Zincum,	
Zinc.	
Zingiberis Radix,	Zingiber officinale, ROSCOE, *in Act. Soc. Linn.*
Ginger Root.	*The Root.*

PREPARATIONS & COMPOUNDS.

ACIDS.

ACIDUM ACETICUM DILUTUM.

Diluted Acetic Acid.

Take of Vinegar a gallon;

Let the diluted Acetic Acid distil in a sand bath, from a glass retort into a glass and cooled receiver; then, the first pint being rejected, keep the six pints next distilled.

Malt Vinegar is a mixture of acetic acid, a little alcohol, mucilage, colouring matter, and water, to which the maker is allowed to add one thousandth of its weight of sulphuric acid; by distillation it is rendered colourless and freed from sulphuric acid, but a considerable quantity of mucilage rises in distillation and is condensed with the acetic acid.

The strongest malt vinegar is termed *proof vinegar;* it is estimated to contain 5 per cent of real acetic acid. A fluid-ounce of this vinegar should saturate nearly 65½ grains of crystallized subcarbonate of soda; the same quantity on the addition of muriate of barytes ought not to yield more than 1½ grain of sulphate of barytes. If the vinegar should require a larger quantity of subcarbonate of soda for saturation, it probably contains an excess of sulphuric acid, which may of course be determined by the quantity of sulphate of barytes precipitated.

The specific gravity of acidum aceticum dilutum, or distilled vinegar, obtained from the strongest vinegar, is I find

1.0086; it contains 5 per cent. of acetic acid; a fluidounce requires for saturation 64 grains of crystallized subcarbonate of soda.

The mucilage which rises in distillation with the acid, renders the use of it inconvenient for some purposes, especially in the preparation of certain acetates, that of potash for example. When distilled vinegar is saturated with the alkali, the solution becomes brown and deposits a dark precipitate, derived from the decomposition of the mucilage; this impurity it is difficult and tedious to separate, so as to obtain pure and white acetate of potash.

It is probably on account of the circumstance just mentioned that the College have now introduced acidum aceticum fortius (è ligno destillatum) into the Materia Medica; its specific gravity is stated to be 1.046, and 100 grains are said to saturate 87 of crystallized subcarbonate of soda; when therefore 16 parts by weight of this acid are mixed with 84 parts of water, a diluted acid is obtained, equal in strength to distilled vinegar of specific gravity 1.0086.

The impure acetic acid, called pyroligneous acid, is obtained from the decomposition of wood, by heating it in iron cylinders. It is now prepared in large quantity, and is first purified in a slight degree by simple distillation, which separates a considerable portion of viscid tarry matter; it is then saturated with lime, and the solution when evaporated to dryness, yields an impure acetate of lime, called pyrolignite of lime. This is decomposed in a proper apparatus by sulphuric acid, sulphate of lime remaining in the still, and the acetic acid passing over. Sometimes the pyrolignite of lime is previously decomposed by sulphate of soda, and the resulting acetate of soda, when treated with sulphuric acid, yields acetic acid and sulphate of soda.

Impurities and adulteration of Acetic Acid.—It is difficult entirely to free acetic acid, prepared from wood, from empyreumatic matter; when pure its taste and smell are merely acid, especially after dilution; it should remain colourless when mixed with sulphuric acid, and form a perfectly colourless salt when saturated with potash.

Acetic Acid may be impure from an accidental admixture of sulphurous acid; this, if not detected by the smell, may be discovered by adding a solution of acetate of lead, which will give a white precipitate either with this acid or the sulphuric or muriatic acid. The acid may be adulterated with sulphuric acid; this will be detected by muriate of barytes: if muriatic acid have been mixed with it, nitrate of silver will give a precipitate insoluble in any acid; and, which is less probable, if nitric acid should have been added to it, it

will furnish crystals of nitre when saturated with potash and evaporated.

If acetic acid has been condensed in a metallic worm, it may contain the oxides of tin and lead: the presence of the former may be determined by dropping in a solution of muriate of gold, and of the latter by means of a solution of sulphuretted hydrogen gas, which will afford a dark coloured precipitate if any lead be present. Vinegar which has been distilled in a common still, and condensed in a metallic worm, gives a black precipitate when saturated with ammonia, in preparing the Liquor Ammoniæ Acetatis; with the nature of this precipitate I am unacquainted, but it is probably a compound of some metallic oxide with the mucilage of the vinegar.

Composition of Acetic Acid.—Acetic Acid does not exist uncombined with water or a base. As it occurs in dry acetate of soda or potash, it is composed nearly of

Hydrogen	6	or of,	3 atoms of Hydrogen	1×3=	3
Oxygen	47	....	3 atoms of Oxygen	8×3=	24
Carbon	47	....	4 atoms of Carbon	6×4=	24
	100		Weight of its atom =		51

Fifty-one grains of real acetic acid, saturate 144 grains of crystallized subcarbonate of soda; the strongest which can be procured is solid at about 40° of Fahrenheit, and it is sometimes called glacial acetic acid; it consists of

One atom of acid =	51
One atom of water =	9
Weight of its atom =	60

The following are the preparations in which the diluted and strong acetic acid are employed in the Pharmacopœia:

Acidum Aceticum dilutum.—Liquor Ammoniæ acetatis. Liquor Plumbi subacetatis. Acetum Colchici. Acetum Scillæ. Oxymel Simplex. Oxymel Scillæ.

Acidum Aceticum fortius.—Potassæ Acetas. Plumbi Acetas.

Medicinal Uses.—Acidum Aceticum dilutum is refrigerant, and may be advantageously administered in hæmorrhage; especially in cases where the acetate of lead has been given, since the solubility of this latter substance is increased by it. Externally, it may be a convenient adjunct to lotions containing lead.

ACIDUM BENZOICUM.

Benzoic Acid.

Take of Benzoin a pound;

Put the Benzoin into a glass vessel placed in sand, and a heat of 300° being applied, and gradually increased, sublime until nothing more rises; press that which is sublimed, wrapped in bibulous paper, that it may be separated from the oily part; afterwards again sublime, the heat not being increased above 400°.

Benzoin is a resinous exudation from the *Styrax benzöe* of Sumatra; in the last edition of the Pharmacopœia, benzoic acid was directed to be prepared by boiling the benzoin, reduced to powder, with lime in water; the benzoate of lime obtained was decomposed by muriatic acid, and the benzoic acid thus precipitated was afterwards sublimed. The College have now restored the process of 1787, and this change appears to be advantageous, for according to Brande, the quantity of acid obtainable by sublimation, is greater than that by the rejected process, in the proportion of 96 to 90: added to this it is much less troublesome and expensive.

This process is perfectly simple: the benzoic acid existing in the benzoin is volatilized by a moderate heat, and condenses in the cool part of the apparatus; the oily matter from which it is directed to be separated, is formed by the decomposition of a part of the benzoin, and the fresh arrangement and combination of its elements.

Qualities.—This acid, when pure, is crystallized in soft, colourless, feathery crystals; it is inodorous, although as generally met with it has a slight, but not disagreeable smell, owing to the imperfect separation of the empyreumatic oily matter. Its taste is rather acrid and sour, cold water dissolves it sparingly, it is more readily dissolved by boiling water, and in still greater quantity by alcohol; by exposure to the air the alcohol gradually evaporates, and prismatic crystals of the acid are formed. The aqueous solution reddens litmus paper but slightly, shewing that its acid property is but weak. Its saline compounds are termed benzoates.

Composition.—Benzoic acid is composed of about

Hydrogen	5	or of	6 atoms of Hydrogen	1× 6	= 6
Oxygen	20	....	3 atoms of Oxygen	8× 3	=24
Carbon	75	....	15 atoms of Carbon	6×15	=90
	100		Weight of its atom		= 120

The crystals contain no water.

Officinal Preparation.—Tinctura Camphoræ composita.

Medicinal Uses.—It is supposed to be stimulant and expectorant; but it is rarely used.

ACIDUM CITRICUM.

Citric Acid.

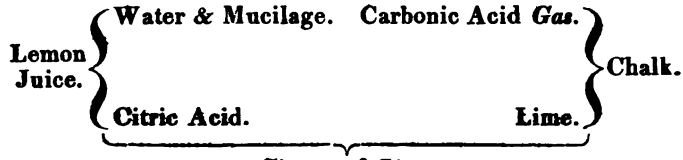
Take of the Juice of Lemons a pint,
Prepared Chalk an ounce, or as much as may be sufficient to saturate the Juice,
Diluted sulphuric Acid nine fluidounces;

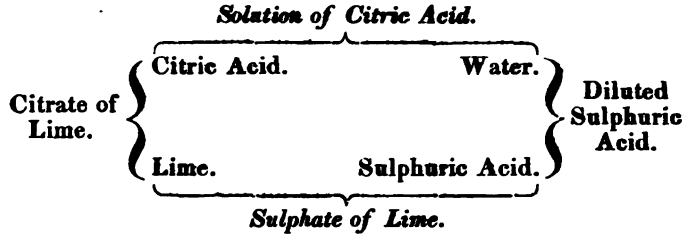
Add the Chalk gradually to the Juice of Lemons made hot, and mix; then pour off the liquor. Wash the Citrate of Lime, which remains, with warm water frequently renewed; afterwards dry it. Then pour the diluted sulphuric Acid upon the dried powder, and boil for ten minutes. Press the liquor strongly through linen, and strain through paper; evaporate the strained liquor with a gentle heat, so that, while it cools, crystals may be formed.

Dissolve the Crystals, that they may be pure, again and a third time in water, and strain it as often, boil down and set it aside.

Process.—Lemon juice is an aqueous solution of citric acid mixed with mucilage, the latter preventing the acid from crystallizing, when the juice is merely evaporated. Chalk consists of carbonic acid and lime, and is termed carbonate of lime; when this is added to lemon juice, the

citric acid, owing to its greater affinity for the lime, combines with it, and expels the carbonic acid in the state of gas. The citrate of lime formed being but slightly soluble, most of it remains undissolved, and the greater part of the mucilage is separated from it with the water. The citrate of lime when heated in diluted sulphuric acid is decomposed, on account of the more powerful affinity of sulphuric, than of citric acid, for lime. The sulphate of lime formed subsides, on account of its insolubility, in the state of a white powder, while the citric acid separated from the lime remains in solution, and by evaporation yields crystals. These operations may perhaps be rendered more intelligible by the annexed diagrams:—



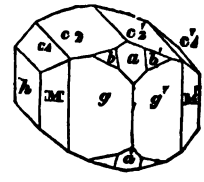


It appears to me that no advantage can be derived from drying the citrate of lime; on the contrary, it is decomposed more readily while moist. Lemon juice probably varies considerably in strength; I found that 100 grains of the fresh juice, of sp. gr. 1.044, decomposed 14.8 grains of crystallized subcarbonate of soda, and as 144 grains of this salt are equivalent to 50 of carbonate of lime, one pint of lemon juice, weighing oz. 15. dr. 6½. will decompose a few grains more than dr. 6½ of chalk; the citrate of lime formed, requires about fluid oz. 5 of diluted sulphuric acid for its decomposition; or for every drachm of chalk used, nearly fl. dr. 6 of the diluted acid must be employed; it is necessary to use this quantity of acid, even supposing any of the chalk to remain undecomposed by the lemon juice. Those who prepare citric acid on the large scale employ chalk which

has been finely powdered, or whiting; it is not requisite that it should undergo the process of elutriation directed by the College.

Qualities.—Citric acid is colourless, inodorous, extremely sour; the primary form of the crystal is a *right rhombic prism*, but which usually exhibits the planes described in the annexed figure: M and M′ being the lateral primary planes.

M	on M′	101°	30′
M	on *h*	129	15
M	on *g*	163	23
g	on *g*′	134	45
a	on *a*′	111	50
a	on *b*	161	30
h	on c_1	139	45
h	on c_2	121	15
c_1	on c_2	161	30
c_2	on c'_2	117	30



By exposure to a damp atmosphere the crystals absorb moisture. An ounce of water at the temperature of 60°, dissolves about dr. 10 of crystallized citric acid, and when boiling, nearly twice its weight. The solution, like lemon juice, decomposes and becomes mouldy by keeping. One drachm of the crystals of this acid saturate very nearly two drachms of crystallized subcarbonate of soda. Nine drachms and a half of citric acid, dissolved in a pint of distilled water, give a solution equal in strength to lemon juice.

The following table exhibits the equivalent proportions of crystallized citric acid, lemon juice, and solution of citric acid prepared as above, necessary for the decomposition of alkaline salts named:—

A Scruple of	*Lemon Juice or Solution of Citric Acid.*	*Citric Acid.*
Carbonate of Potash	f ʒ iijss	gr. 15
Subcarbonate of Potash	f ʒ iiij	gr. 18
Subcarbonate of Ammonia	f ʒ vi	gr. 26

It is to be observed that in the above statements the carbonate of potash is considered as crystallized; the subcarbonate as dry, but containing as it usually does, about 16 per cent. of water, and the subcarbonate of ammonia as

semitransparent and moderately hard; if it be opaque and powdery, the change is owing to the loss of ammonia, its saturating power is consequently diminished, and to an uncertain extent.

Composition.—Citric acid, like the acetic, is a compound of oxygen, hydrogen, and carbon. The proportions are, probably, as follows:—

Oxygen....55.18	or	Oxygen.. 4 atoms	8×4=32
Hydrogen.. 3.44		Hydrogen 2 ditto	1×2= 2
Carbon 41.38		Carbon .. 4 ditto	6×4=24
100.00		Weight of atom	=58

In the crystallized state it appears to consist of

Citric acid 76.32	or	1 atom acid..	=58
Water 23.68		2 atoms water	9×2=18
100.00		Weight of atom	=76

Incompatibles.—Citric acid is incompatible with all alkaline solutions and substances, converting them into citrates, as ammonia, potash, soda, lime, magnesia, barytes, &c. It decomposes the alkaline, earthy, and metallic carbonates, most acetates, the alkaline sulphurets and soaps. It is also incompatible with tartrate of potash, which it converts into citrate and supertartrate of potash.

Adulteration.—If it be mixed with any crystallized sulphate, or if it retain any accidental portion of sulphuric acid, the solution will give a precipitate with muriate of barytes, which is insoluble in muriatic acid. Tartaric acid being cheaper than citric, the former may be mixed with or substituted for the latter; tartaric acid will be detected by mixing a solution of the suspected acid with one of nitrate, muriate or sulphate of potash; if minute crystals be deposited, we may conclude that the acid in question contained tartaric acid, or consisted of it. This may be confirmed by saturating a little of the suspected acid with solution of potash, and boiling it with a dilute solution of muriate of platina; if tartaric acid be present, a black precipitate of protoxide of platina will be formed.

Medicinal Uses.—It is employed as a refrigerant, combined with potash or ammonia in the proportions already stated. Half an ounce of lemon juice thus saturated is generally esteemed a dose.

ACIDUM SULPHURICUM DILUTUM.

Diluted Sulphuric Acid.

Take of Sulphuric Acid a fluidounce and a half,
Distilled Water fourteen fluidounces and a half; add the Acid to the Water gradually; then mix.

Dry Sulphuric Acid, sometimes called anhydrous or real sulphuric acid, to distinguish it from the liquid acid which contains water, is composed of

Sulphur....40	or of	1 atom of Sulphur	=16
Oxygen....60		8 atoms of Oxygen.... 8×3	=24
100		Weight of its atom	=40

Liquid Sulphuric Acid, most frequently termed, as in the Pharmacopœia, merely sulphuric acid, and often oil of vitriol, consists of

Dry Sulphuric Acid..81.6	or	1 atom of dry acid	=40
Water.....18.4		1 atom of water ..	= 9
100.0		Weight of its atom	=49

The specific gravity of liquid sulphuric acid at 60° of Fahrenheit is to that of water as 1.8485 to 1.000; if it exceed this its usual purity may be questioned; generally however it is only about 1.8433 and then it is constituted very nearly of

Dry Sulphuric Acid..78	or	4 atoms of dry acid	=160
Water.....22		5 atoms of water ..	= 45
100			205

My future observations will in general apply to acid of this density. Liquid sulphuric acid is colourless, transparent, inodorous and of an oily consistence; it is highly acrid and corrosive; its acid properties are extremely strong, so that a single drop gives to a large quantity of water the power

of reddening vegetable blue colours; but when undiluted it has the property of turning vegetable yellow colours brown, as the alkalies do. Its boiling point is about 545°, and it solidifies at 15° below zero.

Sulphuric acid has great affinity for water. By exposure to the air, in an open vessel, it imbibes one-third of its weight in 24 hours, and more than six times its weight in a twelvemonth. When one part of water is suddenly mixed with four times its weight of concentrated sulphuric acid, both at the temperature of 50°, it is raised to 300°; but, according to Dr. Ure, the greatest heat is excited by mixing 73 parts of acid with 27 of water. The mixture of sulphuric acid and water always occupies less space than before combination, and the last-mentioned proportions more especially, for the highest temperature is always succeeded by the greatest condensation.

Concentrated sulphuric acid acts very slowly upon the metals at ordinary temperatures; but at a boiling heat many of them decompose it, and are oxidized by combining with a portion of its oxygen, while sulphurous acid is given out in the gaseous state. When diluted, it readily dissolves those metals which decompose water by its agency, with the evolution of hydrogen gas, as iron and zinc; and it dissolves the oxides of most other metals. It readily combines with the alkalies and earths, and forms with them various important salts.

Most vegetable and animal substances, on account of the carbon they contain, decompose and are decomposed by sulphuric acid; and this renders the acid of a dark colour. Although sulphuric acid ought certainly to be colourless, yet the slight colour which it often acquires from the circumstance just mentioned, does not materially deteriorate its quality or reduce its strength.

Sulphuric acid acts upon alcohol; and the nature of the product depends upon the relative proportions employed. If three measures of the acid be heated in a retort, with one measure of alcohol, bicarburetted hydrogen gas is very plentifully evolved; but when the proportions are one measure of acid to two measures of alcohol, then sulphuric æther is formed.

Medicinal Uses.—It possesses the refrigerant and antiseptic virtues common to other acids; and it has astringent properties that render it a most valuable medicine in weakness and relaxation of the digestive organs, in colliquative sweats and in internal hæmorrhage. A fluidrachm of the Acidum sulphuricum dilutum contains about 10 grains of the strong acid, and will saturate 28 grains of crystallized

subcarbonate of soda. Dose ♏ x. to xl. Vide Infusum Rosæ.

Pharmaceutical Uses.—Sulphuric Acid enters into the composition of Infusum Rosæ, Potassæ Sulphas and Supersulphas, Sodæ Sulphas, Ferri Sulphas and Zinci Sulphas. It is employed in preparing Acidum Citricum, Muriaticum Nitricum and Tartaricum, Æther Sulphuricus, Antimonii Sulphuretum Præcipitatum, Hydrargyri Oxymurias and Submurias, Potassæ and Sodæ Carbonas.

Incompatibles.—All substances that combine with this acid are of course incompatible with it; such, as already mentioned, are most of the metals, their oxides, some of the earths, their carbonates, and the alkaline carbonates. The solutions of acetate of lead and of muriate of lime, are decomposed by it, white precipitates of sulphate of lead and sulphate of lime being obtained. Its presence is detected by the action of barytic salts, with the base of which it forms sulphate of barytes, soluble only in concentrated sulphuric acid.

Adulteration.—Sulphuric acid always contains sulphate of lead, derived from the chambers in which it is manufactured, and some sulphate of potash: they generally amount to about ¼ of a grain per cent. When water is added to the acid, the sulphate of lead is precipitated in the state of white insoluble powder, from which the diluted acid should be poured off for use. If sulphate of potash should be fraudulently mixed with the acid, for the purpose of increasing its specific gravity, the best method of detecting it is to saturate the acid with ammonia, and expel the sulphate of ammonia formed, by putting it into a crucible and subjecting it to a red heat;—the sulphate of potash will remain in the crucible.

ACIDUM MURIATICUM.

Muriatic Acid.

Take of Muriate of Soda, dried, two pounds,
Sulphuric Acid, *by weight*, twenty ounces,
Distilled Water a pint and a half;

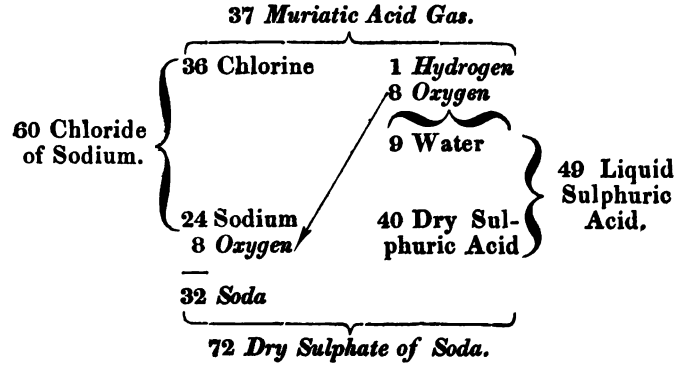
First mix the Acid with half a pint of the Water in a glass retort, and to these, when cooled, add the Muriate of Soda.

Pour what is left of the water into a receiver; then, the retort being fitted to it, let the muriatic Acid, distilled from a sand bath, pass over into this water, the heat being gradually increased, until the retort becomes red.

The specific gravity of muriatic Acid is to the specific gravity of distilled Water as 1.160 to 1.000.

One hundred and twenty-four grains of the Crystals of Subcarbonate of Soda, are saturated by 100 grains of this acid.

Process.—Common salt, or chloride of sodium, is a compound of 36 chlorine and 24 of the metallic body sodium; liquid sulphuric acid, of the greatest density, consists of 40 parts of dry acid and 9 of water, the water being composed of 1 of hydrogen and 8 of oxygen; when these quantities of common salt and liquid sulphuric acid act upon each other, the water and chloride of sodium are both decomposed; the 1 of hydrogen uniting with 36 of chlorine constitute 37 of muriatic acid gas, and the 8 of oxygen with the 24 of sodium form 32 of oxide of sodium or soda. The 37 of muriatic acid gas combining with the water used in diluting the acid, rise with it in the state of vapour, and by condensation in the receiver, liquid muriatic acid is produced; the 40 parts of dry sulphuric acid uniting with the 32 of soda, form 72 of dry sulphate of soda, which remain in the retort.



In preparing this acid, it is more convenient to mix the sulphuric acid and water in a separate vessel, than in the

retort; to introduce the salt first into the retort and to pour the acid upon it.

Composition.—Muriatic acid gas is composed of equal volumes of hydrogen gas and chlorine gas; and the combination takes place without alteration of volume. By weight it consists nearly of

Hydrogen 2.7	or 1 atom of Hydrogen....	= 1
Chlorine 97.3	1 ditto of Chlorine	= 36
100.0	Weight of its atom	= 37

Qualities.—Muriatic acid, when perfectly pure, is colourless; it emits white suffocating fumes, which turn vegetable blues red, its taste is strongly sour and acrid; when its sp. gr. is 1.160 as directed by the College, it contains nearly 32.4 per cent. of Muriatic acid gas, and a fluidounce weighs about 527 grains; it is stated that 100 grains saturate 124 of crystallized subcarbonate of soda, which, from some indirect experiments, I believe is very nearly correct. By the French chemists it is termed hydrochloric acid, to express its nature. It acts upon and dissolves several metals with the evolution of hydrogen gas arising from the decomposition of water. Thus iron, zinc, and tin, are readily dissolved by it; it acts but slowly upon copper, but dissolves its oxides with facility. Its saline compounds are termed muriates, and most of them exist as such only in solution, and they suffer by evaporation to dryness and heating a decomposition, the nature of which I shall explain when describing the properties of muriate of lime.

Adulteration.—This acid, as usually met with, has a yellow tinge, which is owing either to the presence of chlorine or of peroxide of iron; if the former be present, it may sometimes be determined by the smell, or by its power of dissolving gold leaf; the latter is detected by the addition of solution of ammonia, which, when added slightly in excess throws down the peroxide of iron of a reddish yellow colour. It sometimes also contains sulphuric acid; this is discoverable by adding a solution of muriate of barytes to a portion of the acid diluted with 4 or 5 parts of distilled water. This dilution is requisite, because the acid, when concentrated, attracts the water from the solution of muriate of barytes, and causing it to crystallize, gives a fallacious appearance of the presence of sulphuric acid.

Incompatibles.—This acid is incompatible with alkalies, most earths, oxides, and their carbonates; sulphuret of pot-

ash, tartrate of potash, tartarized antimony, tartarized iron, nitrate of silver, and solution of subacetate of lead.

Officinal Preparations.—Ferrum Ammoniatum. Tinctura Ferri Muriatis.

Medicinal Uses.—According to Dr. Paris, it may be advantageously employed in malignant cases of scarlatina and typhus, and mixed with a strong infusion of quassia, he considers it to be the most efficacious remedy for preventing the generation of worms. Dose ♏ v.—xx. frequently repeated.

ACIDUM NITRICUM.

Nitric Acid.

Take of Nitrate of Potash, dried,

Sulphuric Acid, each, *by weight*, two pounds;

Mix in a glass retort, then let the nitric Acid distil in a sand bath, until a red vapour appears. Afterwards, an ounce of dried Nitrate of Potash being added, let the Acid distil again in the same manner.

The specific gravity of nitric Acid is to the specific gravity of distilled Water, as 1.500 to 1.000.

Two hundred and twelve grains of the Crystals of Subcarbonate of Soda are saturated by 100 grains of this Acid.

Process.—The quantities of nitrate of potash and *densest* sulphuric acid directed to be used, are nearly in the proportion of one atom of the salt and two atoms of the acid; and if we employ sulphuric acid of specific gravity 1.8433, which, as already noticed, is more commonly met with, the atomic proportions are still more nearly those stated, or what is equivalent, we may consider two atoms of the salt and four atoms of the acid as submitted to distillation, which will be more convenient in explanation.

Two hundred and four parts of nitrate of potash, are composed of 108 of dry nitric acid and 96 of potash; 205 parts of sulphuric acid consist of 160 of dry acid and 45 of water. When 204 of the salt and 205 of the acid are mixed and heated, double decomposition occurs;—the 96 of potash=2

from all admixture except a little nitrous acid, which, as already noticed, is quite unimportant. The impurities usually occurring in the nitric acid of the shops, are the sulphuric and muriatic acids. The former is detected by muriate or nitrate of barytes, after diluting the acid with 5 or 6 times its quantity of water. This dilution is requisite, for a reason already stated, when treating of muriatic acid. If muriatic acid be present, it is immediately discovered by adding a solution of nitrate of silver to the diluted acid, this occasioning a white precipitate of chloride of silver.

Incompatibles.—It has been before observed, that, when moderately diluted, this acid is readily decomposed by most metals; but it has no action upon platina or gold, and they, of course, do not decompose it. When mixed with muriatic acid, both suffer decomposition, and chlorine and nitrous acid result. The mixture is called aqua regia and nitro-muriatic acid, and it possesses the power of dissolving both platina and gold. The action of combustible bodies upon this acid has been adverted to. It is incompatible with sulphate of iron, the protoxide of which decomposes it, and combining with its oxygen, becomes peroxide, and the colour of the solution of iron changes from blueish green to yellowish red. It acts strongly upon spirit of wine, and by their mutual decomposition nitric æther is formed. Oxides, earths, alkalies, and their carbonates, are incompatible with this acid, and sulphurets are decomposed by it. It decomposes the solution of acetate of lead and acetate of potash, expelling the acetic acid, and forming nitrate of lead and nitrate of potash.

Pharmaceutic Uses.—Nitric acid is employed in several preparations; as, Argenti Nitras, Liquor Ferri Alkalini, Hydrargyri Nitrico-oxydum, Spiritus Ætheris Nitrici, and Unguentum Hydrargyri nitratis. It is sometimes employed externally as an escharotic. For other medicinal uses, see Diluted Nitric Acid.

ACIDUM NITRICUM DILUTUM.

Diluted Nitric Acid.

Take of Nitric Acid a fluidounce,
Distilled Water nine fluidounces;
Mix.

Composition.—One hundred grains of this diluted acid contain 14.3 of the concentrated acid, and consequently saturate about 30½ grains of crystallized subcarbonate of soda; by weight, therefore, their respective strengths are to each other almost exactly as 1 to 7: the specific gravity of the diluted acid is 1.080, and each fluidrachm contains nearly 9 grains of the concentrated acid, saturating 19 grains of crystallized subcarbonate of soda.

Medicinal Use.—This acid is a very powerful antiphlogistic remedy, and is probably serviceable in restraining the progress of syphilis, when an impaired constitution or other circumstances render the exhibition of mercury improper. If sufficiently diluted, it forms an excellent lotion for old indolent ulcers. It is expectorant, and is occasionally used with success in counteracting the consecutive effects of opium. Dose ♏ x. to xl.

ACIDUM TARTARICUM.

Tartaric Acid.

Take of Supertartrate of Potash two pounds and a half,
Boiling distilled Water three gallons,
Prepared Chalk a pound,
Sulphuric Acid a pound;

Boil the Supertartrate of Potash with two gallons of the distilled Water, and add gradually the prepared Chalk, until bubbles are no longer excited; set by [the mixture], that the Tartrate of Lime may subside; pour off the liquor, and wash the Tartrate of Lime frequently with distilled water, until it is free from taste. Then pour upon it the sulphuric Acid, diluted with a gallon of boiling distilled Water, and set it by for twenty-four hours, frequently stirring it. Strain the liquor, and evaporate it in a water bath, that crystals may be formed.

Tartar, cream of tartar, or supertartrate of potash, called in correct terms bitartrate of potash, is a well known acidu-

lous salt deposited from wine. It occurs in the state of small crystals, the form of which I shall give in a succeeding page. Water dissolves it very sparingly; but the solution reddens litmus paper.

Composition.—This salt is composed of tartaric acid and potash, the former being in sufficient quantity to saturate twice the actual quantity of the latter; and hence it is termed bitartrate of potash. It consists of

Tartaric acid	70 or	2 atoms of tartaric acid ..	66×2=132
Potash	25.4	1 atom of potash	= 48
Water	4.6	1 atom of water	= 9
	100.0	Weight of the atom	=189

Process.—The excess of tartaric acid decomposes the carbonate of lime, carbonic acid being evolved in the gaseous state, and tartrate of lime is precipitated, owing to its insolubility. The bitartrate of potash thus losing one half of its acid, is reduced to the state of simple tartrate, and remains in the solution from which the tartrate of lime separates.

Bitartrate of Potash. { Tartrate of Potash, Carbonic Acid *Gas.* } Chalk or Carbonate of Lime.
{ Tartaric Acid, Lime }

Tartrate of Lime.

The tartrate of lime thus formed, when mixed with diluted sulphuric acid, is decomposed, owing to the superior affinity of the sulphuric acid for lime, and the sulphate of lime precipitating, the tartaric acid remains in solution:

Solution of Tartaric Acid.

Tartrate of Lime. { Tartaric Acid, Water, Lime, Sulphuric Acid } Diluted Sulphuric Acid.

Sulphate of Lime.

In the process adopted by the College only one half of the tartaric acid is procured; but in order to prevent waste, the solution remaining after the formation of the tartrate of lime, should be evaporated to obtain crystals of tartrate of potash. (Vide Potassæ Tartras.) The excess of tartaric acid in the

30 ounces of the supertartrate, directed by the College, amounts to 10½ ounces, requiring nearly 8 oz. of carbonate of lime (chalk or whiting) for their conversion into tartrate of lime, and the tartrate of lime obtained, must be decomposed by 8 oz. 3 dr. by weight, of sulphuric acid, diluted with water.

Qualities.—Tartaric acid is colourless, inodorous, and very sour to the taste; it occurs in crystals of considerable size, the primary form of which is *an oblique rhombic prism.*

Fig. 1 exhibits the crystal as usually modified, with the planes symmetrically placed. Fig. 2 exhibits the same modified form, with the planes irregularly disposed, as they appear in most of the crystals, the corresponding planes in both being marked with the same letters. This affords another instance of irregularity, which renders it not easy immediately to perceive the relations of the several planes to each other.

Fig. 1.

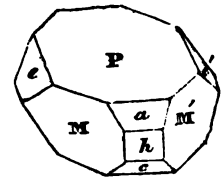
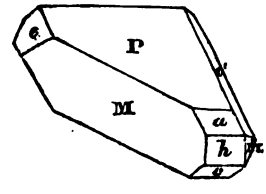


Fig. 2.



P on M, or M'	97°	10'
M on M'	88	30
P on *e* or *e'*	128	15
P on *a*	134	50
P on *h*	100	47

Tartaric acid does not deliquesce when exposed to the air, water at 60° dissolves about one fifth of its weight of it, and boiling water much more; the solution acts strongly upon vegetable blue colours, and becomes mouldy by keeping. At a high temperature tartaric acid is decomposed; sulphuric acid and nitric also decompose and are decomposed by it; and the carbon of the tartaric acid, or a portion of it, combining with an additional portion of oxygen derived from the nitric acid, it is converted into oxalic acid.

Supertartrate of potash when moistened with water, and tartaric acid when dissolved in it, readily act upon and dissolve those metals which decompose water, such as iron and zinc; the supersalt and acid also combine with the oxides of most other metals, the alkalies, and with many of the earths; they both decompose the alkaline and earthy carbonates, as subcarbonate of potash and of soda, carbonate of lime, &c.

Composition.—Tartaric acid uncombined with water is composed of

Oxygen..	60.6	or 5 atoms of oxygen	..8×5=40
Hydrogen	3.0	2 atoms of hydrogen	1×2= 2
Carbon ..	36.4	4 atoms of carbon	..6×4=24
	100.0	Weight of its atom	=66

In the state of crystals the acid consists of

Dry acid	88.16	or 1 atom of acid	=66
Water..	11.84	or 1 atom of water	= 9
	100.00	Weight of its atom	=75

The saturating power of crystallized tartaric acid is to that of crystallized citric acid as 75 to 76, or 75 grains of the former and 76 of the latter, saturate 144 grains of crystallized subcarbonate of soda.

Incompatibles.—Tartaric acid, as already noticed, combines with alkalies and decomposes their carbonates; its effects are similar upon most earths and their carbonates, and it is therefore incompatible with them. It decomposes the salts of potash, when in solution, converting them into bitartrate, which is quickly deposited in minute crystals; it also gives immediate precipitates with the salts of lime and of lead.

Adulteration.—If the acid have been carelessly prepared, it may then contain sulphuric acid in a state of mixture; this will be immediately detected, by the solution affording, with muriate of barytes, a precipitate insoluble in excess of muriatic acid.

Medicinal Uses.—This acid being cheaper than citric acid, it is sometimes employed instead of it, especially in preparing what are called sodaic powders, used as substitutes for soda water. Supertartrate of potash is employed in the Pharmacopœia in preparing Potassæ Tartras, Soda Tartarizata, and Antimonium Tartarizatum.

ALKALIES AND THEIR SALTS.

LIQUOR AMMONIÆ.

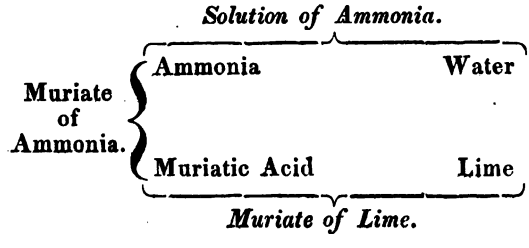
Solution of Ammonia.

Take of Muriate of Ammonia eight ounces,
Fresh Lime six ounces,
Water four pints;

Pour a pint of the Water upon the Lime; then cover the vessel and set it aside for an hour; afterwards add the Muriate of Ammonia, and the remaining Water, first made hot, and cover the vessel again; strain the liquor after it has cooled; then let twelve fluidounces of the Solution of Ammonia distil into a receiver, the heat of which does not exceed 50°.

The specific gravity of Solution of Ammonia is to the specific gravity of distilled Water as 0.960 to 1.000.

Process.—Muriate of ammonia, frequently called sal ammoniac, is a compound of muriatic acid and ammonia or the volatile alkali; when mixed with lime it is decomposed on account of the stronger affinity of muriatic acid for lime than for ammonia; until the strained liquor is subjected to distillation, it contains ammonia and muriate of lime, with some excess of the earth; when it is heated in the retort, the ammonia, being volatile, rises in the gaseous state, in combination with the vapour of the water, and they are together condensed in the receiver and form solution of ammonia. The muriate of lime, not being volatile, remains with a part of the water in the retort.



Ammoniacal gas is transparent, colourless, and of course invisible. Its smell is extremely pungent, and its taste acrid. Its sp. gr. compared with atmospheric air is as 0.5931 to 10.000, and 100 cubic inches weigh 18.08 grains. An animal immersed in it is quickly killed; it extinguishes flame, but a taper is enlarged in it before it goes out. It is very rapidly condensed by water, the solution is colourless and transparent, and like the gas possesses properties which are most strongly alkaline, turning vegetable yellow colours brown, blues green, and by combining with acids it destroys their power of reddening vegetable blue colours. When subjected to a pressure of about 6.5 atmospheres at the temperature of 50°, ammoniacal gas was found by Mr. Faraday to become a colourless transparent fluid, having a sp. gr. of 0.760. The aqueous solution decomposes by exposure to the air, and still more readily by heat, the ammonia being dissipated in the elastic or gaseous form. When ammoniacal gas is mixed with oxygen gas, and fired by the taper, water is formed, and azotic gas left, and by being passed through a red hot tube, it is resolved into hydrogen gas and azotic gas.

Composition.—Ammoniacal gas is composed of 3 volumes of hydrogen gas and 1 volume of azotic gas, condensed into 2 volumes, or by weight it is composed of

Hydrogen	17.64	or 3 atoms of hydrogen	$1\times3=3$
Azote	82.36	1 atom of azote	$=14$
	100.00	Weight of its atom	$=17$

A solution of sp. gr. 0.960, directed in the Pharmacopœia, is composed very nearly of

Ammoniacal gas	10
Water	90
	100

Incompatibles.—Liquor Ammoniæ is incompatible with acids, acidulous and most earthy and metallic salts, but it does not decompose the salts of lime, barytes or strontia, those of magnesia only partially, and tartarized iron is not at all precipitated by it.

Adulteration.—The only adulteration or rather imperfection to be suspected in solution of ammonia, is a slight admixture

of carbonate of ammonia; this will readily be detected by pouring it into lime water; if carbonate of ammonia be present, carbonate of lime will be precipitated, otherwise the mixed solutions will remain transparent.

Officinal Preparations.—Linimentum Ammoniæ, Spiritus Ammoniæ Succinatus, Linimentum Camphoræ compositum, Linimentum Hydrargyri.

Medicinal Uses.—Liquor Ammoniæ is stimulant, rubefacient, and antacid; it may be exhibited in milk, water, or any cold liquid which is not incompatible with it. Dose ♏ x. to ♏ xxx. If it should be swallowed by mistake, the best antidote is vinegar or lemon juice.

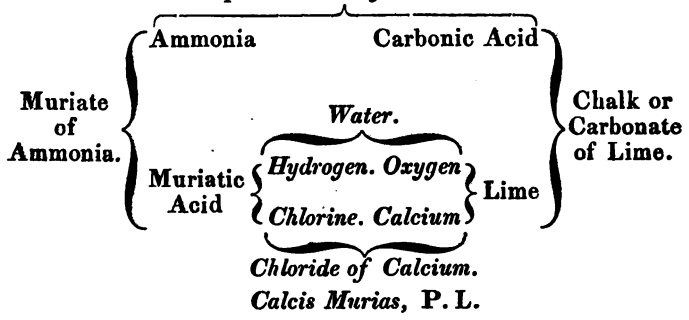
AMMONIÆ SUBCARBONAS.

Subcarbonate of Ammonia.

Take of Muriate of Ammonia a pound,
Prepared Chalk, dried, a pound and a half;
Rub them separately to powder; then mix and sublime, the heat being gradually increased until the retort becomes red.

Process.—Muriate of Ammonia consists of muriatic acid and ammonia, and chalk is composed of carbonic acid and lime; but muriatic acid is a compound of chlorine and hydrogen, and lime of the metallic body calcium, and oxygen. When these substances act upon each other, the muriate of ammonia and the carbonate of lime are not only decomposed, but the muriatic acid and the lime also; the hydrogen of the former and the oxygen of the latter combine, and form water, which rises in vapour and is condensed with the carbonate of ammonia, while the chlorine of the muriatic acid uniting with the calcium of the lime, they form chloride of calcium, which remains in the vessel unacted upon by the heat; this compound was formerly called Muriate of Lime, and it still, but improperly, retains that name in the Pharmacopœia. (Vide Calcis Murias.)

Ammoniæ Subcarbonas, P. L.
Sesquicarbonate of Ammonia.



Qualities.—When recently prepared, subcarbonate of ammonia is a colourless translucent mass of a striated crystalline appearance, and it is moderately hard. Its smell is pungent, and its taste sharp and penetrating; turmeric paper, when held over it is turned of a reddish brown colour by the carbonate of ammonia which escapes. It is soluble in about four times its weight of cold water, and by hot water it is decomposed with effervescence. When the bottle which contains this salt, is frequently opened, or if a small quantity of it be kept in a large bottle, it gradually becomes opaque and friable, and its pungency is much diminished; if it be exposed to the air for some time, it is rendered quite devoid of smell, owing to the volatilization of ammonia, combined with a smaller quantity of carbonic acid, than exists in the inodorous salt.

Composition.—This salt consists, in its perfect state, of

Carbonic acid	55.93	or 3 atoms of carbonic acid	22×3= 66
Ammonia ..	28.81	2 atoms of ammonia ..	17×2= 34
Water	15.26	2 atoms of water	9×2= 18
	100.00	Weight of its atom	=118

Or in stating the nature of this salt, we may consider it either as a sesquicarbonate, composed of 1½ proportion of acid and 1 of base, or as constituted of an atom of carbonate of ammonia combined with one atom of bicarbonate and two atoms of water: and it is evident that the name of *subcarbonate*, although it may be meant to express its alkaline properties, does not convey an accurate idea of its nature. If we view it as composed of carbonate and bicarbonate, it will appear by calculation, that during its preparation an atom of

ammonia has escaped. By exposure to the air it is rendered quite inodorous as already mentioned, because the whole of the carbonate of ammonia flies off, leaving only the bicarbonate and water, and is then composed of

Carbonic acid	55.70	or 2 atoms of carbonic acid	22×2=44
Ammonia ..	21.52	1 atom of ammonia	=17
Water	22.78	2 atoms of water	9×2=18
	100.00	Weight of its atom	=79

Incompatibles.—Subcarbonate of ammonia is decomposed by acids, by potash and soda, and their subcarbonates, lime, lime water, solution of muriate of lime, magnesia, alum, acidulous salts, as supertartrate and supersulphate of potash, and solutions of iron, except the tartarized iron; oxymuriate of mercury, the acetate and subacetate of lead, sulphate of iron and of zinc, are also incompatible with this salt. With sulphate of magnesia it affords no precipitate and probably none with the alkaline solution of iron; but with the first it unites to form a double salt, and perhaps converts the subcarbonate of potash of the latter compound into carbonate by yielding its carbonic acid.

Officinal Preparations.—Liquor Ammoniæ Subcarbonatis, Liquor Ammoniæ Acetatis, Linimentum Ammoniæ Subcarbonatis, Cuprum Ammoniatum.

Medicinal Uses.—It is stimulant, antispasmodic, diaphoretic, powerfully antacid, and in large doses emetic. In the form of smelling salts it is useful in syncope and hysteria. It must not be kept in powdered mixtures, and although in the form of pill its properties are longer retained, it is by no means an eligible mode of exhibiting it. Dose, gr. v. to xx: xxx grains are emetic.

LIQUOR AMMONIÆ SUBCARBONATIS.

Solution of Subcarbonate of Ammonia.

Take of Subcarbonate of Ammonia four ounces,
Distilled Water a pint;

Dissolve the Subcarbonate of Ammonia in the Water, and strain through paper.

This solution ought not to be prepared in large quantities at a time, for by keeping, or rather by the occasional exposure to air, its pungency and powers suffer diminution. Dose, ♏ xxx to ʒj. in any bland liquid. This solution is of course incompatible with the substances already named as such with the subcarbonate of ammonia.

LIQUOR AMMONIÆ ACETATIS.

Solution of Acetate of Ammonia.

Take of Subcarbonate of Ammonia two ounces,
Diluted Acetic Acid four pints, or as much as may be sufficient;
Add the acid to the Subcarbonate of Ammonia, until bubbles are no longer excited, and mix.

Process.—This is a case of single elective affinity and decomposition. In preparing this solution, carbonic acid gas is evolved owing to the stronger affinity of the acetic acid for the ammonia with which it was combined, and acetate of ammonia is formed and remains in solution. Four pints of the diluted acetic acid of sp. gr. 1.0086 will require nearly 3½ oz. of subcarbonate of ammonia for saturation; if the subcarbonate of ammonia have become opaque by exposure to the air, its quantity must be increased; the best method is to add the alkaline salt to the acetic acid, and to examine the state of saturation with turmeric and litmus paper; it is better that the acid should appear to be in excess, for the carbonic acid which remains for some time in solution, and which seems to indicate excess of acetic acid, is eventually dissipated; it is owing to the presence of this acid that solution of acetate of ammonia, when mixed with that of subacetate of lead, often gives a white precipitate of carbonate of lead, and a fallacious appearance of the presence of sulphuric acid in the distilled vinegar. It has been already stated that vinegar which has been condensed in a metallic worm, affords a dark coloured precipitate when used in preparing solution of acetate of ammonia.

Incompatibles.—Acids; potash, soda and their carbonates; lime water, magnesia, sulphate of magnesia, corrosive subli-

mate, sulphate of iron, copper, and zinc, and nitrate of silver; the acetate and subacetate of lead also, on account of the carbonic acid which the Liquor Ammoniæ Acetatis contains, are incompatible with it.

Medicinal Uses.—This preparation is not unfrequently employed as a collyrium, in which case it is especially requisite that there should be no excess of subcarbonate of ammonia. When assisted by warmth and plentiful dilution, it is an excellent diaphoretic, and in some cases it acts as a diuretic. Dose f℥ii. to f℥vi. Externally as a lotion it is refrigerant.

POTASSÆ SUBCARBONAS.

Subcarbonate of Potash.

Take of Impure Potash, bruised, three pounds,
Boiling Water three pints and a half;

Dissolve the Potash in the Water and strain; then pour off into a clean iron vessel, and evaporate the Water with a slow fire, that the Liquor may thicken; afterwards, the fire being removed, stir constantly with an iron spatula until the Salt passes into small grains.

Subcarbonate of Potash may be prepared in the same manner from Tartar, which has first been burnt, until it is of an ash colour.

Process.—By "impure potash" it is presumed that the College mean the impure subcarbonate of potash, called *pearlash;* this consists of subcarbonate of potash, mixed with various saline and some earthy substances. By solution in water the greater proportion of the impurity is removed, but it is better to use cold than the hot water directed by the College, and in smaller quantity.

Iron vessels are, I believe, rarely employed, for the rust which they so speedily acquire would injure the colour of the salt; copper vessels are generally preferred, and are used without inconvenience; it is requisite also to keep the subcarbonate of potash over the fire until it becomes per-

fectly dry, otherwise it will scarcely be sufficiently deprived of moisture to granulate.

Qualities.—This salt is colourless and inodorous, its taste is strong and disagreeable; it does not readily crystallize and is never kept in crystals; it is deliquescent, attracting in a short time enough water from the atmosphere to become fluid; water dissolves an equal weight of it, and any residue may be considered as impurity. The solution turns vegetable blues green, and yellows brown; it is insoluble in alcohol.

Composition.—When perfectly pure it is composed of

Carbonic acid ..	31.43	or 1 atom of carbonic acid ..	=22
Potash	68.57	1 atom of potash	=48
	100.00	Weight of its atom	=70

As this salt consists of one atom of each of its constituents, its proper appellation is *carbonate* of potash, but on account of its alkaline properties it has long been termed a subcarbonate. The weight lost by exposure to a red heat shows the quantity of water it contains, which is usually about 16 per cent. it appears therefore to be a sesquihydrate, composed of nearly

Carbonate of Potash	84	or 1 portion of carbonate of potash	70
Water	16	1½ portion of water	13.5
	100		83.5

Impurities.—The impurities of this salt are generally some earthy matter, with a small portion of sulphuric and muriatic salts, amounting to about 3 per cent. this admixture is quite unimportant in a medicinal point of view. The proportion of these impurities may however be greater, and it may be determined by saturating a solution of 100 grains of the subcarbonate with nitric acid, and adding solution of nitrate of barytes to one half of it, and nitrate of silver to the other; if the quantity of sulphate of barytes and chloride of silver obtained do not exceed one grain each, the preparation may be considered as sufficiently pure.

Incompatibles.—Acids and acidulous salts, muriate of ammonia, acetate of ammonia, lime water and muriate of lime, sulphate of magnesia, alum, tartarized antimony, nitrate of silver, ammoniated copper, ammoniated iron and its tincture, sulphate of iron, tincture of muriated iron, calomel and corrosive sublimate, acetate and subacetate of lead, sulphate

of zinc. It does not decompose solution of tartarized iron, unless they are heated together.

Officinal Preparations and Uses.—Liquor Potassæ Subcarbonatis, Liquor Potassæ, Potassæ acetas, Potassæ Sulphas, Potassæ Tartras, Magnesiæ Subcarbonas, Potassæ Sulphuretum, Alcohol, Liquor Arsenicalis, Liquor Ferri Alkalini, Hydragyrum Præcipitatum Album, Spiritus Ammoniæ and Spiritus Ammoniæ Aromaticus, Decoctum Aloës Compositum, Mistura Ferri Composita, Pilulæ Ferri Compositæ.

Medicinal Uses.—Antacid and diuretic. Dose from gr. x. to gr. xxx. It is far less pleasant than the carbonate. It is principally used for making saline draughts.

LIQUOR POTASSÆ SUBCARBONATIS.

Solution of Subcarbonate of Potash.

Take of Subcarbonate of Potash a pound,
Distilled Water twelve fluidounces;
Dissolve the Subcarbonate of Potash in the Water, and strain through paper.

Qualities.—This solution of subcarbonate of potash has a specific gravity of 1.446. It is a colourless inodorous solution, the dose of which is from ♏ x. to f℥i. Its incompatibles and pharmaceutic uses are enumerated above.

POTASSÆ CARBONAS.

Carbonate of Potash.

Take of Solution of Subcarbonate of Potash a gallon;
Pass Carbonic Acid through the Solution of Subcarbonate of Potash in a proper vessel, to full saturation and strain. Let the strained liquor evaporate, that crystals may be formed, taking care that the heat does not

exceed 120°. The liquor being poured off, dry these upon bibulous paper.

Carbonic Acid is very easily obtained from white Marble and diluted sulphuric Acid.

Process.—I have already mentioned that subcarbonate of potash consists of one atom of each of its constituents, and that its correct name is *carbonate* of potash, the term by which the College continue to designate what is now usually denominated *bicarbonate* of potash, as consisting of two atoms of acid and one atom of base. As the process will be better understood by using the correct chemical terms, I shall, on the present occasion, depart from my usual plan of adopting the College nomenclature. Carbonate of potash (*potassæ subcarbonas* of the Pharmacopœia) consists of one atom of acid and one of potash. Marble, or carbonate of lime, is composed of one atom of carbonic acid and one of lime. When sulphuric acid is added to the carbonate of lime, it is decomposed by the superior affinity of the sulphuric acid for the lime; and the carbonic acid evolved in the gaseous state, being passed into the solution of carbonate of potash, combines with and converts it into bicarbonate, while sulphate of lime remains in the vessel in which the sulphuric acid is poured upon the marble.

Bicarbonate of Potash=2 atoms Acid+1 atom Potash.

Carbonate of Lime. { Carbonic Acid, 1 atom } { Carbonate of Potash, 1 atom Acid+1 atom Potash }

Carbonate of Lime. { Lime, 1 atom. Sulphuric Acid. }

Sulphate of Lime.

There are two difficulties in this process; first, the sulphate of lime formed, envelopes a portion of the carbonate of lime or marble, and prevents its decomposition. It is much better to employ muriatic acid; the operation is more manageable, on account of the greater facility of removing muriate than sulphate of lime; and at the present low price of common salt, this acid will not be much more expensive than the sulphuric; and if it were so, I find that it is easy

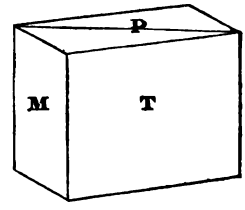
to recover most of the muriatic acid in a state fit for using again, and with very little loss, by decomposing the solution of muriate of lime with dilute sulphuric acid. The muriatic acid thus procured may be poured off from the precipitated sulphate of lime. The second inconvenience arises from using so strong a solution as that directed in the Pharmacopœia. Allowing for the 16 per cent. of water which the subcarbonate of potash contains, the solution in question consists of very nearly 13 oz. 2 dr. of water, and 10 oz. 2 scr. of subcarbonate of potash. Now, to convert this into crystallized carbonate, or rather bicarbonate, it must combine with 3 oz. 1 dr. 1 scr. of carbonic acid, and with 1 oz. 2 dr. 1 scr. of water of crystallization; the whole product of the crystallized carbonate will consequently amount to 14 oz. 4 dr. 1 scr. and the quantity of water will be reduced to less than 12 oz. According to Dr. Paris, and other authorities, bicarbonate of potash requires four times its weight of water at 60° to dissolve it, and, consequently, instead of evaporation being necessary for the production of crystals in this process, there is but little more than one-fifth of the water present necessary for their solution.

One pound of subcarbonate of potash should be dissolved in about six times its weight of water; this, for its conversion into carbonate, will require the carbonic acid of 7 oz. 1 dr. nearly of marble or chalk, evolved by two and a half times its weight of muriatic acid, of sp. gr. 1.160, diluted with twice its quantity of water. The solution of muriate of lime obtained may be decomposed by 7 oz. 3 dr. of sulphuric acid diluted with four or five times its quantity of water; the clear dilute muriatic acid being poured off from the sulphate of lime, it may be used for the decomposition of a fresh portion of carbonate of lime. The above are nearly the proportions requisite, supposing the whole of the carbonic acid evolved to combine with the subcarbonate of potash; but in practice this never happens, and the saturation must be determined either by experience or by the use of turmeric paper.

Qualities.—This salt is inodorous, colourless, and crystalline. When properly prepared it has scarcely any alkaline taste, and acts but slightly, if at all, upon turmeric paper. It suffers no change by exposure to the air. It requires four times its weight of water at 60° for solution: by boiling water it is partially decomposed, and rendered more soluble by the loss of carbonic acid. When exposed to a low red heat, it loses half its carbonic acid, the whole of its water of crystallization, and returns to the state of subcarbonate; and this is a good method of procuring the latter in a state of purity. It is insoluble in alcohol.

The primary form of this substance is *a right oblique-angled prism*, which is not readily traced in the secondary crystals, but may be derived from cleavage, and is shown in Fig. 1. There is also a cleavage parallel to a plane passing through the diagonal marked on the terminal planes.

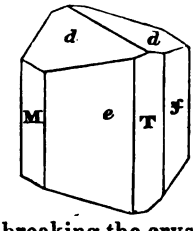
Fig. 1.



P on M, or T	90°	00′
M on the diagonal plane	53	15
M on T.....	103	25

The planes which appear on the crystals are represented in Fig. 2; but the planes *e* are sometimes very disproportionately extended, so as nearly to efface T and *f*, giving to the crystals the character of another primary form.

Fig. 2.



The planes T do not commonly occur on the crystals, and without these they nearly resemble a secondary form of the *right rhombic prism;* they may, however, be distinguished by the unequal inclination of M on the two adjacent planes. On cleaving or otherwise breaking the crystal, water may be observed between the laminæ, which probably occasions the measurement on the cleavage planes not accurately to agree. This is also the case with many other of the factitious salts.

M on plane parallel to *f*	127°	35′
M on *e*	126	45
T on *e*	156	50
T on *f*.....	128	50
e on *f*.....	105	40
M on *d*	111	00
d on *d*′	138	00

Composition.—Carbonate, correctly bicarbonate of potash, is composed of

Carbonic acid	43.56	or 2 atoms acid 22×2=	44
Potash	47.53	1 atom potash.... =	48
Water	8.91	1 atom water .... =	9
	100.00	Weight of its atom=	101

Adulteration.—This salt should dissolve entirely in dilute nitric acid, and form a perfectly clear solution, in which

neither nitrate of barytes, nitrate of silver, nor subcarbonate of soda should produce any turbidness. If perfectly saturated with carbonic acid, no precipitation will be effected by adding a solution of it to one of sulphate of magnesia; the solution should scarcely affect turmeric paper.

Incompatibles.—These are nearly the same as enumerated when treating of subcarbonate of potash. It does not, however, produce any precipitate in a solution of sulphate of magnesia; and calomel is not at all decomposed by it.

Medicinal Uses.—In cases where an alkali is indicated, this preparation offers an agreeable and efficient remedy; and experience has shown that its additional proportion of carbonic acid does not in the least invalidate its alkaline agency. Dose, grs. x. to xxx.

LIQUOR POTASSÆ.

Solution of Potash.

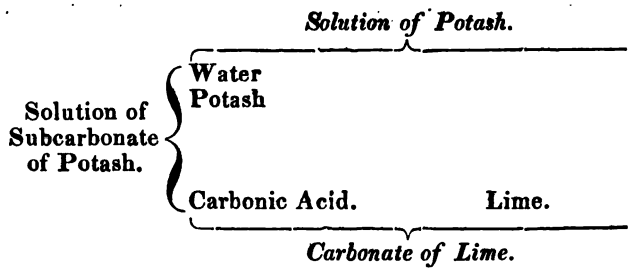
Take of Subcarbonate of Potash a pound,
Fresh Lime half a pound,
Boiling distilled Water a gallon;

Dissolve the Potash in two pints of the Water. Add that which is left of the Water to the Lime. Mix the hot liquors together; then set aside in a covered vessel, and after they have cooled strain through a cotton cloth.

If any diluted acid dropped in excite bubbles, it will be necessary to add more Lime and to strain again.

A pint of this Solution ought to weigh sixteen ounces.

Process.—This is a case of single elective affinity and decomposition:—the lime has a strong affinity for the carbonic acid which has been expelled from it by heat; and when it is mixed with the subcarbonate of potash, owing to the greater affinity existing between the earth and the acid than between the alkali and the acid, the carbonate of potash is decomposed, and the potash remaining in solution, the carbonate of lime formed is precipitated.



Qualities.—Solution of potash is limpid, colourless, and inodorous; its taste is extremely acrid and caustic; and, when rubbed between the fingers, it feels soapy, in consequence of a partial solution of the cuticle. A pint is stated to weigh 16 oz. and if so, its sp. gr. must be 1.056. It should be carefully preserved from contact with the air, in order to prevent the absorption of carbonic acid.

Adulteration.—Although the potash is by this process sufficiently deprived of carbonic acid for medicinal uses, yet it always retains a certain portion of the acid; so that it is in vain to expect to procure it so perfect as that lime water shall occasion no precipitation, or an acid no effervescence.

Incompatibles.—Acids, acidulous salts, subcarbonate, acetate and muriate of ammonia, preparations of metals and earths held in solution by acids; calomel, and corrosive sublimate.

Officinal Preparations.—Potassa Fusa, Potassa cum Calce, Antimonii Sulphuretum Præcipitatum.

Medicinal Uses.—Antacid, diuretic, alterative, and lithonthryptic; it has also been found useful in some cutaneous diseases, as in lepra, psoriasis, &c. Dose ♏ x. to ʒss. It is recommended to give it in veal broth or in table beer: the latter is said to disguise its nauseous flavour completely. Care, however, ought to be taken that the beer is not sour.

POTASSA FUSA.

Fused Potash.

Take of Solution of Potash a gallon;

Evaporate the water in a clean iron vessel over the fire, until, the ebullition being finished, the Potash liquefies; pour this upon an iron plate into proper moulds.

Qualities.—Fused potash is a compound of potash and water, and its correct chemical appellation is hydrate of potash; when pure it is white, hard and brittle, but as usually prepared for medicinal purposes, it contains the various impurities of the solution, and frequently peroxide of iron, acquired during evaporation. It is generally of a brownish and sometimes of a blueish tint, is extremely caustic, and very deliquescent, attracting first water and then carbonic acid from the atmosphere; water dissolves nearly an equal weight of it, and during solution heat is extricated.

Unlike the carbonate and subcarbonate of potash, it dissolves readily in alcohol. It possesses in the strongest degree the properties denominated alkaline.

The potassa fusa of the Pharmacopœia is not mere potash or oxide of potassium, but, as above remarked, hydrate of potash, consisting of

Potash....	84.2	or 1 atom of potash	= 48
Water	15.8	1 atom of water.....	= 9
	100.0	Weight of its atom	= 57

Hydrate of potash, or potassa fusa, melts when exposed to a low red heat; but so great is the affinity existing between the potash and the water, that although they may be evaporated together at a bright red heat, the water cannot be separated by it. During the preparation of the potassa fusa a portion of the potash becomes peroxide of potassium, but the additional oxygen thus acquired, is given out again in the gaseous state, during solution in water.

Medicinal Uses.—Potassa fusa is used only externally as a caustic; excepting for particular purposes, the argenti nitras or lunar caustic is generally preferred; for, on account of the deliquescent property of the potassa fusa, it is difficult to confine its action within the requisite limits.

POTASSA CUM CALCE.

Potash with Lime.

Take of Solution of Potash three pints,
Fresh Lime a pound;
Boil down the Solution of Potash to a pint; afterwards

add the Lime slaked by water poured upon it, and carefully mix.

The lime is intended to render the potash less deliquescent and more manageable as an escharotic.

POTASSÆ ACETAS.

Acetate of Potash.

Take of Subcarbonate of Potash a pound,
Stronger Acetic Acid two pints,
Boiling Distilled Water two pints;

Add the Acid, first mixed with the Water, to the Subcarbonate of Potash, until bubbles are no longer excited, and strain. Evaporate the liquor first in a water bath, until ebullition has ceased. Afterwards expose it to a heat gradually increased, and again evaporate until a pellicle floats; dry the pellicle removed upon bibulous paper. Let the liquor be evaporated again and frequently, and remove and dry the pellicle in the same manner.

Process.—This is an instance of single elective affinity and decomposition. Owing to the greater affinity of the acetic acid for potash, the carbonic acid is expelled in the gaseous state; it is an unquestionable improvement to employ pure acetic acid in this preparation, as now directed by the College, instead of distilled vinegar; for the decomposition of the mucilage contained in the latter, rendered it difficult to procure a white salt. One hundred grains of the acidum aceticum fortius are stated to saturate 87 of crystallized subcarbonate of soda; now the quantity of this alkaline salt required to saturate a given portion of any acid, is to that of the subcarbonate of potash, of the Pharmacopœia, as 144 to 84 very nearly, and consequently 100 grains of the acidum aceticum fortius, saturate about 50 grains of the subcarbonate, and as two pints of the acetic acid weigh 32 oz. within a drachm, they will require 16 oz. of subcarbonate of potash

for their saturation: so that 12 oz. will require only 3-4ths of the acetic acid directed by the College.

I have not tried the present method of preparing the acetate of potash, but I entertain some doubt of its eligibility, except as to the substitution of pure acetic acid for distilled vinegar.

Qualities.— As usually prepared, acetate of potash is colourless and nearly inodorous; its taste is pungent and saline, it has a foliated texture, and is extremely deliquescent, very soluble in water, and is dissolved also by alcohol; it is decomposed by a strong heat, and converted into subcarbonate of potash.

Composition.—Acetate of potash consists of

One atom of acetic acid	= 51
One atom of potash	= 48
Weight of its atom	= 99

Adulteration.—Sulphates are detected by adding a solution of nitrate of barytes to one of the salt in question, and muriates by nitrate of silver; but if neither of them occasion a precipitate insoluble in excess of nitric acid, then it is free from these admixtures. It has been stated that if it contain tartrate of potash, tartaric acid will form a bitartrate with it, and crystals of this salt will be formed; the fact is, however, that tartaric acid decomposes the acetate of potash itself, and produces the effect attributed to the presence of previously existing tartrate of potash.

Incompatibles.—It is decomposed by the sulphuric, muriatic, nitric, and other strong acids, the acetic acid being expelled; it is also decomposed by sulphate of soda, and of magnesia, and by several metallic and earthy salts.

Medicinal Uses.—In small doses it is diuretic, and in larger ones mildly cathartic. Dose as a diuretic from ℈j. to ʒj.; as a cathartic from ʒij. to ʒiij. As it is deliquescent it must be exhibited in solution.

POTASSÆ TARTRAS.

Tartrate of Potash.

Take of Subcarbonate of Potash sixteen ounces,
Supertartrate of Potash three pounds,
Boiling Water a gallon;

Dissolve the Subcarbonate of Potash in the Water; then add the Supertartrate of Potash rubbed to powder, until bubbles are no longer excited. Strain the liquor through paper; afterwards boil it until a pellicle floats, and set aside that crystals may be formed; the liquor being poured off, dry these upon bibulous paper.

Process.—Supertartrate of potash, it has been already stated, is a salt deposited from wine; it consists of tartaric acid and potash, and the acid being sufficient to saturate as much more potash as that with which it is already combined, the salt is correctly called bitartrate of potash. This salt has an acid taste, is difficultly soluble in water, and the solution reddens vegetable blue colours.

It consists of

Tartaric acid	70	or 2 atoms of tartaric acid	66×2=132
Potash	25.3	1 atom of potash.....	= 48
Water.....	4.7	1 atom of water	= 9
	100.0	Weight of its atom	=189

The primary form of supertartrate or bitartrate of potash is a *right rhombic prism:* the first of the annexed figures represents the planes of its ordinary crystal in a perfect state: M and M′ are the lateral primary planes, and the crystals admit of cleavage parallel to those planes, and to the plane *h*, which is parallel to the shorter diagonal of the primary prism; it also cleaves parallel to the longer diagonal. The crystals are not however commonly so perfect as this figure, nor indeed is it usual to observe all its planes; for owing to the extraordinary enlargement of certain of them, others are either much diminished, or totally disappear. The common crystals are represented by the second figure; and in observing them, it must be recollected that the plane *h* is constantly striated, as represented in both figures.

Fig. 1.

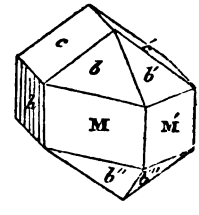
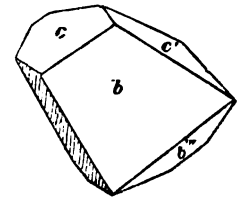


Fig. 2.



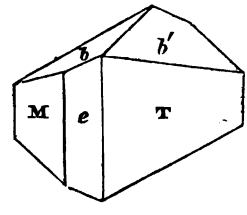
M on M'	107°	30'
—— *h*.....	126	15
—— *b*.....	117	2
b on *b'''*	74	0
b on *c*.....	141	25
b on *c'*	103	18
c on *h*.....	125	30
c on *c'*	109	0

One hundred parts of this salt require 25.3 of potash for their saturation, which are equivalent to 43.8 of subcarbonate of potash. Three pounds of supertartrate of potash therefore require 15.75 ounces of subcarbonate, by calculation, and by experiment I have found it 15.7; the proportions directed by the College are therefore as nearly as possible correct.

When these salts are made to act upon each other, the excess of tartaric acid in the supertartrate expels the carbonic acid in the state of gas from the subcarbonate of potash, and the supertartrate by this addition of potash becomes simple or neutral tartrate of potash.

Qualities.—Tartrate of potash has a bitter taste, is readily soluble in water, and hence its former name of soluble tartar. It is sometimes met with in the shops in the state of powder, but it ought always to be crystallized. In a moist atmosphere it attracts water, and is by a red heat decomposed, and converted into subcarbonate of potash.

The primary form of tartrate of potash is a *right oblique-angled prism*, with cleavages parallel to the lateral planes.



M on T	89°	30'
M on *e*.....	142	13
M on *b*.....	107	30
T on *e*.....	127	17
T on *b'*	103	40

Composition.—Tartrate of potash consists of

Tartaric acid	57.9	or 1 atom acid.....	= 66
Potash.....	42.1	1 atom potash.....	= 48
	100.0	Weight of its atom	=114

Adulteration.—This salt is not likely to be mixed with others, but if it have been imperfectly prepared and not crystallized, it may contain excess of supertartrate of potash, or of subcarbonate of potash; the presence of these, if suspected,

may be determined by litmus or turmeric paper. If any sulphuric salt have been mixed with it, it will be shown by affording a precipitate with muriate of barytes, insoluble in muriatic acid; muriatic salts will be detected by nitrate of silver yielding a precipitate insoluble in nitric acid.

Incompatibles.—Tartrate of potash is decomposed by most acids, and many acidulous salts, for when added to a solution, they occasion the formation and crystallization of bitartrate of potash. It is decomposed by lime water and muriate of lime, and by solutions of lead and silver.

Medicinal Uses.—It is a mild and efficient purgative, and when given with resinous purgatives or senna, it corrects their griping properties by accelerating their operation. Dose, ʒj. to ℥ j. in solution.

POTASSÆ SUPERSULPHAS.

Supersulphate of Potash.

Take of the Salt which remains after the distillation of nitric Acid two pounds,
Boiling Water four pints;
Mix, so that the Salt may be dissolved, and strain. Afterwards boil to half, and set aside, that crystals may be formed; the liquor being poured off, dry these upon bibulous paper.

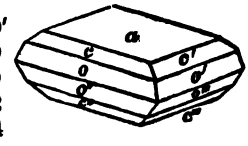
Process.—It has been already explained, that the salt which remains after the distillation of nitric acid, consists of potash, combined with twice as much sulphuric acid as is required for its saturation, and that in chemical language it is called bisulphate of potash.

In preparing this salt, it is requisite that the solution should be sufficiently evaporated, for if the quantity of water be too large, the excess of sulphuric acid remains in combination with it, and common sulphate of potash is procured.

The annexed sketch and measurements of the common crystal of this salt, were furnished by my brother, the late Wm. Phillips; but the crystal is much flatter than the sketch, and occasionally other planes may be observed, which, when they prevail, tend to alter the general form of the crystal:

but neither these forms, nor that of the primary crystal have yet been determined; the primary may however prove to be either a *right rhombic prism*, or an *octahedron with rhombic bases*. There appears to be but one cleavage:—namely, parallel to the plane *a;* some very slight errors in the measurements may exist, since they were taken by means of the reflective goniometer by candle-light.

a on *c* or *c'*	135°	0′
——*o* or *o'*	108	30
c on *c'*	125	10
o on *o'*	103	52
o on *o''*	142	44



Qualities.—This salt is extremely acid and bitter; it is very soluble in water, the solution acts strongly upon vegetable blue colours, and decomposes the alkaline, earthy, and metallic carbonates with effervescence. By a red heat the water of crystallization and half of the acid are expelled, and common sulphate of potash remains.

Composition.—It is composed of

Sulphuric acid	54.80	or 2 atoms acid..40×2=	80
Potash	32.87	1 atom potash.....=	48
Water	12.33	2 atoms water..9×2=	18
	100.00	Weight of its atom=	146

Adulteration.—If the proper quantity of sulphuric acid has been used in preparing the nitric acid, and the solution sufficiently evaporated, there is no danger of admixture; but if the sulphuric acid has been deficient, then a mixture of sulphate and nitrate of potash is obtained; and without due evaporation, common sulphate and sometimes sesquisulphate of potash crystallizes, even when there is sufficient sulphuric acid.

Incompatibles.—This salt is incompatible with alkalies, earths, and their carbonates; many metals and most oxides are acted upon by the excess of acid which it contains.

Officinal Preparations.—Potassæ Sulphas.

Medicinal Uses.—It is exhibited combined with other purgatives, especially with Rhubarb. Dose, gr. x. to ʒij.

POTASSÆ SULPHAS.

Sulphate of Potash.

Take of the Salt which remains after the distillation of Nitric Acid two pounds,
Boiling Water two gallons;

Mix, so that the Salt may be dissolved; then add of Subcarbonate of Potash as much as may be sufficient to saturate the Acid. Afterwards boil until a pellicle floats, and, when strained, set it aside, that crystals may be formed. The liquor being poured off, dry these upon bibulous paper.

Process.—When subcarbonate of potash is added to the supersulphate of potash, the carbonic acid of the former is expelled by the excess of sulphuric acid of the latter, and the result is neutral sulphate of potash. The most economical method however of procuring sulphate from bisulphate of potash, is to expel the excess of acid by heat, for sulphate of potash is of less value than subcarbonate: two pounds or 24 oz. of the dry bisulphate of potash require nearly 16 oz. of the subcarbonate for their saturation, which is attended with the evolution of carbonic acid gas.

Qualities.—This salt is colourless, inodorous, bitter and rather hard; water at 60° dissolves only one-sixteenth of its weight, but boiling water a much larger quantity; it is insoluble in alcohol. It suffers no change by exposure to the air, or by a moderate degree of heat, for it contains no water of crystallization.

The primary form of this salt is a *right rhombic prism;* M M′ and P are primary planes.

Fig. 1 is a single modified crystal.

M on M′	120°	30′
M on *h*	120	45
M on *e*	146	22
h on *c*	146	10
e on *e*′	131	12

Fig. 1.

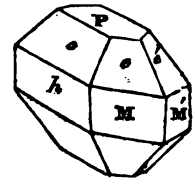


Fig. 2 is the compound crystal, which consists of three single crystals, so united that their upper edges meet at angles of 120°, and consequently the planes of junction incline to each other at the same angle. Hence

M on M'' ..... 119° 30'
e on e'' 130 24

Fig. 2.

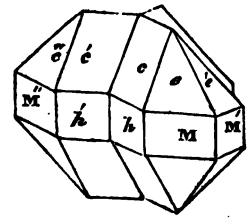


Fig. 3.

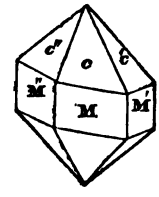


Fig. 3 is one of the common bi-pyramidal crystals, whose relation to the preceding figures may be perceived from the corresponding letters on the planes.

The union of these three crystals takes place at an angle of 120°.

Composition.—Sulphate of potash is composed of

Sulphuric acid	45.45	or 1 atom of acid	= 40
Potash	54.55	1 atom of potash..	= 48
	100.00	Weight of its atom	= 88

Adulteration.—This salt is so extremely cheap, and in its crystalline state any mixture would be so obvious, that adulteration is hardly to be suspected. It may, however, be observed, that the solution should produce no change in the colour of litmus or turmeric paper; no precipitate with solution of sulphate of silver, nor any upon the addition of ammonia or its subcarbonate.

Incompatibles.—The solution of this salt is decomposed by tartaric acid, which forms crystals of bitartrate of potash; by muriate of barytes, barytes water, and muriate of lime, but not by lime water as has been asserted; it also decomposes the solutions of acetate and subacetate of lead.

Medicinal Uses.—It should be exhibited in the form of powder, in conjunction with rhubarb or some other purgative medicine. On account of its hardness it is an eligible substance for triturating with other bodies and dividing powders; with this intention it enters into the composition of Pulvis Ipecacuanhæ Compositus. Dose, gr. x. to ʒss.

SODÆ SUBCARBONAS.

Subcarbonate of Soda.

Take of Impure Soda, powdered, a pound,
Boiling Distilled Water four pints;
Boil the Soda in the Water for half an hour, and strain. Let it evaporate to two pints, and be set aside, that crystals may be formed. Reject the remaining liquor.

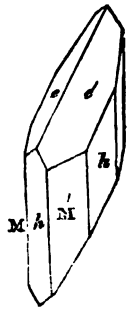
Process.—Soda, sometimes called natron or the mineral alkali, is the protoxide of the metal sodium; it consists of

Sodium 75	or 1 atom of sodium	=	24
Oxygen 25	1 atom of oxygen	=	8
100	Weight of its atom	=	32

By the term impure soda, it is presumed that the College mean *barilla* or the impure subcarbonate, obtained by the incineration of sea weed; this consists of various saline, and other impurities, mixed with variable quantities of subcarbonate of soda, which may be separated in a state of considerable purity by crystallization. The quantity of water directed to be used is larger than is requisite; this salt is however hardly ever prepared except on the great scale, and then not from barilla, but by more economical means.

Subcarbonate of soda is frequently met with in crystals of considerable size; the primary form of which appears to be *an oblique rhombic prism.*

Fig. 1.

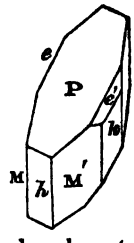


This figure represents the ordinary shape of the crystals.

P on M, or M'	108°	43'
P on *e*, or *e'*	128	52
P on *h*	121	20
M on M'	76	12
M on *h*	128	0
M on *k*	141	54
e on *e'*	79	44
e on *k*	143	8

The crystals represented by Fig. 2, are reduced in height, and so thin as to leave scarcely a vestige of the planes M and *h*, and several are hemitropes, the plane of imaginary section being parallel to P.

Fig. 2.



Qualities.—Subcarbonate of soda is colourless and inodorous, its taste is alkaline and disagreeable, but less so than that of subcarbonate of potash; the crystals contain a large quantity of water, the greater part of which they readily lose by exposure to the air, and at high temperatures the salt becomes fluid and boils. Water at 60° dissolves half its weight of subcarbonate of soda, and boiling water considerably more. The solution possesses the alkaline property of rendering vegetable yellows brown.

Composition.—Subcarbonate of soda in the crystallized state consists of

Carbonic acid..15.3	or 1 atom acid	=	22
Soda 22.2	1 atom soda	=	32
Water 62.5	10 atoms water 9 × 10	=	90
100.0	Weight of its atom	=	144

Although in the Pharmacopœia this salt is called subcarbonate, its correct name is carbonate, as it consists of one atom of acid and one of base.

Adulteration.—This salt frequently contains a considerable admixture of sulphate of soda and common salt; to detect these, convert the subcarbonate into a nitrate, and add to separate portions of the solution, nitrate of barytes and nitrate of silver; if the former give a precipitate, it is owing to the presence of a sulphuric salt, and if the latter, to common salt.

Incompatibles.—This salt is incompatible with acids, acidulous salts, lime water, muriate of ammonia, earthy and metallic salts.

Pharmaceutic Uses.—In preparing Ferri Subcarbonas, and Pilulæ Ferri Compositæ.

Medicinal Uses.—These are similar to those of the subcarbonate of potash, but this salt is preferable as being more mild and less nauseous. Dose from gr. x. to ʒss. twice or thrice a day.

SODÆ SUBCARBONAS EXSICCATA.

Dried Subcarbonate of Soda.

Take of Subcarbonate of Soda a pound;

Apply a boiling heat to the Subcarbonate of Soda in a clean iron vessel, until it is perfectly dried; and stir it constantly also with an iron spatula. Lastly, rub it to powder.

Process.—It has been already mentioned that subcarbonate of soda contains more than 62 per cent. of water, which is expelled by the boiling heat here directed. In this state it is conveniently exhibited in powder, mixed with other medicines. Dose, gr. v. to xv.

SODÆ CARBONAS.

Carbonate of Soda.

Take of Subcarbonate of Soda a pound,
Distilled Water three pints;

Dissolve the Subcarbonate of Soda in the distilled Water. Afterwards pass carbonic acid through the liquor, in a proper vessel, to full saturation, and set it aside that crystals may be formed. Dry the crystals wrapped and pressed in bibulous paper. Evaporate the remaining liquor, taking care that the heat does not exceed 120°, that crystals may again form. Press and dry these in the same manner.

Process.—This process is similar to that employed for the preparation of Potassæ Carbonas, and nearly the same observations will apply to it; the salt is bicarbonate of soda.

Qualities.—When the solution becomes perfectly neutral, so as not to affect turmeric paper, crystals of bicarbonate of

soda are formed, and this salt being much less soluble in water than the subcarbonate, it falls down in the state of minute crystals; these are perfectly white, have but a slight and not an alkaline taste, and are partially decomposed even at a very moderate temperature.

Composition.—Carbonate, or rather bicarbonate of soda, consists of

Carbonic acid	57.9	or 2 atoms of acid .. 22×2	= 44
Soda	42.1	1 atom of soda	= 32
	100.0	Weight of its atom	= 76

According to Dr. Thomson in its crystalline state it consists nearly of

Bicarbonate of soda	90	or 1 atom of salt	= 76
Water	10	1 atom of water	= 9
	100	Weight of its atom	= 85

Although I have seen what I believe to be real bicarbonate of soda, in the state of the moist crystals, yet I have never met with any that was dry which had not lost one-fourth of its carbonic acid by exposure to heat; it is then a white gritty powder, less soluble in water than the subcarbonate, like which it possesses an alkaline taste, and turns vegetable yellows brown, but both in a less degree.

This salt sometimes crystallizes, but the form of the crystal has not been determined; it is decomposed by a red heat, as the bicarbonate is, and dry subcarbonate of soda remains.

Composition.—This salt, which is generally sold as the carbonate of the Pharmacopœia, and the bicarbonate of chemists, is a compound of an atom of carbonate and an atom of bicarbonate soda, combined with water: it consists of

Carbonic acid	39.76	or 3 atoms of carbonic acid	22×3= 66
Soda	38.55	2 atoms of soda	32×2= 64
Water	21.69	4 atoms of water	9×4= 36
	100.00	Weight of its atom	=166

Salts constituted of an atom of carbonate combined with one of bicarbonate, are sometimes called *sesquicarbonates*, as being equivalent to an atom and a half of acid and one atom of base. Salts of this description are not very common; but the ammoniæ subcarbonas of the Pharmacopœia has already

been noticed as an example; the sesquicarbonate of soda occurs native in Africa, in hard striated masses.

Adulteration.—If the salt, after supersaturation with dilute nitric acid, give a precipitate with nitrate of barytes, it contains a sulphuric salt; and if with nitrate of silver, a similar effect be produced, a muriatic salt is present.

Incompatibles.—The same as with subcarbonate of soda.

Medicinal Uses.—Similar to those of the subcarbonate. Dose, gr. x. to gr. xxx. This salt is also employed for the purpose of making what are termed *sodaic powders*, by mixture with tartaric acid: these are used as a substitute for soda water, from which they differ in being tartrate of soda, with a portion of carbonic acid diffused through the solution, instead of consisting of carbonate of soda with an excess of carbonic acid gas.

SODÆ SULPHAS.

Sulphate of Soda.

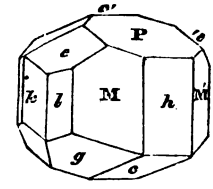
Take of the Salt which remains after the distillation of Muriatic Acid two pounds,
Boiling Water two pints and a half;

Dissolve the Salt in the Water; then add gradually of Subcarbonate of Soda as much as may be sufficient to saturate the Acid. Boil down until a pellicle appears, and, when strained, set aside that crystals may be formed; the liquor being poured off dry these upon bibulous paper.

Process.—The production of sulphate of soda during the preparation of muriatic acid has been already explained. Although the excess of sulphuric acid employed is small, yet the saturation of it by subcarbonate of soda, instead of expulsion by heat, incurs a needless expense, as explained when treating of Potassæ Sulphas.

Qualities.—Sulphate of soda readily crystallizes. The primary form of this salt is *an oblique rhombic prism.*

P on M, or M'	101°	20'
P on *e*, or *e'*	133	18
P on *h*	107	44
P on *c'*	130	45
M on M'	80	24
M on *h*	130	12
M on *l*	162	38
M on *k*	139	48



This salt has a very bitter taste. By exposure to the air it effloresces, and a white powder is left. It is extremely soluble in water, three parts of which, at 60°, dissolve one part of the salt: boiling water dissolves its own weight. It is insoluble in alcohol. When exposed to heat it first undergoes watery fusion by melting in its water of crystallization; when the water has evaporated it becomes white, and at a red heat it melts.

Composition.—Sulphate of soda is composed of

Sulphuric acid 55.55	or 1 atom of acid	= 40
Soda 45.44	1 atom of soda	= 32
100.00	Weight of its atom	= 72

In the crystallized state this salt consists of

Sulphuric acid.. 24.69	or 1 atom of acid	= 40
Soda 19.75	1 atom of soda.....	= 32
Water 55.56	10 atoms of water....	= 90
100.00	Weight of its atom	=162

Adulteration.—If this salt contain acid or alkali in excess, they may be discovered by litmus or turmeric paper; common salt, by solution of sulphate of silver; and oxide of iron, by solution of ferrocyanate of potash or by tincture of galls.

Incompatibles.—Subcarbonate of potash, muriate of lime, solution of barytes and barytic salts; and nitrate of silver, if the solutions be strong; acetate and subacetate of lead.

Medicinal Uses.—A common and efficient purgative. Its nauseous taste may be in a great degree disguised by the addition of a small quantity of lemon juice, or of supertartrate of potash. Dose ʒss. to ʒij.

SODA TARTARIZATA.

Tartarized Soda.

Take of Subcarbonate of Soda twenty ounces,
Supertartrate of Potash, powdered, two pounds,
Boiling Water ten pints;

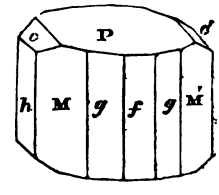
Dissolve the Subcarbonate of Soda in the Water, and add gradually the Supertartrate of Potash. Strain the liquor through paper; then boil, until a pellicle floats, and set aside, that crystals may be formed; the liquor being poured off, dry these upon bibulous paper.

Process.—In this preparation the excess of tartaric acid contained in the supertartrate of potash is saturated with soda, by decomposing the subcarbonate and expelling its carbonic acid in the gaseous state. I have already stated that 189 parts of super or bitartrate of potash contain 66 parts, or one atom, of tartaric acid in excess; and this requires, by theory, 144 parts, or one atom of subcarbonate of soda for its saturation, and consequently the quantities directed by the College are as nearly correct as 18.3 to 20; but they must be a little subject to variation, on account of the efflorescent nature of the subcarbonate of soda.

Qualities.—This salt forms large and beautiful crystals. The form derived from cleavage is *a right rhombic prism*. This is modified in the crystals measured, as shown in Fig. 1.

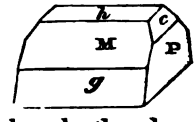
Fig. 1.

P on M, or M′	90°	0′
P on *c*	138	50
M on M′	100	0
M on *g*, M′ on *g*′	163	0



There is a peculiarity in the crystals of this substance. They are produced nearly in halves, and appear to have rested or been formed on planes which would have passed through the middle of the entire crystal. One of these natural segments is shown in Fig. 2; but in others of them the front half of Fig. 1 is the portion produced, the plane *f* being then uppermost. In some of the segments, however, there is a slight deviation from this exactness of position of the planes *f* or *h*.

Fig. 2.



This salt is colourless, inodorous, bitter and saline, very slightly efflorescent when exposed to the air. It is soluble in five parts of water at 60°, and more so in boiling water. It is decomposed by a strong heat; the residuum is a mixture of carbonate of potash and carbonate of soda.

Composition.—Soda Tartarizata is a double salt, consisting of

Tartrate of potash 40	or 1 atom of tartrate of potash	=114
Tartrate of soda.. 34.5	1 atom of tartrate of soda	= 98
Water..... 25.5	8 atoms of water ....9×8	= 72
100.0	Weight of its atom	=284

Adulteration.—If this salt occur in large well defined transparent crystals, no adulteration is to be apprehended.

Incompatibles.—Most acids and acidulous salts, except the supertartrate of potash. By the action of the acids the tartrate of potash is converted into bitartrate or supertartrate. The acetate and subacetate of lead, and the salts of lime, are decomposed by this compound.

Medicinal Uses.—Dose, as a purgative, from ʒij. to ʒj.

EARTHS AND THEIR SALTS.

ALUMEN EXSICCATUM.

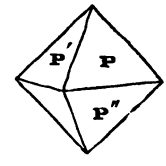
Dried Alum.

Let Alum liquefy in an earthen vessel over the fire; then let the fire be increased, until the ebullition has ceased.

Process.—By the heat the water of crystallization is driven off, and if it be too strong, a portion of the sulphuric acid is expelled with it, which ought to be avoided.

Composition.—Alum is a well known styptic, astringent, and acidulous salt; it is often met with in large crystals, the form of which is the *regular octahedron.*

P on P′
or
P on P″ } 109° 28′ 16″



Alum is unaltered by exposure to the air; it dissolves in five times its weight of water at 60°, and hot water dissolves nearly three-fourths of its weight; the solution reddens vegetable blue colours, showing the excess of acid.

Composition.—Different views are entertained of the atomic constitution of this salt; but it consists of

Sulphuric acid	32.86	or 4 atoms of acid ..	40×4=160
Alumina	11.08	2 atoms of alumina	27×2= 54
Potash	9.86	1 atom of potash	= 48
Water	46.20	25 atoms of water ..	9×25=225
	100.00	Weight of its atom	=487

or we may consider it as composed of 2 atoms of sulphate of alumina, 1 atom of bisulphate of potash, and 25 atoms of water.

Adulteration.—Alum sometimes contains iron, the presence of this may be determined by its giving a yellowish-red precipitate of peroxide on the addition of ammonia, more especially if the solution of the salt have been previously heated with a little nitric acid.

Incompatibles.—Alkalies and their carbonates; lime and lime water, magnesia and its carbonate, tartrate of potash, acetate of lead.

Officinal Preparations.—Alumen Exsiccatum. Liquor Aluminis Compositus.

Medicinal Uses.—Alum is internally a powerful astringent in hæmorrhages and inordinate fluxes, and is externally useful in repellent astringent lotions and collyria. Dose, gr. x. to gr. xx.

LIQUOR ALUMINIS COMPOSITUS.

Compound Solution of Alum.

Take of Alum,
Sulphate of Zinc, of each half an ounce,
Boiling Water two pints;

Dissolve the Alum and Sulphate of Zinc together in the water; afterwards strain through paper.

Medicinal Uses.—This solution is powerfully astringent, and is successfully used as a detergent lotion to old ulcers, as a collyrium and as an injection; it will also often remove chilblains, and relieve slight excoriations.

CRETA PRÆPARATA.

Prepared Chalk.

Take of Chalk a pound;

Add a little Water to the Chalk, and rub it to fine powder. Put this into a large vessel full of Water; then

stir it, and, after a short interval, pour off the supernatant Water, still turbid, into another vessel, and set it by, that the powder may subside; lastly, the Water being poured off, dry the powder.

Process.—This method of preparing the variety of carbonate of lime called chalk, is termed elutriation, and is an effectual method of reducing it to a fine powder.

Qualities.—Chalk is a substance so well known that it is hardly requisite to notice its qualities. When pure it is very nearly white. It is dull, opaque, soft, and light, and it always occurs massive. Its sp. gr. is about 2.300; it is sometimes of a greyish tint, and then contains an admixture of foreign matter.

Composition.—By the analysis of Bucholz, chalk is composed of

Carbonic acid	43
Lime.....	56.5
Water	5
	100.0

The water is an accidental admixture, and, when perfectly pure, carbonate of lime is composed of

Carbonic acid ..44	or of	1 atom of acid.... =	22
Lime.....56		1 atom of lime.... =	28
100		Weight of its atom =	50

Adulteration.—Chalk is so cheap an article that accidental admixture only can be suspected. If, however, what is termed *grey chalk* be used, the prepared chalk will contain some foreign matter, and the colour will be less perfect.

Incompatibles.—Chalk, or carbonate of lime, is incompatible with acids and acidulous salts, for they combine with its base and expel the carbonic acid in the state of gas.

Officinal Preparations.—Ammoniæ Subcarbonas, Calx, Hydrargyrum cum Creta, Mistura Cretæ, Confectio Aromatica.

Medicinal Uses.—It is antacid and absorbent, and therefore it is useful in acidities of the primæ viæ, and in diarrhœa, after removing all irritating matters by previous evacuation. It is also a good application to ulcers discharging thin ichorous matter. Dose, gr. x. to gr. xl. or more.

CALX.

Lime.

Take of White Marble a pound,

Break it into small pieces, and burn it in a crucible with a very strong fire for an hour, or until the carbonic Acid is perfectly expelled, so that diluted acetic acid added to it excites no bubbles.

Process.—By the action of heat the carbonic acid is expelled from marble or carbonate of lime; and, as the pure part both of chalk and marble contains 44 per cent. of carbonic acid, 100 parts should furnish 56 of lime. If the quantity remaining exceed this, the excess must be derived either from earthy impurity, or from a portion of the marble or limestone remaining undecomposed by the heat. This process can hardly be regarded as a necessary one, for lime is always to be had. The impurities which limestone contains are insoluble in water, and unimportant in all cases for medicinal uses.

Qualities.—Pure lime is colourless, moderately hard, but easily reduced to powder; unlike the limestone from which it is procured, it is sonorous, although but slightly. It is inodorous, and has a burning, alkaline taste, and it corrodes animal substances. Vegetable blue colours are changed to green by lime, and yellow to brown, evincing its alkaline properties. By exposure to the air it imbibes moisture, and falls to powder, and is gradually reconverted to the state of carbonate, by combining with the carbonic acid of the atmosphere.

When water is poured upon lime it is rendered extremely hot, swells, and becomes powdery, and combining with a portion of the water, is converted into hydrate of lime. Lime is slightly soluble in water, and the solution possesses alkaline properties. If lime be long exposed to atmospheric air, it loses its property of slaking, owing to its having combined with water and carbonic acid, and it is then unfit for use.

Composition.—Lime is the oxide of the metallic body calcium: it is composed of

Calcium....71.42	or of	1 atom of calcium	= 20
Oxygen 28.58		1 atom of oxygen	= 8
100.00		Weight of its atom	= 28

Hydrate of lime, or, as it is usually termed, *slaked lime*, is composed of

Lime 75.68	or of	1 atom of lime	= 28
Water....24.32		1 atom of water	= 9
100.00		Weight of its atom	= 37

Incompatibles.—All acids and acidulous salts, alkaline carbonates, ammoniacal salts, metallic salts, borates, and astringent vegetable infusions.

Officinal Preparations.—Liquor Calcis, Liquor Ammoniæ, Liquor Potassæ, Potassa cum Calce, Calcis Murias, Liquor Calcis Muriatis.

CALX E TESTIS.

Lime from Shells.

In the same manner Lime may be made also from Shells.

No peculiar advantage results from the use of shell limestone; the directions for preparing it appear therefore to be unnecessary.

LIQUOR CALCIS.

Lime Water.

Take of Lime half a pound,
Distilled Water twelve pints;

Pour the Water upon the Lime, and shake them together; then immediately cover the vessel, and set it aside for three hours; afterwards, keep the Solution with the remaining Lime in stopped glass vessels, and when it is to be used take from the clear Solution.

Process.—This is a simple solution of lime in water. Unlike most other substances, lime is more soluble in cold water than in hot: and when lime water which has been prepared with cold water is heated, small crystals of lime, probably containing water, are formed and deposited.

I find that

A pint of water at	32°	dissolves 11.0	grains of lime.
Ditto	60	9.7	ditto
Ditto	212	5.6	ditto

It is then evident that water at 32° takes up nearly one-seventh more lime than water at 60°, and almost double the quantity dissolved by boiling water.

Qualities.—Lime water is colourless and inodorous, but has a disagreeable alkaline taste. It turns vegetable blues green, and yellows brown; and it unites with oil by agitation, forming an imperfect soap. When lime water is exposed to the atmosphere it absorbs carbonic acid, a thin crust of carbonate of lime is rapidly formed on the surface, and eventually the whole of the lime is precipitated from solution: on this account lime water should be preserved from the air as carefully as possible.

Incompatibles.—Lime water is incompatible with the substances already enumerated with respect to lime itself.

Medicinal Uses.—It is antacid, and therefore useful in dyspepsia attended with acidity; it is also astringent in leucorrhœa, in the last stages of dysentery, and in protracted diarrhœa. Dose, in milk, f℥j. to f℥vj.

CALCIS MURIAS.

Muriate of Lime.

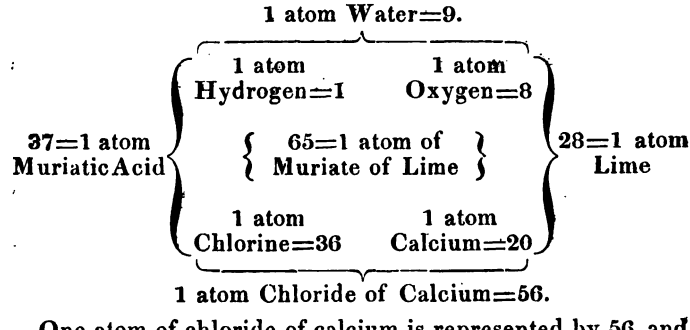
Take of the Salt which remains after the sublimation of Subcarbonate of Ammonia two pounds,
Water a pint;
Mix, and strain through paper; let the liquor evaporate until the Salt is dried. Keep this in a vessel accurately stopped.

Process.—It has already been stated (p. 39) that the salt, here termed muriate of lime, is a compound of chlorine, one

of the constituents of muriatic acid, and calcium, one of the elements of lime; its correct appellation is therefore chloride of calcium.

It is supposed by many chemists, that most chlorides, when dissolved in water, are converted into muriates by decomposing a portion of that fluid, and on the other hand, when these muriates are evaporated to dryness, they again become chlorides by the re-composition of water.

The annexed diagram will explain what occurs during the conversion of a chloride into a muriate by solution, and of a muriate into a chloride by evaporation.



One atom of chloride of calcium is represented by 56, and it is composed of an atom of chlorine 36 and one of calcium 20. When this is dissolved in water, an atom of that fluid 9, is decomposed, its atom of hydrogen, 1, unites with the 36 of chlorine, and 37 or 1 atom of muriatic acid is formed; while 8, the atom of oxygen of the water, combining with 20, the atom of calcium, 28 or 1 atom of lime results, which, uniting with the 37 of muriatic acid, form 65, one atom of muriate of lime.

When this solution of 65 of muriate of lime is evaporated to dryness, an atom of hydrogen 1, is expelled from the muriatic acid, and an atom of oxygen 8, separated from the lime combining with it, there are formed and evaporated 9, or an atom of water; consequently there remain 36 or an atom of chlorine, combined with 20, an atom of calcium, forming 56 or an atom of chloride of calcium.

Composition.—According to the above statement, chloride of calcium, the calcis murias of the Pharmacopœia, is composed of

Chlorine....64.29	or 1 atom of chlorine....	=	36
Calcium 35.71	1 atom of calcium	=	20
100.00	Weight of its atom	=	56

Qualities.—Chloride of calcium is colourless and inodorous; its taste is very bitter and pungent. By exposure to the air it deliquesces, and is of course very soluble in water; so that, at 60°, water dissolves nearly four times its weight of the compound, and hot water a still larger quantity. It is also very soluble in alcohol. By evaporation the solution yields crystals containing a large quantity of water.

Incompatibles.—This salt is decomposed by sulphuric acid and by sulphates, by the alkalies, potash, soda, and their carbonates. If ammonia be added to the solution, no change occurs; but carbonate of ammonia decomposes it, and precipitates carbonate of lime.

For *Medicinal Uses*, vide Liquor Calcis Muriatis.

LIQUOR CALCIS MURIATIS.

Solution of Muriate of Lime.

Take of Muriate of Lime two ounces,
Distilled Water three fluidounces;
Dissolve the Muriate of Lime in the water; then strain it through paper.

Process.—The nature of this solution will be understood from what has been stated in the preceding article; but as few persons are in the habit of preparing subcarbonate of ammonia, they are consequently at a loss for the means of procuring this medicine; it may, however, be obtained of the proper strength by the following process:

Take of White Marble, or pure chalk, two ounces,
Muriatic Acid, *by weight*, four ounces and five drachms, or enough to dissolve the marble,
Water four ounces;
Mix the muriatic acid and water; dissolve the carbonate of lime in the mixture; filter the solution, and evaporate it in a glass or earthen vessel, until there remain only five ounces and a half *by weight*.

The muriatic acid employed must be free from sulphuric acid; for if this be present, sulphate of lime will be formed and precipitated.

Incompatibles have been mentioned in the last article.

Medicinal Uses.—Deobstruent and tonic; it is stated to have been advantageously given in bronchocele and scrofula. Dose, ♏ xx. to f ʒj. or more.

MAGNESIÆ SUBCARBONAS.

Subcarbonate of Magnesia.

Take of Sulphate of Magnesia a pound,
Subcarbonate of Potash nine ounces,
Water three gallons;

Dissolve separately the Subcarbonate of Potash in three pints of the Water, and the Sulphate of Magnesia in five pints of the Water, and strain: afterwards add the remaining Water to the solution of Sulphate of Magnesia, and boil; and while it boils, mix the former liquor with it, stirring constantly with a spatula; then strain through linen; lastly, wash the powder, boiling water being frequently poured upon it, and dry it with a heat of 200° upon bibulous paper.

Although sulphate of magnesia is an article of the Materia Medica, I shall take this opportunity of stating its qualities, crystalline form, and composition. It was originally called Epsom Salt, having been procured from a spring at that place.

Sulphate of magnesia is one of the saline ingredients of sea water, and for a long time it was procured only from the bittern remaining after the preparation of common salt; thus obtained it was usually mixed with so considerable a quantity of muriate of magnesia, that owing to the deliquescent property of this salt, the sulphate was usually damp. It has since been much better prepared from magnesian limestone, by a very ingenious process, invented by Dr. Henry, and the salt so formed being unmixed with muriate of magnesia, does not attract moisture from the air.

Sulphate of magnesia crystallizes with great readiness, and although the crystals are usually small, they may be

obtained of considerable size by slowly cooling the solution. The primary form of this substance may be regarded as a *right prism* with a *rhombic base*, whose angles are 90° 30′ and 89° 30′.

There is only one cleavage, which is parallel to the short diagonal of the prism, and consequently to the plane *h* of the accompanying figures.

Fig. 1 represents a crystal of a form which frequently occurs, and of which the following are the measurements:

M on M′ (primary)	.. 90°	30′
M on *h*	134	45
M on *e*	129	00
a on *a*′	120	nearly

Fig. 1.

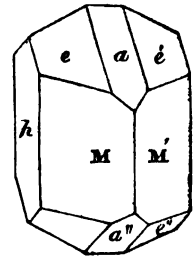
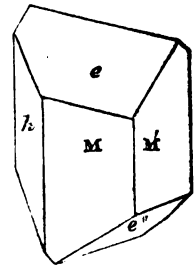


Fig. 2 represents a form in which the crystals also frequently appear. In this form, only two of the four planes *e* are seen on each summit, and alternating in position as shown in the figure.

On some of the crystals, however, which resemble this figure, the two other planes *e* may be perceived, but they are very minute.

Fig. 2.



Sulphate of magnesia is an extremely bitter salt, it is readily soluble in cold water, and still more so in hot water, the former dissolving an equal weight, and the latter one-third more; it is unalterable by exposure to the air, but when heated it loses its water of crystallization.

Composition.—Sulphate of magnesia is composed of

Sulphuric acid	32.52	or 1 atom of acid	= 40
Magnesia	16.26	1 atom of magnesia	= 20
Water	51.22	7 atoms of water....	9×7= 63
	100.00	Weight of its atom	=123

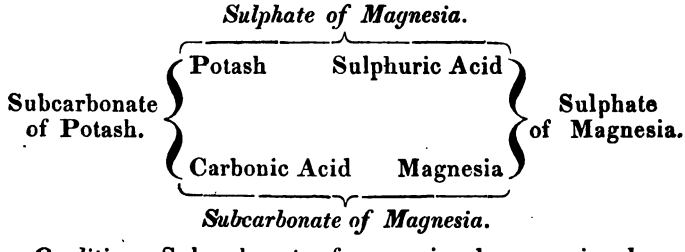
Adulteration.—If this salt be mixed with sulphate of soda, the quantity of pure sulphate of magnesia contained in any suspected salt, may be determined by ascertaining the quantity of carbonate of magnesia it will yield. Dissolve 100 grains of the salt in distilled water, and add to it a solution

of an equal weight of subcarbonate of soda; boil the mixture, and wash and dry the precipitate; the carbonate of magnesia thus procured, should amount to 34 grains; if any deficiency occur it is probably occasioned by an admixture of sulphate of soda. If sulphate of magnesia contain the muriate of the same earth, it will readily be detected by its becoming moist.

Incompatibles.—Sulphate of magnesia is incompatible with the alkalies potash and soda, and their subcarbonates, but the bicarbonates do not decompose it until part of their carbonic acid is expelled by heat. Ammonia decomposes it but partially, and the subcorbonate not at all. Lime water, and muriate of lime, are both incompatible with this salt, and so also are the acetates of lead.

Medicinal Use.—Sulphate of magnesia is extensively employed as a purgative. Dose, from ʒss. to ʒjss.

The process of preparing subcarbonate, or more correctly, carbonate of magnesia, from the sulphate, is one in which double decomposition takes place; the carbonic acid of the subcarbonate combines with the magnesia of the sulphate, and the subcarbonate of magnesia formed being insoluble in water, it is precipitated; the potash of the subcarbonate unites with the sulphuric acid of the sulphate of magnesia, and the resulting sulphate of potash remains in solution.



Qualities.—Subcarbonate of magnesia when pure is colourless, inodorous, tasteless, and unalterable in the air; it is insoluble in water; and is decomposed by a strong heat, which expels the carbonic acid.

Composition.—Subcarbonate of magnesia, termed correctly carbonate of magnesia, is composed of

Carbonic acid 52.4	or 1 atom acid.....	=22
Magnesia....47.6	1 atom earth.....	=20
100.0	Weight of its atom	=42

Adulteration.—If not sufficiently washed, subcarbonate of magnesia may contain sulphate of potash, which will be readily

determined by dissolving it in dilute nitric acid, and adding nitrate of barytes to the solution. If it should contain any carbonate of lime, a solution of subcarbonate of ammonia will give a precipitate in the nitric solution, but not otherwise.

Incompatibles.—Acids and acidulous and metallic salts, muriate of ammonia, and lime-water.

Medicinal Uses..—Antacid and purgative, and in lithic calculi in doses of ʒj. to ʒj.

MAGNESIA.

Magnesia.

Take of Subcarbonate of Magnesia four ounces;

Burn it for two hours in a very strong fire, or until diluted acetic acid dropped in excites no bubbles.

Process.—The subcarbonate of magnesia, like the carbonate of lime, parts with its carbonic acid at a high temperature, and the magnesia remains in its pure or caustic state.

Qualities.—Colourless, inodorous, and tasteless if pure; it does not, like lime, become hot when mixed with water; it is very nearly insoluble in water, and although the moistened earth exhibits alkaline properties by turning vegetable blues green, and yellows brown, yet water in which it has been agitated does not dissolve enough to produce this effect, as lime water readily does. By exposure to the air it slowly attracts carbonic acid and is reconverted to carbonate.

Composition.—Magnesia is the oxide of a peculiar metal, called magnesium, of which it is the only oxide known; it is composed of

Magnesium	60	or 1 atom metal	=12
Oxygen	40	1 atom oxygen ..	= 8
	100	Weight of its atom	=20

Adulteration may be detected as in the subcarbonate of magnesia, and the

Incompatibles, excepting lime water, are also similar.

Medicinal Uses.—Antacid, and when acidity prevails, purgative; it is preferable to the subcarbonate whenever the bowels are distended with flatus; in other respects its virtues are the same. Dose, ʒss. to ʒj.

METALS AND THEIR SALTS.

PREPARATIONS OF ANTIMONY.

ANTIMONII SULPHURETUM PRÆCIPITATUM.

Precipitated Sulphuret of Antimony.

Take of Sulphuret of Antimony, powdered, two pounds,
Solution of Potash four pints,
Distilled Water three pints,
Diluted Sulphuric Acid as much as may be sufficient;

Mix the Sulphuret of Antimony, Solution of Potash, and Water together, and boil with a slow fire for three hours, constantly stirring, distilled Water being added frequently, that it may always fill the same measure. Strain the liquor immediately through a doubled linen cloth, and still hot, drop into it gradually, of diluted Sulphuric Acid, as much as may be sufficient to throw down the powder; then wash away the Sulphate of Potash with hot water, dry the precipitated Sulphuret of Antimony, and rub it to fine powder.

Process.—Sulphuret of antimony is composed of

Antimony..73⅓	or of	1 atom of metal	= 44
Sulphur....26⅔		1 atom of sulphur ..	= 16
100		Weight of its atom	= 60

When it is boiled in a solution of potash, as here directed, a portion of water probably suffers decomposition, the hydrogen of which combining with the sulphur appears to form sulphuretted hydrogen, and the oxygen uniting with antimony produces the protoxide of that metal. Additional experiments are, however, wanting to decide not only the nature of the product, but that also of the process by which it is obtained.

When the dilute sulphuric acid is added to the solution, it combines with the potash, forming sulphate of potash, and the antimony and sulphur are precipitated in combination.

Qualities.—This preparation is of a bright orange colour, inodorous, and of a slightly styptic taste. It is insoluble in water, and not readily acted upon by dilute acids. When boiled in a solution of twice its weight of bitartrate of potash, I find that about 12 per cent. of oxide of antimony is dissolved.

Composition.—Admitting this substance to consist principally of hydrosulphuretted oxide of antimony, it is composed of

Protoxide of antimony	12
Hydrosulphuretted oxide of antimony	88
	100

There are, however, some reasons for supposing that the portion undissolved by the bitartrate of potash is a compound of sulphuret of antimony and water, instead of an hydrosulphuretted oxide; on this view, the antimonii sulphuretum præcipitatum consists of about

Protoxide of antimony.....	12
Sulphuret of antimony.....	76.5
Water.....	11.5
	100.0

These proportions are not, however, easily reducible to any probable atomic constitution, and I repeat that further experiments are required to determine the nature of this preparation.

Officinal Preparations.—Pilulæ Hydrargyri Submuriatis Compositæ.

Medicinal Uses.—It is but seldom employed, except in the above named preparation, being less certain in its operation than other antimonials. Dose, from gr. j. to gr. iv., twice a day, in herpetic and other eruptions. In large doses it is emetic.

ANTIMONIUM TARTARIZATUM.

Tartarized Antimony.

Take of Glass of Antimony, rubbed to very fine powder,
Supertartrate of Potash, powdered, of each one pound,
Boiling Distilled Water a gallon;

Mix the Glass of Antimony with the Supertartrate of Potash, accurately, and put them into the boiling distilled Water, gradually, stirring with a spatula constantly; boil for a quarter of an hour, and set it aside. Strain the cooled liquor, and evaporate the strained liquor, that crystals may be formed.

Process.—Glass of antimony is prepared by exposing the sulphuret to heat and air, by which the sulphur is almost entirely dissipated; and the antimony, by combining with the oxygen of the air, is converted into protoxide, consisting of

Antimony..84.62	or of 1 atom of metal....	= 44
Oxygen....15.38	1 atom of oxygen ..	= 8
100.00	Weight of its atom	= 52

It is afterwards strongly heated in an earthen crucible, by combining with some of the silica of which it forms a species of glass, which is transparent, and of a red colour. It consists of protoxide of antimony combined with variable proportions of silica, and a little sulphuret. A specimen that I examined contained only five per cent. of silica, which is less than is generally mentioned.

The present process for making tartarized antimony is simple: supertartrate of potash, as already mentioned, contains excess of acid, and when a solution of it is boiled with glass of antimony, the protoxide of antimony is dissolved, while some reddish sulphuret and silica remain undissolved. The solution thus obtained consists of tartrate of potash and tartrate of antimony, and these combining form a double salt, called tartrate of potash and antimony, or tartarized antimony.

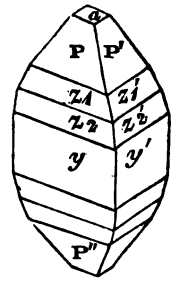
Tartarized Antimony, or
Tartrate of Potash and Tartrate of Antimony.

Supertartrate or Bitartrate of Potash { 2 atoms Acid. 1 atom Potash. } Protoxide of Antimony. } Glass of Antimony.

Sulphuret of Antimony, and Silica.

It is better to use about one-tenth more glass of antimony than directed; and as this compound is very readily obtained and at a moderate price, there is only this objection to its employment, viz. that glass of lead is sometimes mixed with, and occasionally altogether substituted for it; and their appearance is so similar, that the most experienced eye may be deceived: it is, however, easy to distinguish these substances by their chemical characters. I have stated that the undissolved portion of glass of antimony is of a reddish colour; but when glass of lead is boiled in a solution of supertartrate of potash, it is very soon rendered black, and scarcely any of it is dissolved. It is also easily detected by heating it in dilute nitric acid: if the solution contain lead, sulphuric acid will occasion a white precipitate in it. The specific gravity also of glass of antimony is about 4.950, while that of glass of lead is 6.950; or in round numbers their densities are as 5 to 7.

Qualities.—Tartarized antimony crystallizes with great facility, and the general character of the crystals of this compound is that of an *octahedron with a rhombic base.* One distinct cleavage only has been obtained, which is parallel to the plane *a* of the accompanying figure. The planes *z* and *y* are generally striated.



The following are the nearest to coinciding measurements taken on several crystals:

P on P′	108°	16′
P over the edge on the left	104	15
P on z_1	166	40
P on z_2	165	40 nearly
a on P, or P′	122	00
a on y	90	00

The crystals of this salt are colourless and inodorous, but have a styptic metallic taste: on exposure to the air, they effloresce slightly, and become opaque. When heated with carbonaceous matter this salt is decomposed, and an alloy of antimony and potassium is obtained. It is soluble in about fifteen times its weight of water at 60°, and twice its weight at 212°. The aqueous solution decomposes spontaneously after it has been some time prepared. It is insoluble in alcohol.

Composition.—I find that this salt, correctly termed tartrate of potash and antimony, is composed of

Tartaric Acid	36.4	or 2 atoms of acid	66×2=132
Potash	13.2	1 atom of potash	= 48
Protoxide of Antimony	43.0	3 atoms of oxide	52×3=156
Water	7.4	3 atoms of water	9×3= 27
	100.0	Weight of its atom	=363

Or it may be regarded as constituted of

One atom of tartrate of potash	114
One atom of tristartrate of antimony	222
Three atoms of water	27
	363

Adulteration.—This salt should never be purchased in powder, but always in crystals: in the former state it frequently contains a portion of supertartrate of potash uncombined with any oxide of antimony, and which, in preparing the liquor antimonii tartarizati, is precipitated. To judge if the crystals have been properly prepared, drop one or two into a solution of sulphuretted hydrogen gas, and an orange-coloured deposite will be formed on them.

Incompatibles.—The solution of this salt is decomposed by acids, by alkalies and their carbonates, by some of the earths and metals, and their oxides, by lime water, muriate of lime, and the acetates of lead. Many vegetable infusions, and especially those which are bitter and astringent, decompose it, such as cinchona, rhubarb, catechu, &c.

Medicinal Uses.—Tartarized antimony either sweats, vomits, or purges, according to the quantity exhibited. A *quarter of a grain*, if the skin be kept warm, will promote a diaphoresis; *half a grain* will first prove purgative, and then diaphoretic; and *one grain* will generally vomit, then purge, and lastly sweat the patient. It may be given in solution.

VINUM ANTIMONII TARTARIZATI.

Wine of Tartarized Antimony.

Take of Tartarized Antimony a scruple,
Boiling Distilled Water eight fluidounces,
Rectified Spirit two fluidounces;
Dissolve the Tartarized Antimony in the boiling distilled Water; then add the spirit to the strained liquor.

Process.—The College have substituted diluted spirit for wine in this and several other preparations. When tartarized antimony has been carelessly prepared, and contains supertartrate of potash uncombined with oxide of antimony, it is precipitated from solution in water, by spirit; those practitioners, therefore, who purchase tartarized antimony, should insist on having it in the state of crystals, in which there is but little chance of the occurrence of this imperfection. A fluidounce of this preparation contains two grains of tartarized antimony. If any deposite should be observed in this solution, it ought to be rejected.

Medicinal Uses.—Each fluidounce of this preparation contains two grains of tartarized antimony; in doses of from ten to thirty drops it acts as a diaphoretic when given with saline medicines, warm drinks, &c.

PULVIS ANTIMONIALIS.

Antimonial Powder.

Take of Sulphuret of Antimony, powdered, a pound,
Horns, shaved, two pounds;

Mix and throw them into a wide crucible red hot in the fire, and stir constantly until visible vapour no longer arises. Rub that which remains to powder, and put it into a proper crucible; then apply fire, and increase it gradually that it may be red hot for two hours. Rub the residue to very fine powder.

Process.—Sulphuret of antimony, as already mentioned, consists of sulphur and antimony; horn shavings are composed of phosphate of lime mixed with carbonaceous animal matter. When the sulphuret and horn are heated together, the sulphur is expelled in vapour; and the antimony, combining with the oxygen of the air, is converted into oxide of antimony. Part of the animal matter is dissipated by the heat, but the phosphate of lime suffers no change; there remains, therefore, in the crucible, a mixture of oxide of antimony and phosphate of lime, forming Pulvis Antimonialis.

Qualities.—Pulvis antimonialis is an inodorous insipid powder, of a dull white colour. It is insoluble in water, and only partially soluble in acids; if, however, the antimony it contains were in the state of protoxide, as has been stated, then muriatic acid, when heated, would dissolve it entirely.

Composition.—In consequence of Dr. Elliotson's statement, that he had exhibited upwards of 100 grains of pulvis antimonialis without producing any effect, I procured specimens of this preparation from two respectable sources, and subjected them to analysis. I found one of them to consist of

Peroxide of antimony	35
Phosphate of lime	65
	100

The other yielded

Peroxide of antimony	38
Phosphate of lime	62
	100

According to Dr. Latham 60 grains of peroxide of antimony may be exhibited for a dose; and Dr. Duncan states that it is perfectly inert; the analysis of this preparation fully accounts, therefore, for its inefficiency. It appears, however,

from Mr. Brande's statement, that pulvis antimonialis is worse than powerless, for it is uncertain; he mentions that it sometimes contains peroxide of antimony; on other occasions, a portion of protoxide; and in some few cases nearly all the oxide of antimony had been volatilized, so that little but phosphate of lime was left.

I have also analyzed James's Powder, of which the pulvis antimonialis is a professed imitation: I found it to consist nearly of

Peroxide of antimony.....	56
Phosphate of lime	44
	100

These proportions agree almost exactly with the results obtained by Dr. Pearson; and it is evident that it is as inert a preparation as the pulvis antimonialis. The peroxide of antimony contained in these medicines consists of

Antimony....$73\frac{1}{3}$	or 1 atom of metal	= 44
Oxygen.....$26\frac{2}{3}$	2 atoms of oxygen ..	= 16
100	Weight of its atom	= 60

Pulvis antimonialis appears to differ chiefly from the antimonium calcinatum omitted in the Pharmacopœia of 1809, in being mixed with a large quantity of phosphate of lime.

Adulteration.—No doubt can be entertained that this preparation, like every other, has been sophisticated; but owing to want of power in the genuine article, the practitioner probably has not been disappointed by its adulteration.

Medicinal Uses.—It is stated to be diaphoretic, alterative, emetic, or purgative, according to the extent of the dose and the state of the patient. The doses mentioned are from gr. v. to gr. x. It is worth the consideration of the practitioner, whether the use of this preparation may not be altogether superseded by that of tartarized antimony.

PREPARATION OF SILVER.

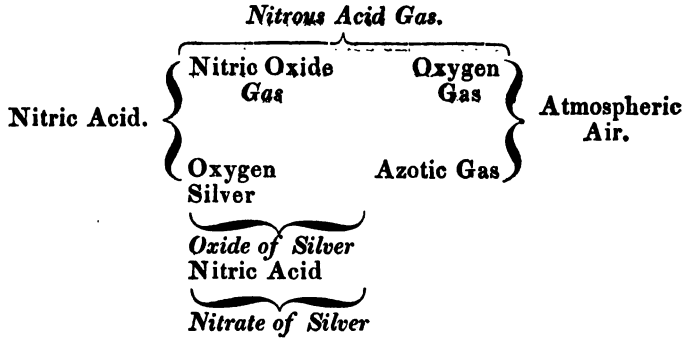
ARGENTI NITRAS.

Nitrate of Silver.

Take of Silver an ounce,
Nitric Acid a fluidounce,
Distilled Water two fluidounces;

Mix the Nitric Acid with the Water, and dissolve the Silver in them, in a sand bath. Afterwards increase the heat gradually, that the Nitrate of Silver may be dried. Liquefy this in a crucible, with a slow fire, until, the Water being expelled, ebullition has ceased; then immediately pour it into proper moulds.

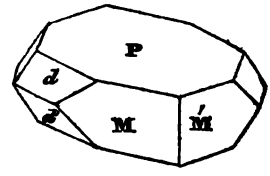
Process.—Nitric acid is composed of oxygen and azote, and when silver is dissolved in it, a portion of the acid is partially decomposed into nitric oxide gas and oxygen; the former escapes into the atmosphere, and separating a portion of its oxygen from admixture with the azotic gas, red nitrous acid gas is formed by their union. The oxygen of the decomposed acid unites with the silver to form oxide of silver, and this is dissolved by the nitric acid undecomposed, and converted into nitrate of silver.



The quantity of nitric acid is too large, for it is capable of dissolving nearly one half more silver than is directed.

Qualities.—Solution of nitrate of silver readily yields transparent colourless crystals, the primary form of which is *a right rhombic prism.*

P on *d*	116°	36′
M on *d*	148	0
M on M′	129	31
d on *d*′	126	48



In some crystals the planes *d* are barely visible, while in others those planes encroach so much on M and M′ as to leave only minute portions of them discernible.

Water, at the temperature of 60°, dissolves its own weight of this salt. It is not deliquescent. By exposure to a strong light it becomes brown, owing to the reduction of a part of the silver to the metallic state. When moderately heated it readily melts, swells, and then remains liquid. On cooling it forms a grey coloured mass, having a striated and crystalline structure. If subjected to a red heat it is decomposed. It stains the skin black: the crystals contain no water.

Composition.—Nitrate of silver is composed of

Nitric acid	31.39	or 1 atom of acid	= 54
Oxide of silver	68.61	1 atom of oxide	= 118
	100.00	Weight of its atom	= 172

Adulteration.—Fused nitrate of silver is very commonly of a dark colour; this may have been caused by its exposure to light, or by its fusion at too high a temperature, in both which cases the nitrate is partly decomposed. The dark colour may also depend upon the use of silver containing copper, the peroxide of which is nearly black. To detect this, add a solution of ammonia to one of the suspected nitrate of silver: if it contain copper, a deep blue compound will be formed. Lunar caustic may possess a dark colour without much diminution of its power; but it is better that it should be greyish white.

Incompatibles.—Almost all spring and river water, soaps; potash, soda, and their carbonates, lime water; the sulphuric, muriatic, and tartaric acids, and the salts which contain them, decompose a solution of nitrate of silver. Ammonia does not produce any precipitation, but its carbonate does; it is

also decomposed by liquor arsenicalis, sulphuretted hydrogen and hydro-sulphurets, and astringent vegetable infusions.

Medicinal Uses.—It is the most manageable and powerful of all escharotics. Internally it is tonic and antispasmodic, and has been especially exhibited in cases of epilepsy; when it has been long taken, it is sometimes deposited in the rete mucosum, so as to give a permanent dark purple hue to the patient. Dose, *one-eighth of a grain* gradually increased to *one grain*. But very much larger doses have been given. It should be made into pills with crumb of bread, and mixed with a little sugar to prevent the mass from becoming too hard.

PREPARATIONS OF ARSENIC.

ARSENICUM ALBUM SUBLIMATUM.

Sublimed White Arsenic.

Rub White Arsenic to powder; then put it into a crucible, and fire being applied, sublime it into another crucible placed upon the former.

Process.—This operation appears to be unnecessary, for it is impossible for white arsenic to be purer than as it is met with in the shops in large masses, which, externally, are usually opaque; but internally, when recently broken, they are semitransparent, and have the appearance of a yellowish glass.

Qualities.—White arsenic, called also oxide of arsenic, and arsenious acid, is moderately hard and brittle, it is inodorous; has hardly any taste, and is extremely poisonous. Its specific gravity, when transparent, I find to be 3.715, and when opaque 3.260; the opacity I believe to be owing to the absorption of water from the atmosphere. Arsenious acid is volatilized at the temperature of about 380°, and when thus vaporized, it is inodorous, although usually stated to possess an alliaceous smell, which belongs only to volatilized metallic arsenic. A thousand parts of water at a mean temperature are said to dissolve 9.6 parts of transparent and 12.5 of opaque

arsenious acid in 36 hours; the same quantity of boiling water dissolves 97 parts of the transparent kind, of which 18 are retained on cooling and 79 deposited in the state of small crystals, the form of which is the regular octahedron. The solution of white arsenic reddens litmus paper slightly, and it combines with the alkalies potash and soda, with great facility, on which accounts it is usually termed arsenious acid; when heated in nitric acid it absorbs more oxygen, is rendered much more powerfully acid, and is then called arsenic acid.

Composition.—Arsenious acid, or white arsenic, is a compound of the metallic body arsenic and oxygen, in the proportions of

Arsenic 70.37	or 1 atom of metal.....	=	38
Oxygen 29.63	2 atoms of oxygen .. 8×2	=	16
100.00	Weight of its atom	=	54

LIQUOR ARSENICALIS.

Arsenical Solution.

Take of Sublimed White Arsenic, rubbed to a very fine powder,
Subcarbonate of Potash, from Tartar, of each sixty-four grains,
Compound Spirit of Lavender four fluidrachms
Distilled Water a pint;

Boil the White Arsenic and Subcarbonate of Potash with the Water in a glass vessel, until all the Arsenic is dissolved. To the cooled liquor add the Compound Spirit of Lavender. Lastly, add besides, of distilled Water, as much as may be sufficient, that it may accurately fill a pint measure.

Process.—This is a solution of arsenite of potash, and during ebullition carbonic acid gas is evolved, owing to the greater affinity existing between the arsenious acid and potash, than between carbonic acid and potash.

In preparing Liquor Arsenicalis, the white arsenic usually sold in powder should not be employed; it is very commonly adulterated with sulphate of lime or gypsum, which renders the solution weaker, and being insoluble in the subcarbonate of potash, the operator supposes that it is difficult to prepare the liquor arsenicalis. This adulteration, and most others likely to occur in white arsenic, may be detected by heating the powder in a crucible; whatever is not volatilized is an impurity.

The subcarbonate of potash, prepared in the usual mode, answers the purpose perfectly; and the arsenious acid so readily dissolves in the heated solution of it, that if reduced only to a coarse powder, it disappears in a few minutes after the commencement of ebullition.

Incompatibles.—Acids and acidulous salts, sulphuret of potash and similar compounds, lime water; earthy salts, such as alum, sulphate of magnesia, and muriate of lime; metallic salts, as sulphate and muriate of iron, nitrate of silver, and sulphate of copper; decoction of cinchona.

Medicinal Uses.—This solution is a powerful tonic: it is especially employed in intermittent and remittent fevers, periodic head-aches, and some diseases of the skin. Dose, *four minims to thirty minims*, twice a day.

PREPARATION OF BISMUTH.

BISMUTHI SUBNITRAS.

Subnitrate of Bismuth.

Take of Bismuth an ounce,
Nitric Acid a fluidounce and a half,
Distilled Water three pints;

Mix six fluidrachms of the distilled Water with the Nitric Acid, and dissolve the Bismuth in them; then strain. Add that which remains of the Water to the strained liquor, and set it by, that the powder may subside.

Afterwards, the supernatant liquor being poured off, wash the Subnitrate of Bismuth with distilled Water, and dry it, wrapped in bibulous paper, with a gentle heat.

Bismuth is a metal of a reddish white colour, its structure is usually crystalline, and by cautious cooling after it has been melted, it may be made to assume the cubic form. It is a brittle metal; its specific gravity is 9.882; it melts at the temperature of 476°.

Process.—In preparing the nitrate of bismuth, part of the nitric acid is decomposed, with the occurrence of phenomena and effects similar to those which have been described, as taking place during the solution of silver in the same acid. The oxide of bismuth formed is held in solution by the nitric acid remaining undecomposed; it consists of

Bismuth....90	or 1 atom of metal	=	72
Oxygen 10	1 atom of oxygen	=	8
100	Weight of its atom	=	80

The solution of nitrate of bismuth is colourless, and when water is added to it, as directed in the Pharmacopœia, it combines with the greater part of the acid; and the oxide of bismuth is precipitated, in combination with a little nitric acid, forming subnitrate of bismuth, which I find to be composed of

Nitric acid.....18.36	or 1 atom of acid	=	54
Oxide of bismuth ..81.64	3 atoms of oxide..80×3	=	240
100.00	Weight of its atom	=	294

It is therefore a trisnitrate.

Qualities.—This substance was formerly employed as a cosmetic, under the name of magistery of bismuth. It is a white, inodorous, tasteless powder, insoluble in water. It is rendered black by sulphuretted hydrogen and its compounds.

Medicinal Uses.—This medicine is represented to possess antispasmodic powers, and to be especially serviceable in those forms of dyspepsia, which are attended with painful contractions of the stomach. Dose, from gr. v. to gr. xv.

PREPARATIONS OF COPPER.

CUPRUM AMMONIATUM.

Ammoniated Copper.

Take of Sulphate of Copper half an ounce,
Subcarbonate of Ammonia six drachms;
Rub them together in a glass mortar, until the effervescence has ceased; afterwards dry the Ammoniated Copper, wrapped in bibulous paper, with a gentle heat.

Process.—Sulphate of copper (properly bipersulphate) is a well known crystallized salt, of a fine blue colour; it consists of

Sulphuric acid	32
Peroxide of copper	32
Water	36
	100

When the sulphate of copper is mixed with the subcarbonate (sesquicarbonate) of ammonia, double decomposition takes place, sulphate of ammonia and carbonate of copper being formed; this, at least, is what I now believe to occur, though I formerly thought, that subsulphate of copper was one of the new compounds resulting from the mutual action of these salts. Effervescence arises during the trituration, from two causes; the sulphate of copper contains excess of acid, and so also does the sesquicarbonate of ammonia, and there being, consequently, more carbonic acid set free, than the peroxide of copper can combine with, it is evolved in the gaseous state.

This preparation, however, is usually not a mere mixture of carbonate of copper and sulphate of ammonia, for the ammonia of the subcarbonate is sufficient to saturate three times the quantity of sulphuric acid in the sulphate of copper; there is probably, therefore, some excess of subcarbonate of

ammonia, the proportion of which must depend upon the temperature at which the medicine is dried.

Qualities.—Cuprum ammoniatum has a very fine azure blue colour, which is more intense when it has been very gently dried, so as to leave some excess of subcarbonate of ammonia; its smell is then ammoniacal. Its taste is styptic and metallic.

Incompatibles.—This preparation is incompatible with acids, the alkalies potash and soda, and with lime water.

Officinal Preparations.—Liquor Cupri Ammoniati.

Medicinal Uses.—It is tonic and antispasmodic. It has been employed in chorea, and also advantageously in epilepsy. Dose, *one quarter of a grain*, cautiously increased to *five grains*, twice a day. It is given in the form of pills, made up with crumb of bread.

LIQUOR CUPRI AMMONIATI.

Solution of Ammoniated Copper.

Take of Ammoniated Copper a drachm,
Distilled Water a pint;
Dissolve the Ammoniated Copper in the Water, and filter through paper.

Qualities.—This solution has a fine blue colour, but unless the cuprum ammoniatum has some excess of subcarbonate of ammonia, I have found that it is decomposed, and one half of the oxide of copper precipitated, by so large a quantity of water as here directed; whereas a smaller portion dissolves it perfectly.

Medicinal Uses.—It is detergent and mildly escharotic. When still more largely diluted, it is employed for removing specks from the cornea.

PREPARATIONS OF IRON.

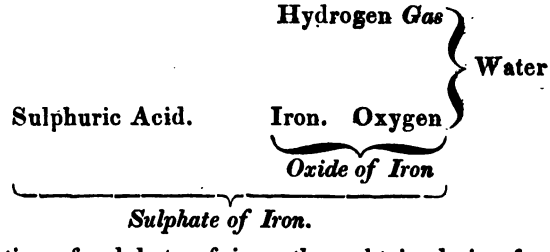
FERRI SULPHAS.

Sulphate of Iron.

Take of Iron,
Sulphuric Acid, each, *by weight*, eight ounces,
Water four pints;

Mix the Sulphuric Acid with the Water in a glass vessel, and add the Iron to them; then, when bubbles have ceased to escape, strain the solution through paper, and evaporate it over the fire, so that while it cools, crystals may be formed; the liquor being poured off, dry these upon bibulous paper.

Process.—Concentrated sulphuric acid and iron do not act upon each other at common temperatures, but if the acid be diluted with water, rapid action takes place. Water consists of oxygen and hydrogen, and a portion of it is decomposed by the action of the sulphuric acid and iron. Its oxygen combines with the iron to form oxide of iron, and its hydrogen being set at liberty, assumes the elastic form and is evolved in the state of gas. The oxide of iron is dissolved by the sulphuric acid, and sulphate of iron is formed.



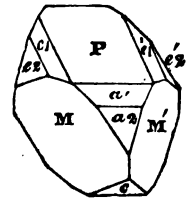
The solution of sulphate of iron thus obtained, is of a blueish green colour, the iron being in the state of protoxide; if it be long exposed to the air, it first loses its blue

tint, owing to the absorption of oxygen, which converts the protoxide into peroxide of iron, and eventually it becomes of a red colour.

The quantity of sulphuric acid directed to be used, is less than that required to dissolve the iron, nearly in the proportion of 8 to 15.

Qualities.—The primary form of sulphate of iron is *an oblique rhombic prism*, M M′ and P of the annexed figure being the primary planes, the crystals sometimes exhibit the secondary planes *a* and *e*.

P on M, or M′	99°	20′
M on M′	82	20
P on e_1	153	00
P on e_2	123	55
P on a_1	159	00
P on a_2	136	10



The crystals, when recently formed, are of a blueish green colour; by exposure to the air, the protoxide of iron which the salt contains attracts oxygen, and the yellow colour of the peroxide of iron formed, renders the crystals green by admixture with the blue protosulphate of iron. When the exposure has been long continued, the surface of the crystals is encrusted with peroxide of iron, and they ought then to be rejected; the solution, as already noticed, attracts oxygen, and it is rendered first green and then red, depositing at the same time a considerable quantity of subpersulphate of iron.

Sulphate of iron has a disagreeable styptic taste; it is soluble in about two parts of cold water and 3-4ths of its weight of boiling water. The solution is precipitated of a greenish white by alkalies, the oxide thrown down, gradually absorbs oxygen, and becomes red, or peroxide of iron; when free from peroxide of iron, the ferrocyanate of potash occasions a white precipitate which becomes speedily blue by exposure to the air. When the solution has absorbed oxygen by the action of the air, or by any other means, it then gives immediately a deep blue precipitate with the same test, and a black one with astringent vegetable infusions and tinctures.

By exposure to a moderate heat the crystals lose 6-7ths of their water, their crystalline form, and become white and powdery; subjected to a strong heat they are decomposed, yielding a peculiar kind of sulphuric acid, and peroxide of iron.

Composition.—There are two oxides of iron, the black or protoxide, and the red or peroxide; this salt contains vari-

able quantities of the latter. They consist of the following proportions of iron and oxygen:—

Oxide or Protoxide.

Iron.....	77.7	or 1 atom.....	= 28
Oxygen	22.3	1 atom.....	= 8
	100.0	Weight of its atom	= 36

Red or Peroxide.

Iron	70	or 2 atoms.....	= 56
Oxygen	30	3 atoms.....	= 24
	100	Weight of its atom	= 80

The peroxide of iron is that which exists in the Ferrum Tartarizatum, and some other preparations presently to be noticed. Sulphate of iron consists of

Sulphuric acid	28.8	or 1 atom of acid	= 40
Protoxide of iron..	25.9	1 atom of oxide.....	= 36
Water.....	45.3	7 atoms of water	= 63
	100.0	Weight of its atom	=139

Adulteration.—Copperas, or green vitriol, is an impure sulphate of iron employed in the arts, and often improperly used for medicinal purposes, instead of that prepared directly from iron and dilute sulphuric acid, as directed. It is of a green colour, shewing that it contains much peroxide of iron: and sometimes it contains oxide of copper; the latter may be detected by immersing in a solution a clean polished plate of iron, upon which the copper will be deposited in its metallic state.

Incompatibles.—Ammonia, potash, soda and their carbonates, lime water, and muriate of lime, nitrate of silver, the acetates of lead, and soaps. The salts of barytes and strontia, as well as the earths they contain, are incompatible with this salt. It is decomposed also by astringent vegetable bodies.

Officinal Preparations.—This salt is employed in preparing Ferri Subcarbonas, Mistura Ferri Composita, and Pilulæ Ferri Compositæ.

Medicinal Uses.—Tonic, astringent, emmenagogue, and anthelmintic; in large doses, it occasions griping in the

bowels. Dose, gr. j. to v. or more, made into pills with extract of gentian. It should never be given in solution, without previously boiling the water, to free it from atmospheric air, the oxygen of which is readily absorbed, and the sulphate of iron is decomposed by it.

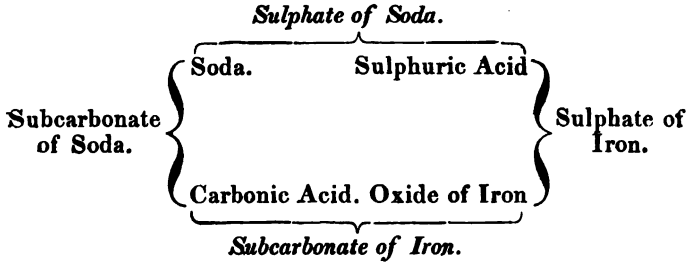
FERRI SUBCARBONAS.

Subcarbonate of Iron.

Take of Sulphate of Iron eight ounces,
Subcarbonate of Soda six ounces,
Boiling Water a gallon;

Dissolve, separately, the Sulphate of Iron and the Subcarbonate of Soda, in four pints of the Water; then mix the liquors together, and set them by, that the powder may subside; afterwards, the supernatant liquor being poured off, wash the Subcarbonate of Iron with hot water, and dry it, wrapped in bibulous paper, with a gentle heat.

Process.—The quantity of subcarbonate of soda is too small to decompose the sulphate of iron, in the proportion of 6 to 8.3. When the solutions are mixed, double decomposition takes place. The carbonic acid of the subcarbonate combines with the oxide of iron of the sulphate, and the subcarbonate of iron formed being insoluble in water, it is precipitated; the soda of the subcarbonate unites with the sulphuric acid of the sulphate of iron, and the sulphate of soda resulting being soluble, remains in solution.



Composition and Qualities.—Carbonate, or rather protocarbonate of iron, consists of

Carbonic acid....38	or 1 atom of acid	= 22
Protoxide of iron 62	1 atom of oxide	= 36
100	Weight of its atom	= 58

When this medicine has been prepared with the greatest care, I have found that it contains 15 per cent. of carbonic acid, which indicates its composition to be

Protocarbonate of iron	40
Peroxide of iron	60
	100

I have procured this preparation from several respectable sources, but never found it to contain five per cent. of carbonate of iron: the reason of this is, that unless it be washed with hot water, and then speedily dried, the protoxide of iron absorbs oxygen, and being converted into peroxide, it is no longer capable of remaining combined with carbonic acid; for although carbonic acid may exist in combination with peroxide of iron in solution, yet a solid percarbonate of iron cannot be formed.

According to what I have just stated, this preparation as usually met with consists of about

Protocarbonate of iron	4
Peroxide of iron	96
	100

From the great affinity which exists between iron and oxygen, and from the rapidity with which the protoxide absorbs it, so as to form peroxide, it seems to be impossible to procure a perfect carbonate of iron.

Ferri subcarbonas, when it has been carefully made, has a reddish brown colour; it dissolves readily in acids with effervescence, and yields 15 per cent. of carbonic acid during solution. When improperly prepared it contains smaller and variable proportions of carbonic acid, its colour is less brown, and it is not so easily dissolved by acids.

When this preparation contains a large proportion of carbonic acid, it is much more readily soluble, and its activity

as a medicine is probably proportional to the quantity of that acid present.

Incompatibles.—Acids and acidulous salts, which dissolve it with effervescence.

Officinal Preparations.—Ferrum Ammoniatum, Tinctura Ferri Muriatis.

Medicinal Uses.—Tonic and emmenagogue. Dose, from gr. v. to xxx. combined with myrrh or aromatics. In doses of half a drachm to a drachm, two or three times a day, it is said to have proved efficacious in tic doloreux. In doses of ʒi. to ʒiv. it is stated to have afforded relief in chorea.

TINCTURA FERRI MURIATIS.

Tincture of Muriate of Iron.

Take of Subcarbonate of Iron half a pound,
Muriatic Acid a pint,
Rectified Spirit three pints;

Pour the Acid upon the Subcarbonate of Iron in a glass vessel, and shake it frequently for three days. Set it by, that the dregs, if there be any, may subside; afterwards pour off the liquor, and add the Spirit to it.

Process.—The muriatic acid decomposes the carbonate of iron, expelling the carbonic acid gas with effervescence, dissolving the protoxide of iron with which it was combined, and also the peroxide of iron. I find that the proportions here directed answer extremely well, for less than one scruple of the subcarbonate of iron remains undissolved, including the accidental impurity which it may contain.

When this tincture is made with subcarbonate of iron, containing 15 per cent. of carbonic acid, it is a mixed solution of protomuriate and permuriate of iron in spirit; and its preparation from carbonate of iron is attended with this inconvenience, that the protoxide of iron becomes peroxide by absorbing oxygen, and part of it is precipitated, which renders the tincture liable to diminish and vary in strength.

As Tinctura Ferri Muriatis is esteemed to be one of the most active of all the preparations of iron, I have paid par-

ticular attention to the preparation of it, and have procured it from several respectable sources, for the purpose of examining the proportion of iron which it contains.

The specific gravity of four different samples, and the proportions of peroxide of iron obtained from half a fluidounce of each, were as follows:—

No. 1,	sp. gr. 1.030	Peroxide of iron 20 grains.
2,	0.975	11.3
3,	0.951	9.3
4,	1.003	12.1

Finding these great variations in the specific gravities, and the quantities of oxide contained in these samples, I prepared some of the tincture precisely according to the directions of the College, and found its sp. gr. and the peroxide of iron yielded by half a fluidounce, were as follows:—

Specific gravity 0.994 Peroxide of iron 16.8 grains.

It is difficult to account for the excess of iron in the sample No. 1, but the deficiency of the remainder is readily explained by supposing, that the muriatic acid employed was too weak to dissolve the assigned portion of the subcarbonate of iron.

Qualities and Composition.—This tincture is of a reddish brown colour, its taste is extremely styptic and acid, and its odour resembles that of muriatic ether. When prepared, as it usually is, from peroxide of iron nearly unmixed with carbonate, it is almost entirely permuriate of iron, and each fluidrachm contains nearly 4.2 grains of peroxide of iron.

Incompatibles.—Alkalies and their carbonates, lime water, carbonate of lime, magnesia and its carbonate. It is rendered black by astringent vegetable bodies, and is decomposed by a solution of gum arabic.

Medicinal Uses.—When made with proper care, it is one of the most certain and active preparations of iron; for the metal being in the state of peroxide, it remains for a very long time without suffering any variation of strength from decomposition. Dose, ♏ x. to ♏ xxx. or ʒj.

It is stated to be particularly useful as a tonic in scrofula; in dysuria, ♏ x. given every ten minutes until some sensible effect is produced, afford speedy relief; and it is a powerful styptic in hæmorrhage from the bladder, kidneys, or uterus. It is used externally as a styptic in cancerous and fungous sores, and for the purpose of destroying venereal warts.

FERRUM AMMONIATUM.

Ammoniated Iron.

Take of Subcarbonate of Iron,
Muriatic Acid,
Muriate of Ammonia, each, a pound;

Pour the Muriatic Acid upon the Subcarbonate of Iron, and set them aside, until bubbles are no longer excited. Strain the liquor through paper, and boil down the strained liquor, until all the moisture is evaporated. Mix that which remains, carefully, with the Muriate of Ammonia: then, a strong fire being applied, sublime immediately: lastly, rub it to powder.

Process.—In this preparation, as in the last, the subcarbonate of iron is decomposed by the muriatic acid; and the dry muriate of iron obtained by evaporation is to be sublimed in mixture with muriate of ammonia. From what has been stated of the accuracy of the proportions of subcarbonate of iron and muriatic acid employed in preparing the Tinctura Ferri Muriatis, it will appear, that in this case, a large proportion of the subcarbonate of iron must remain undissolved. In the former preparation the proportions are six parts, by weight, of the subcarbonate, to rather more than 17½ of muriatic acid; in this, equal weights are directed to be used, and, consequently, but little more than one-third of the subcarbonate of iron will be dissolved.

I attempted to form Ferrum Ammoniatum by subliming a mixture of the two muriates; but I did not succeed in obtaining a good product. The evaporation of the solution of muriate of iron is an extremely unpleasant operation, and should be conducted under a chimney.

Ferrum ammoniatum is, I believe, usually prepared by mixing powdered muriate of ammonia with a solution of permuriate of iron, and evaporating the mixture to dryness; in this case it is a yellow powder, its taste is styptic and saline. When prepared by sublimation it has an orange colour.

Composition.—This preparation appears to be a mixture of muriate of ammonia, and permuriate (or perhaps perchloride) of iron. I have examined two specimens of it, in order to

ascertain the quantity of peroxide of iron which it yields; the first of these had an orange colour, and, I have no doubt, was prepared by sublimation; the other was yellow, and procured, I believe, by evaporation:—

No. 1, 200 grains gave 3 grains of peroxide of iron
2, 200 do. 2.1 grains of do.

If muriate of ammonia increases the medicinal powers of iron, it would I think be better to prepare Ferrum Ammoniatum by boiling to dryness a mixed solution of muriate of ammonia and permuriate of iron. Dr. Paris justly observes that this preparation is so uncertain in its composition and effects, that it is rarely used; to these reasons for its disuse, may be added the small quantity of oxide of iron which it contains, compared with that of muriate of ammonia.

Incompatibles.—This preparation is decomposed by the alkalies and their carbonates, the peroxide of iron being precipitated, and ammonia evolved; lime water produces a similar effect; and like other preparations of iron it is rendered black by astringent vegetable infusions.

Officinal Preparations.—Tinctura Ferri Ammoniati.

Medicinal Uses.—It is stated to be tonic, emmenagogue, and aperient. Its dose may be estimated by what I have mentioned respecting its composition.

TINCTURA FERRI AMMONIATI.

Tincture of Ammoniated Iron.

Take of Ammoniated Iron four ounces,
Proof Spirit a pint;
Digest and strain.

Process.—This is a mere solution of ammoniated iron, and an extremely weak preparation. I examined three samples of it obtained from different sources, and found that a fluid-ounce and a half of the strongest contained only 3.9 grains of peroxide of iron; the next in power yielded only 1.5 grain, and the weakest 1.1 grain. To exhibit, therefore, as much oxide of iron as is contained in a fluidrachm of tinctura ferri muriatis, nearly f℥xiii. of the strongest of these tinctures must be given.

Incompatibles.—See Ferrum Ammoniatum.

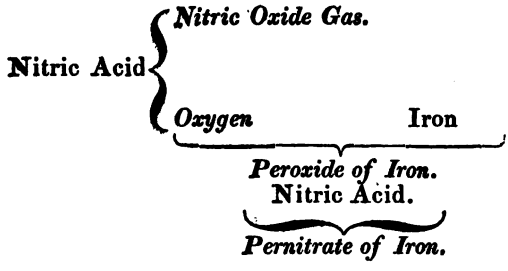
LIQUOR FERRI ALKALINI.

Solution of Alkaline Iron.

Take of Iron two drachms and a half,
Nitric Acid two fluidounces,
Distilled Water six fluidounces,
Solution of Subcarbonate of Potash six fluidounces;

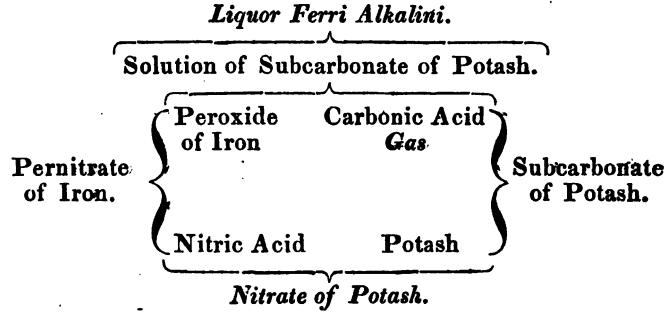
Pour the Acid and Water, mixed together, upon the Iron; then, when bubbles have ceased to escape, pour off the liquor still acid. Add this gradually and at intervals, to the solution of Subcarbonate of Potash, frequently shaking it, until, a brownish red colour being produced, bubbles are no longer excited. Lastly, set aside for six hours, and pour off the liquor.

Process.—Nitric acid is composed of oxygen and azote, and a portion of it is partially decomposed by the iron into nitric oxide, which assumes the state of gas, and oxygen, with which the metal unites and forms peroxide of iron, and this being dissolved by the nitric acid remaining undecomposed, pernitrate of iron results.



This solution of pernitrate of iron, with excess of acid, when poured into the solution of subcarbonate of potash, occasions effervescence to take place; carbonic acid is evolved, and the peroxide of iron, which is for a moment precipitated, is re-dissolved by the undecomposed subcarbonate of potash; the solvent power of which is probably

increased by its retaining a part of the carbonic acid, resulting from the decomposition of a portion of it. Nitrate of potash is formed by the union of the nitric acid and potash, and crystals of this salt are formed, from this the clear solution, which is Liquor Ferri Alkalini, still retaining some nitrate of potash, is to be poured off.



Qualities.—This preparation has a deep red colour; it is inodorous, its taste is styptic and alkaline. It is readily decomposed by water, which precipitates the peroxide of iron entirely, and leaves subcarbonate and nitrate of potash in solution. Dr. Paris observes, "that it is a very injudicious preparation, for it cannot be exhibited in any form without decomposition;" to which may be added, that it nearly resembles the Mistura Ferri composita, when that has been so long and so improperly kept, as that the protocarbonate of iron, which is at first precipitated of a greenish colour, is converted into reddish yellow peroxide.

Composition.—It is difficult to state in what mode the constituents of this preparation are combined; it may, perhaps, be a double salt, composed of peroxide of iron and carbonate of potash; at any rate it consists essentially of a solution of the peroxide in the alkaline carbonate. It is necessary to use about one-twelfth more of the solution of subcarbonate of potash than is directed; and then each fluidrachm of the solution contains nearly 2 grains of peroxide of iron; which is to that contained in an equal quantity of tinctura ferri muriatis, about as 2 to 4.2; but its efficacy is probably in a much smaller proportion, on account of the insolubility of the peroxide of iron, which must necessarily be precipitated from it previously to exhibition.

Medicinal Uses.—Tonic, emmenagogue. Dose, f℥ss. to f℥j.

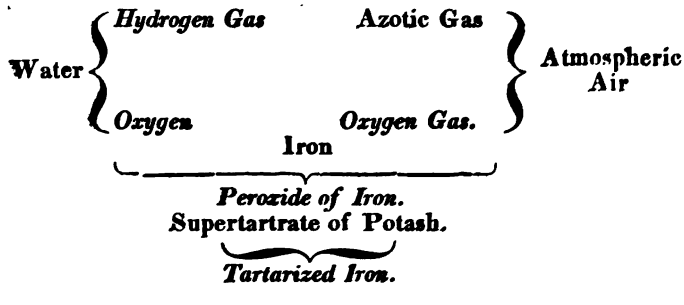
FERRUM TARTARIZATUM.

Tartarized Iron.

Take of Iron a pound,
Supertartrate of Potash, powdered, two pounds,
Distilled Water five pints, or as much as may be sufficient;

Rub the Iron and the Supertartrate of Potash together, and expose them in an open glass vessel with a pint of the Water for twenty days to the air, stirring daily, distilled Water being frequently added that they may be always moist. Then boil them with four pints of distilled Water for a quarter of an hour, and strain. Evaporate the liquor in a water bath, until the Tartarized Iron is perfectly dried. Rub this to powder, and keep it in a well stopped vessel.

Process.—The excess of acid in the supertartrate of potash acts upon and dissolves the iron, converted into protoxide by decomposing a portion of the water, the hydrogen of which is given out in the state of gas; during the exposure to the air, the protoxide of iron absorbs an additional portion of oxygen from the air of the atmosphere; so that, while hydrogen gas is first evolved by the decomposition of the water, azotic gas is afterwards set free by the decomposition of atmospheric air.



Qualities.—This preparation is of a brownish colour, with a shade of green; it is inodorous, and has but little of the disagreeable taste of the iron, when properly prepared. It is readily soluble in water, and becomes moist in a damp atmosphere. It gives a dark coloured precipitate with astringent vegetables, but does not afford a blue precipitate by means of the ferrocyanate of potash; neither potash nor soda, nor their subcarbonates, decompose this solution unless heat be applied, and even then ammonia and its carbonate produce no effect upon it. Of all chalybeate preparations it is the least nauseous, and the solution will remain for a considerable time without suffering decomposition; but occasionally it deposits tartrate of lime, this being an incidental impurity in the supertartrate of potash.

Composition.—Ferrum Tartarizatum is a double salt, composed of tartrate of potash and pertartrate of iron. It consists very nearly of

Supertartrate of potash	80
Peroxide of iron	20
	100

Adulteration.—When the digestion has not been continued sufficiently long, the supertartrate of potash is not saturated, and the excess of acid gives a disagreeable taste to the compound. As formerly prepared it frequently contained a large portion of iron filings, which might be separated by a magnet.

Medicinal Uses.—This preparation is advantageously exhibited in all cases in which chalybeates prove useful. From its slight taste it may be readily given when other preparations of iron prove nauseating. The dose is from gr. x. to ʒss. given either in solution, or in the form of bolus, combined with an aromatic; but in its perfect state it cannot be given in the form of powder, on account of its attracting moisture.

VINUM FERRI.

Wine of Iron.

Take of Iron a drachm,
Supertartrate of Potash, powdered, six drachms,
Distilled Water two pints, or as much as may be sufficient,
Proof Spirit twenty fluidounces;

Rub the Iron and the Supertartrate of Potash together, and expose them in an open glass vessel with a fluidounce of Water for six weeks to the air, stirring daily with a spatula, distilled Water being frequently added that they may be always moist. Afterwards dry with a gentle heat, rub to powder, and mix it with thirty fluidounces of distilled Water. Strain the liquor, and when strained, add the Spirit.

Process.—This preparation is tartrate of potash and iron, with excess of supertartrate of potash, which is probably intended to supply the place of the acid contained in the wine formerly employed, and to effect the perfect solution of tartarized iron in the weak spirit.

The quantity of iron directed to be used is very nearly such, that if it were all acted upon by the supertartrate of potash, and dissolved by the spirit, the strength of the present preparation would almost exactly equal that which I found the former to possess. But three causes prevent this: first, the whole of the iron is not acted upon by the supertartrate; secondly, a part of that actually converted into tartarized iron, is rendered insoluble by drying; and thirdly, a portion dissolved by the water is immediately precipitated by the spirit. I find that owing to these circumstances, a pint of the present Vinum Ferri contains only 16 grains of peroxide of iron, instead of 22 grains held in solution, in an equal quantity of the former preparation.

Incompatibles.—The same as with Tinctura Ferri Muriatis.

Medicinal Uses.—Similar to those of the other preparations of iron; but to give as much iron as is contained in ʒj. of tinctura ferri muriatis, would require more than a quarter of a pint of this solution.

PREPARATIONS OF MERCURY.

HYDRARGYRUM PURIFICATUM.

Purified Mercury.

Pour Mercury into an iron retort, and, fire being applied, let the Purified Mercury distil.

Process.—Mercury is a volatile metal, which rises in vapour when heated, and condenses readily. The intention of distilling it, is to remove any metals with which it may be amalgamated; these, not being volatile, will remain in the retort.

HYDRARGYRUM CUM CRETA.

Mercury with Chalk.

Take of Purified Mercury, *by weight*, three ounces;
Prepared Chalk five ounces;
Rub them together until globules are no longer visible.

Process.—I have only slightly examined this preparation, and I am uncertain whether it consists merely of chalk and mercury, in a state of minute division, or whether it is a suboxide of mercury formed by absorbing oxygen during the trituration of the mercury; I have been informed, on respect-

able authority, that the addition of a small quantity of water greatly accelerates the operation.

The mercury is totally insoluble in acetic acid, and therefore is not the black or protoxide; but when the chalk has been separated by acetic acid, the mercury does not form one fluid mass, but exists in the state of separate and minute globules; which I believe, however, to be entirely metallic mercury.

Eight grains of this preparation contain three grains of mercury.

Incompatibles.—Acids and acidulous salts act upon this preparation, and dissolve the chalk with the effervescence of carbonic acid gas.

Medicinal Uses.—It is one of the mildest of all mercurial preparations. Dose, as an alterative, gr. x. to gr. xxx.

HYDRARGYRI OXYDUM RUBRUM.

Red Oxide of Mercury.

Take of Purified Mercury, *by weight*, a pound;

Put the Mercury into a tall glass vessel, which has a narrow mouth and broad bottom. Apply a heat of 600° to this vessel, open, until the Mercury is converted into red scales; afterwards rub them to very fine powder.

Process.—During the action of the heat, the mercury combines with the oxygen of the air, and is by this union converted into red oxide of mercury, termed (chemically) peroxide, as being that which contains most oxygen.

Qualities.—This preparation consists of minute crystalline scales of a deep red colour; it is inodorous, acrid to the taste, and very slightly soluble in water. By a moderate heat the colour becomes much darker, but it is restored on cooling. At a red heat it is decomposed, the mercury returns to the metallic state, and oxygen gas is evolved: when placed upon a red hot iron it is totally volatilized. The muriatic, nitric, and some other acids, dissolve it readily; potash and soda decompose the solutions, and precipitate

orange coloured peroxide of mercury. Ammonia forms a white precipitate, which is composed of the acid, the peroxide, and ammonia.

Composition.—Peroxide of mercury is composed of

Mercury....	92.6	or 1 atom of metal	=200
Oxygen	7.4	2 atoms of oxygen	= 16
	100.0	Weight of the atom	=216

Adulteration.—This preparation is directed by the College to be reduced to powder; but as in this form it would be very easy to adulterate it with the Hydrargyrum Nitrico-oxydum, it is always kept in the state of the small scales which it assumes during its formation. If perfectly pure, it is totally volatilized by a red heat.

Incompatibles.—Acids and acidulous salts, and sulphuretted hydrogen.

Medicinal Uses.—It is a very active medicine; but as it frequently occasions vomiting, purging, and affects the stomach and bowels violently, it is now but little employed. Dose, gr. j. combined with gr. ss. of opium.

HYDRARGYRI NITRICO-OXYDUM.

Nitric-Oxide of Mercury.

Take of Purified Mercury, *by weight*, three pounds,
Nitric Acid, *by weight*, a pound and a half,
Distilled Water two pints;

Mix in a glass vessel, and boil until the Mercury is dissolved, and, the Water being evaporated, a white substance remains. Rub this to powder, and put it into another very shallow vessel; then apply a slow fire, and increase it gradually, until red vapour ceases to appear.

Process.—The mercury decomposes a part of the nitric acid, and, combining with a portion of its oxygen, is converted first into oxide and then into nitrate of mercury; this

nitrate of mercury when exposed to a strong heat is decomposed, and so also is the acid which it contains. The red vapour above-mentioned results from the union of the nitric oxide evolved, with the oxygen of the atmosphere, and the consequent formation of nitrous acid gas. (See Argenti Nitras.)

Qualities.—This preparation is of a bright red colour, much lighter than that of the peroxide of mercury obtained by heat; but its chemical properties are precisely similar.

Composition.—Like the last, this preparation, is peroxide of mercury: it sometimes contains a little undecomposed nitrate, and has on this account been called, but improperly, Subnitrate of Mercury. Excepting a small and accidental portion of undecomposed nitrate, it consists of

Mercury....	92.6	or 1 atom of metal	=200
Oxygen	7.4	2 atoms of oxygen	= 16
	100.0	Weight of its atom	=216

Incompatibles.—Vide Hydrargyri Oxydum Rubrum.

Adulteration.—It would be difficult to sophisticate this preparation considerably, because the admixture may be detected by mere inspection. It should be perfectly volatilized by being placed upon a red hot iron.

Officinal Preparation.—Unguentum Hydrargyri Nitricc-oxydum.

Medicinal Uses.—It is employed only externally as an escharotic.

HYDRARGYRI OXYMURIAS.

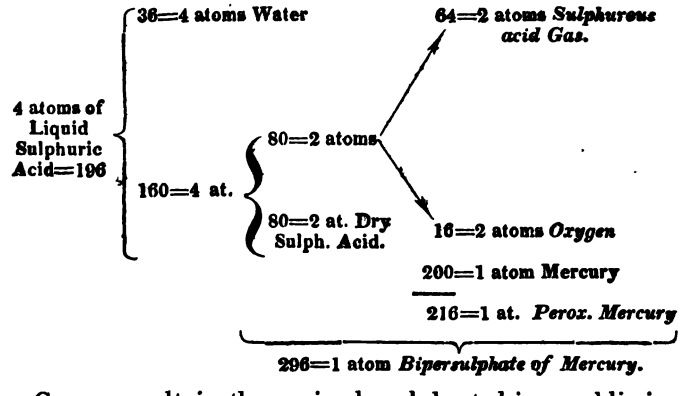
Oxymuriate of Mercury.

Take of Purified Mercury, *by weight*, two pounds,
Sulphuric Acid, *by weight*, thirty ounces,
Muriate of Soda, dried, four pounds;

Boil the Mercury with the Sulphuric Acid in a glass vessel, until the Sulphate of Mercury becomes dried; rub

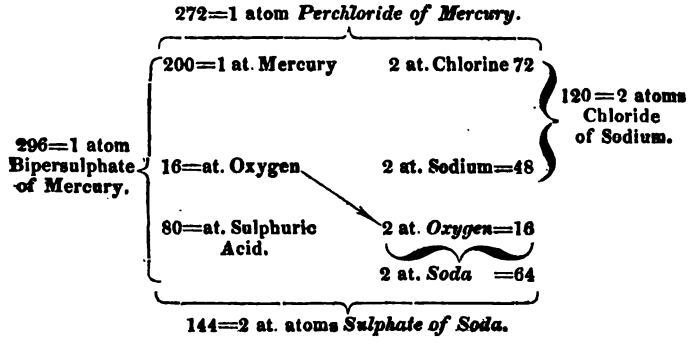
this, when it has cooled, with the Muriate of Soda, in an earthen mortar; then sublime in a glass cucurbit, the heat being gradually increased.

Process.—Supposing the sulphuric acid to be of the greatest density, and that the excess of it, ordered by the College, is merely evaporated, the changes which occur during the formation of Hydrargyri oxymurias, commonly called corrosive sublimate, and correctly bi or perchloride of mercury, are as follows:—4 atoms of liquid sulphuric acid=196, consist of 36=4 atoms of water, and 160=4 atoms of dry sulphuric acid; during ebullition the 36 of water are evaporated; and 80=2 atoms of dry sulphuric acid are decomposed into 64=2 atoms of sulphurous acid gas, which are evolved, and 16=2 atoms of oxygen, which combine with 200=1 atom of mercury and form 216=1 atom of peroxide of mercury, which uniting with 80=2 atoms of sulphuric acid, remaining undecomposed, there are formed 296=1 atom of bipersulphate of mercury.

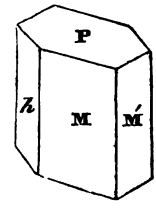


Common salt is then mixed and heated in a subliming vessel with these 296=1 atom of bipersulphate of mercury, consisting, as already stated, of 1 atom mercury=200 and 2 atoms oxygen=16 and 2 atoms sulphuric acid=80; the 120=2 atoms chloride of sodium, (common salt) are composed of 2 atoms chlorine=72 and 2 atoms sodium=48; during the action of these substances upon each other, 200=1 atom mercury, combine with 2 atoms chlorine=72, and form 272=1 atom perchloride of mercury (hydrargyri oxymurias); 16=2 atoms oxygen separated from the mercury, are transferred to the

2 atoms sodium=48 and form 2 atoms soda=64, which combining with 80=2 atoms sulphuric acid, give 144=2 atoms of sulphate of soda, remaining in the lower part of the subliming vessel.



Qualities.—The perchloride of mercury being volatile at the temperature at which it is formed, rises in vapour, and condenses into a white semi-transparent crystalline mass, and perfect crystals are occasionally procurable. The cleavages in the crystals of this substance are parallel to the lateral and to the terminal planes of *a right rhombic prism* of 93° 44′, which therefore may be regarded as the primary form.



P on M, or M′	90°	00′
M on M′.....	93	44
M on *h* 133		8

Corrosive sublimate is inodorous; it has an acrid and nauseous taste, which remains long in the mouth. It is a violent poison. Its specific gravity is 5.200; water, at 60° Fahr. dissolves rather more than 1-20th, and boiling water one-third of its weight. Although light has no action upon this salt in its solid state, yet it partially decomposes the aqueous solution, and calomel or protochloride of mercury is precipitated. It is much more soluble in alcohol, ether, muriatic acid, and solution of muriate of ammonia, than in water. When corrosive sublimate or perchloride of mercury is dissolved in water, it is most probably converted into bipermuriate of mercury, by decomposing a portion of the water, the oxygen of which uniting with the mercury converts it into peroxide, and the hydrogen combining with the chlorine

forms muriatic acid, and they unite into bipermuriate of mercury, which exists, as such, only in solution.

From the solution of bipermuriate of mercury thus formed, the alkalies potash and soda, and lime water, throw down a yellowish red precipitate of peroxide of mercury. Ammonia, however, gives a white one, which is a double compound of muriate of ammonia and peroxide of mercury. (Vide Hydrargyrum Præcipitatum Album.)

Composition.—Perchloride of mercury, or corrosive sublimate, is composed of

Chlorine....26.48	or 2 atoms of chlorine	..36×2= 72
Mercury....73.52	1 atom of metal	.....=200
100.00	Weight of its atom	=272

The term oxymuriate employed by the College to designate this compound, has been used with two and very different meanings; first and generally, to express a compound containing what was formerly called oxymuriatic acid, but now chloric acid; secondly, it has been applied, but to a very limited extent, to denote salts consisting of muriatic acid, united with metals at a maximum of oxidizement; corrosive sublimate was never suspected to contain chloric acid, and until it is dissolved in water, and occasions the decomposition of a portion of that fluid, it is not an oxymuriate in the more restricted meaning of that term.

Adulteration.—I am not aware that this compound is subject to be adulterated. If pure it is totally volatilized by heat, and consequently any substance remaining after exposure to it, must be owing to the admixture of some foreign matter. Calomel, which it may accidentally contain, will be discovered by its insolubility.

Incompatibles.—Ammonia, potash, soda, and their carbonates; lime water, tartarized antimony, nitrate of silver, the acetates of lead, sulphuret of potash, and all hydrosulphurets; soap, many metals, infusion of bitter and astringent vegetables, and some vegetable bodies which possess neither of these qualities.

Officinal Preparations.—Liquor Hydrargyri Oxymuriatis, Hydrargyri Submurias, Hydrargyrum Præcipitatum Album.

Medicinal Uses.—It is frequently serviceable in secondary syphilis, and in some cutaneous diseases, particularly combined with an antimonial, in lepra. Dose, from one-eighth to one-fourth of a grain, made into a pill with crumb of bread.

LIQUOR HYDRARGYRI OXYMURIATIS.

Solution of Oxymuriate of Mercury.

Take of Oxymuriate of Mercury eight grains,
Distilled Water fifteen fluidounces,
Rectified Spirit a fluidounce;
Dissolve the Oxymuriate of Mercury in the distilled Water, and add the Spirit to it.

Qualities.—This solution of bipermuriate of mercury should be kept from the light, as it suffers decomposition by its action. A fluidounce contains half a grain of corrosive sublimate. Dose, half a fluidrachm to two fluidrachms in infusion of linseed.

HYDRARGYRI SUBMURIAS.

Submuriate of Mercury.

Take of Purified Mercury, *by weight*, four pounds,
Sulphuric Acid, *by weight*, thirty ounces,
Muriate of Soda a pound and a half,
Muriate of Ammonia eight ounces;
Boil two pounds of the Mercury with the Sulphuric Acid in a glass vessel, until the Sulphate of Mercury becomes dried; when it has cooled, rub this with two pounds of Mercury in an earthen mortar, that they may be well mixed. Afterwards add the Muriate of Soda, and rub them together until globules are no longer visible; then sublime. Rub the sublimate to very fine powder, pass it through a sieve, and mix it carefully with the Muriate of Ammonia previously dissolved in a gallon of boiling distilled Water. Set it by, that the powder may subside. Pour off the liquor, and wash the powder frequently with boiling distilled Water, until Solution of

Ammonia dropped in, nothing is thrown down. Lastly, let it be made a very fine powder, in the same manner in which we have directed Chalk to be prepared.

Process.—It has been already mentioned, that when mercury and sulphuric acid are boiled together, the metal is converted into bipersulphate, which when rubbed as directed with a quantity of mercury equal to that which it already contains, we may consider as forming with it protosulphate of mercury, or sulphate of the protoxide; for the first portion of mercury yields half its oxygen to the second portion, and both become protoxide, and combine with the sulphuric acid.

296=1 atom Bipersulphate of Mercury { 200=1 atom Mercury, 200=1 atom Mercury; 16=2 atoms Oxygen; 80=2 atoms Sulphuric Acid }

496=2 atoms *Protosulphate of Mercury.*

Now when this protosulphate is mixed and heated with common salt, the changes which occur are, that 496, the 2 atoms of protosulphate of mercury, composed of 400=2 atoms mercury, 16=2 atoms oxygen and 80=2 atoms sulphuric acid, decompose 120=2 atoms chloride of sodium, consisting of 72=2 atoms chlorine and 48=2 atoms sodium; the 2 atoms of mercury=400 combine with the 2 atoms of chlorine=72, and form 472=2 atoms of protochloride of mercury, calomel or hydrargyri submurias; 16 the 2 atoms of oxygen combine with 48 the 2 atoms of sodium and form 64=2 atoms of soda, which uniting with 80 the 2 atoms of sulphuric acid, there result 144=2 atoms of sulphate of soda.

472=2 atoms *Protochloride of Mercury.*

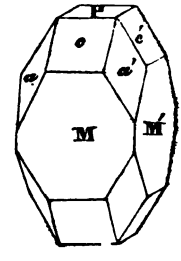
496=2 atoms Protosulphate of Mercury { 400=2 at. Mercury; 2 at. Chlorine=72; 16=2 at. Oxygen; 2 at. Sodium=48; 80=2 at. Sulphuric Acid; 2 at. *Oxygen*=16; 2 at. *Soda* =64 } 120=2 atoms Chloride of Sodium.

144=2 atoms *Sulphate of Soda.*

The solution of muriate of ammonia, in which the calomel is directed to be put previously to subjecting it to the process of elutriation, is intended to dissolve readily any corrosive sublimate which the calomel may contain; there is no doubt of its producing this effect more quickly than mere water, but it has been found by Mr. Hennell, of Apothecaries' Hall, that calomel is also actually converted into corrosive sublimate by the action of the ammoniacal salt.

In preparing corrosive sublimate, it will be observed, that two pounds of mercury are used with thirty ounces of sulphuric acid and four pounds of common salt, whereas in preparing calomel the proportions are four pounds of mercury to thirty ounces of the acid, and a pound and a half of salt. It is evident, therefore, that supposing the quantities last directed to be proper, the proportion of acid employed in the former preparation is too great by one half, and the common salt is still more in excess: it appears to me that the smaller quantities are quite sufficient.

Qualities.—Submuriate of mercury is commonly called calomel, and by chemists is termed chloride or protochloride of mercury. It is a white semitransparent crystalline mass, inodorous, insipid, and insoluble in water. Its specific gravity is 7.175; by long exposure to light it is rendered of a dark colour, owing to partial decomposition. Occasionally perfect crystals are obtained, in which although there does not appear to be any distinct cleavage, there are indications of it parallel to all the planes of a *square prism*, and this may be regarded as the primary form.



P on M, or M'	90°	00'
P on *a*	112	5
P on *c*	119	50
M on M'	90	00
M on *c*	150	10

Composition.—Calomel is composed of

Chlorine....15.25	or 1 atom of chlorine	=	36
Mercury....84.75	1 atom of mercury	=200	
100.00	Weight of its atom	=236	

Impurities.—This preparation has been sometimes suspected to contain corrosive sublimate, a circumstance which I do

not think likely to have occurred after it has been reduced to powder, either by elutriation or levigation. To detect corrosive sublimate, let the calomel be boiled in distilled water, filter it, and add liquor potassæ: if any corrosive sublimate be present, an orange coloured precipitate of peroxide of mercury will be obtained, liquor ammoniæ will give a white one, which is a double compound of muriate of ammonia and peroxide of mercury.

Some years since, Mr. Jewell, of the house of Howard, Jewell and Gibson, of Stratford, invented a process for procuring calomel, by one operation, in a state of such minute division as to render any further operation unnecessary. His plan consists in passing the vapour of the calomel, as it rises, into water, by which it is immediately condensed, and into a much finer powder than that obtained by levigation or elutriation. A given weight of calomel thus prepared, occupies much less space than an equal quantity reduced to powder by the usual processes; and Dr. Paris observes, that in consequence probably of this minute division, it appears to affect the system more readily than that made according to the Pharmacopœias; it may also be remarked, that this method of preparation must completely remove all suspicion of the presence of corrosive sublimate in the product.

Incompatibles.—Calomel is immediately decomposed by lime-water, muriate of lime being formed and dissolved, while black or protoxide of mercury is precipitated. The solutions of ammonia, of potash, and of soda, and their subcarbonates, produce a similar effect, and their respective muriates are formed. The carbonates or rather bicarbonates of potash and soda do not decompose calomel. Nitric acid converts it into corrosive sublimate. It is decomposed also by iron, lead and copper, and it is incompatible with hydrosulphurets.

Officinal Preparations.—Hydragyri Oxydum Cinereum. Pilulæ Hydrargyri Submuriatis Compositæ.

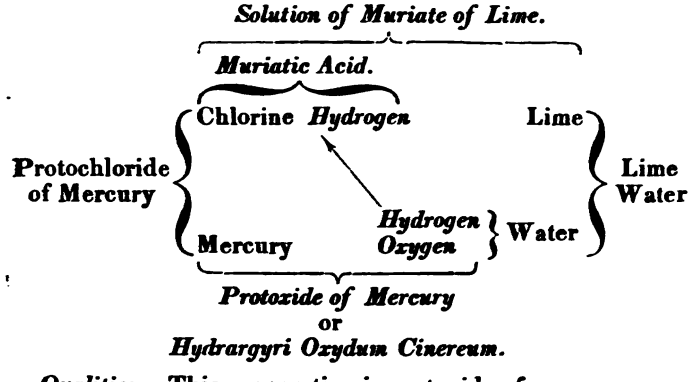
Medicinal Uses.—It is an extremely efficient purgative, and it is alterative, antisyphilitic, and a valuable remedy in obstructions and hepatic affections. It is particularly useful in the diseases of children, and they frequently bear larger doses of it than adults. Dose as an alterative gr. ss. to gr. j. night and morning; as a purgative from gr. ij. to gr. x. or in some cases considerably more. Its insolubility and great specific gravity prevent its being eligibly exhibited in any other form than that of powder or of pill.

HYDRARGYRI OXYDUM CINEREUM.

Grey Oxide of Mercury.

Take of Submuriate of Mercury an ounce,
Lime Water a gallon;
Boil the Submuriate of Mercury in the Lime Water, constantly stirring, until the grey Oxide of Mercury subsides. Wash this with distilled Water; afterwards dry it.

Process.—It has been already remarked that calomel is decomposed by lime water, and that muriate of lime and protoxide of mercury are the results of this decomposition. Calomel, or protochloride of mercury, consists of chlorine and mercury, and when acted upon by the lime water, a portion of the water is decomposed, and its oxygen combining with the mercury renders it protoxide, while its hydrogen uniting with the chlorine, forms muriatic acid, with which the lime uniting, muriate of lime results and remains in solution, while the protoxide of mercury, or Hydrargyri Oxydum Cinereum, is precipitated.



Qualities.—This preparation is protoxide of mercury, consisting of

Mercury....	96.16	or 1 atom of metal	=200
Oxygen	3.84	1 atom of oxygen.....	= 8
	100.00	Weight of its atom	=208

As usually prepared it is a mixture of different proportions of calomel and protoxide, or calomel and peroxide, and sometimes of calomel and both oxides of mercury; and its colour is as various as its composition. It appears to suffer change by the action of the light, by exposure to which, black oxide of mercury acquires an olive tint, owing to the formation of some peroxide of mercury; this may be derived either from the addition of oxygen to the protoxide, or the reduction of a portion of it to the metallic state, and the transfer of its oxygen to some of the protoxide.

Adulteration.—If pure it dissolves entirely in acetic acid, and is totally insoluble in muriatic, but if it contains peroxide, the latter acid will dissolve it, and the protoxide will be converted into calomel; if the solution gives a white precipitate on the addition of Liquor Ammoniæ, or a yellow one with Liquor Potassæ, then the preparation contains peroxide of mercury. If it contains undecomposed calomel, then by boiling with a solution of pure potash, muriate of potash will be obtained, which, when the solution is saturated with nitric acid, will afford a white precipitate of chloride of silver, on the addition of the nitrate of silver. It is rarely used. Dose, from gr. j. to gr. iij. in the form of a pill, twice a day; as, however, its strength must greatly vary, it is better to employ more certain preparations.

HYDRARGYRUM PRÆCIPITATUM ALBUM.

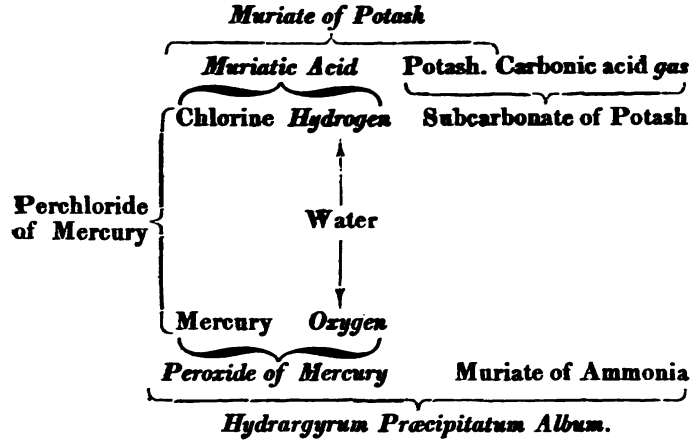
White Precipitated Mercury.

Take of Oxymuriate of Mercury half a pound,
Muriate of Ammonia four ounces,
Solution of Subcarbonate of Potash half a pint,
Distilled Water four pints;

First dissolve the Muriate of Ammonia, afterwards the Oxymuriate of Mercury, in the distilled Water, and add to these the Solution of Subcarbonate of Potash. Wash the precipitated powder until free from taste; then dry it.

Process.—In this operation the oxymuriate or perchloride of mercury is converted, by solution in and the decompo-

sition of water, into bipermuriate of mercury; the chlorine of the perchloride uniting with the hydrogen of the water to form muriatic acid, while the oxygen of the water combines with the mercury and converts it into peroxide; the permuriate or rather bipermuriate of mercury thus formed is decomposed by the subcarbonate of potash, the muriatic acid uniting with the potash gives rise to muriate of potash which remains in solution, while the carbonic acid is evolved in the state of gas. The peroxide of mercury separated from the muriatic acid by the potash, then combines with the muriate of ammonia, and forms the compound called hydrargyrum præcipitatum album.



Composition.—According to Mr. Hennell this substance consists of

Muriate of Ammonia....	20 or 1 atom	.....	= 54
Peroxide of Mercury ..	80 1 atom	.....	=216
		Weight of its atom	=270

Qualities.—This is a light and perfectly white powder. It is inodorous, insipid, and insoluble in water. If heated with potash it is decomposed, and its ammonia is expelled, owing to the combination of the muriatic acid with the potash: if too much potash be used in its preparation, the same effect will be produced. It is decomposed also by the sulphuric and nitric acids.

Adulteration.—If this preparation should be mixed with white lead or chalk, they will remain after it has been exposed

to a strong red heat in a crucible: to determine which of the two substances it has been adulterated with, dissolve the residuum in nitric acid and add Liquor Ammoniæ to the solution. If it be lead, a white precipitate will be immediately formed, which sulphuretted hydrogen will blacken; and if it be lime, no precipitate will occur, until carbonate of ammonia has also been mixed with it.

Officinal Preparations.—Unguentum Hydrargyri Præcipitati Albi.

Medicinal Uses.—It is employed only externally, in cutaneous affections.

HYDRARGYRI SULPHURETUM NIGRUM.

Black Sulphuret of Mercury.

Take of Purified Mercury, *by weight*, a pound,
Sublimed Sulphur a pound;
Rub them together until globules are no longer visible.

Process.—The mercury combines with a portion of the sulphur by mere trituration; according to Mr. Brande, (Manual of Pharmacy, p. 303) when Hydrargyri Sulphuretum Nigrum is boiled in a solution of potash, the excess of sulphur is removed, and a black insoluble powder remains, which when washed and dried is not acted upon by nitric acid, sublimes at a red heat without decomposition, and assumes the characters of the Hydrargyri Sulphuretum Rubrum.

Qualities.—This preparation, well known by the name of Æthiop's mineral, is a very black insipid and inodorous powder.

Composition.—It follows from what has been stated, that Hydrargyri Sulphuretum Nigrum is a mixture of

Red Sulphuret of Mercury	58
Sulphur	42
	100

Adulteration.—It is stated to be sometimes mixed with ivory black; if this be the case, heat it in an earthen cruci-

ble, and the sulphuret of mercury will be volatilized, and after a red heat has been for some time applied, a white powder will remain, which is the phosphate of lime of the ivory black, deprived of its charcoal. If it be adulterated with sulphuret of antimony, boil a little of the powder in undiluted muriatic acid, pour the clear solution into water, and submuriate of antimony will be precipitated.

Medicinal Uses.—It is an inefficient preparation. Dose, from gr. v. to gr. xxx. as an alterative.

HYDRARGYRI SULPHURETUM RUBRUM.

Red Sulphuret of Mercury.

Take of Purified Mercury, *by weight*, forty ounces,
Sublimed Sulphur eight ounces;

Mix the Mercury with the melted Sulphur over the fire, and, as soon as the mass swells, remove the vessel from the fire, and cover it strongly lest inflammation should occur; then rub to powder and sublime.

Process.—By the action of heat in the first instance, combination takes place between the mercury and a portion of the sulphur; by continuing it, the excess of the latter appears to be expelled, and by sublimation, the red, per or bisulphuret of mercury is obtained.

Qualities.—When in mass, this substance is of a dark colour, which, when reduced to a fine powder, is of a brilliant red, and it is often called cinnabar or vermilion. It is inodorous and insipid; unalterable by exposure to the air or moisture. When heated to redness in an open vessel, the sulphur is converted into sulphurous acid, and the mercury escapes in vapour. It is decomposed when distilled with lime, potash, or soda, and also by several of the metals.

When it is heated with sulphuric acid, sulphurous acid is evolved and sulphate of mercury is formed. It is insoluble in nitric or muriatic acid, but when mixed, the chlorine evolved, acts upon and dissolves it, without the assistance of heat.

Composition.—It consists of

Mercury....86.2	or 1 atom of metal	=200
Sulphur 13.8	2 atoms of sulphur ..16×2	= 32
100.0	Weight of its atom	=232

Adulteration.—If the presence of red oxide of lead be suspected, heat the sulphuret in an earthen crucible; the sulphuret of mercury will be volatilized, and any residuum must be owing to impurity: add dilute nitric acid to it, and then mix separate portions of the clear solution with dilute sulphuric acid and solution of sulphuretted hydrogen. If the former occasion a white precipitate, and the latter a black one, red lead must have been mixed with the sulphuret.

Medicinal Uses.—It is employed for the purpose of mercurial fumigation, by heating ʒss. of it on red hot iron.

PREPARATIONS OF LEAD.

PLUMBI ACETAS.

Acetate of Lead.

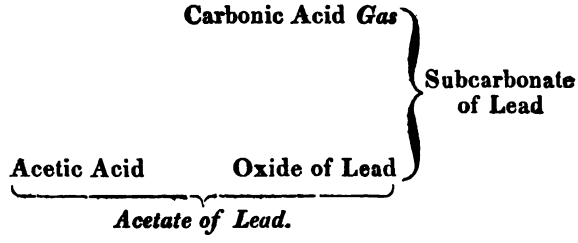
Take of Subcarbonate of Lead a pound,
Stronger Acetic Acid a pint,
Boiling Distilled Water a pint and a half;

Mix the Acid with the Water: to these gradually add the Subcarbonate of Lead, and boil until the Acid is saturated; then strain through paper, and, the Water being evaporated until a pellicle is produced, set aside, that crystals may be formed; the liquor being poured off, dry these upon bibulous paper.

Process.—Subcarbonate of lead, usually called white lead, and correctly carbonate, is composed of

Carbonic acid....16.4	or	1 atom of acid	= 22
Oxide of lead....83.6		1 atom of oxide	=112
100.0		Weight of its atom	=134

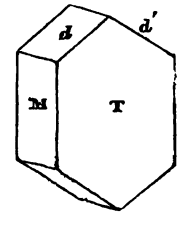
When acetic acid is added to it, the carbonic acid is expelled in the state of gas, on account of the greater affinity of the acetic acid for the oxide of lead; a solution of acetate of lead is formed.



It will appear by calculation that the carbonate of lead here directed to be employed is not sufficient to saturate the acetic acid; but the deficiency is not great.

This salt, as prepared for the purposes of the arts, is extremely pure, and much cheaper than it can be made by the chemist; it might, therefore, have been introduced into the Materia Medica, as well as sulphate of soda and some other preparations.

Qualities.—Acetate of lead is crystalline, colourless, nearly inodorous, of a sweetish astringent taste, and is poisonous; it suffers but little change by exposure to the air. The crystals are usually very small; but if they are suffered to form slowly, they may be obtained of considerable size. Their primary form appears to be *a right oblique-angled prism;* the only modification which it has been as yet observed to present, is exhibited in the annexed figure:—



d on d'	128°	0'
d on M	116	0
d on T	98	30
M on T	109	32

Water at 60° dissolves about one-fourth of its weight of this salt, and it is not much more soluble in boiling water. When the solution is exposed to the air the acetate is partly decomposed by the absorption of carbonic acid, and carbonate of lead is precipitated: water which contains carbonic acid also decomposes acetate of lead to a certain extent; and if a current of carbonic acid gas be passed through the solution, one half of the acetate is converted into carbonate and precipitated, and binacetate of lead remains in solution.

Composition.—Acetate of lead is composed of

Acetic acid....26.8	or	1 atom of acid	= 51
Oxide of lead..58.9		1 atom of oxide	=112
Water.....14.30		3 atoms of water 9×3	= 27
100.00		Weight of its atom	=190

Adulteration.—This salt ought to dissolve entirely in distilled water free from carbonic acid; any thing that remains insoluble is to be regarded as impurity.

Incompatibles.—It is decomposed by all those acids and their compounds which form, with oxide of lead, salts nearly insoluble in water, as the sulphuric, muriatic, carbonic, citric, and tartaric. It is decomposed by lime water, by the alkalies ammonia, potash, and soda; the two latter, if added in excess, re-dissolve the precipitate at first formed. Hard water usually contains three ingredients which decompose it, viz. carbonate of lime, sulphate of lime, and muriate of soda; and hence, when dissolved in such water, the solution is always turbid. It is decomposed by solution of sulphuretted hydrogen, which gives a black sulphuret: Liquor Ammoniæ Acetatis also decomposes it, on account of the carbonic acid diffused through it.

Officinal Preparations.—Ceratum Plumbi Acetatis.

Medicinal Uses.—It is principally employed, externally, in solution in water, as a collyrium in opthalmia, an astringent in gonorrhœa, and as a wash in external inflammation. Internally it is given cautiously, and combined with opium, in protracted diarrhœa, and in pulmonary and intestinal hæmorrhage. Dose, gr. ss. to gr. j.

LIQUOR PLUMBI SUBACETATIS.

Solution of Subacetate of Lead.

Take of Semi-vitreous Oxide of Lead two pounds,
Diluted Acetic Acid a gallon;
Mix, and boil down to six pints, constantly stirring; afterwards set by, that the dregs may subside, and strain.

Process.—What is here termed semi-vitreous oxide of lead, is usually called litharge; it is the protoxide of lead, composed of

Lead.....92.8	or	1 atom of metal	=104
Oxygen .. 7.2		1 atom of oxygen	= 8
100.0		Weight of its atom	=112

Qualities.—This solution is either colourless or has a slight greenish yellow tint; it has an astringent sweetish taste. Its specific gravity depends upon the strength of the distilled vinegar employed; when the sp. gr. of the latter is 1.007 that of the solution of subacetate of lead is 1.220. It is decomposed by spring water for the same reasons as the acetate of lead, and the quantity of insoluble salt of lead thrown down is much larger; distilled water which contains even the smallest portion of carbonic acid likewise decomposes it.

Composition.—According to Dr. Bostock's analysis this salt is a dinacetate, and consists of

Acetic acid....18.5	or	1 atom of acid	= 51
Oxide of lead..81.5		2 atoms of oxide	112×2=224
100.0		Weight of its atom	=275

It is evident from what I have stated respecting the variable specific gravity of the solution, that it must consist of this subsalt, dissolved in different quantities of water; its strength is therefore uncertain.

Adulteration.—This preparation is frequently made with the residuum of the distillation of vinegar; it has then a dark colour, and ought to be rejected.

Incompatibles.—Similar to those which are such with the acetate of lead.

Officinal Preparation.—Liquor Plumbi Subacetatis dilutus.

Medicinal Uses.—External in superficial and phlegmonic inflammations of the skin.

LIQUOR PLUMBI SUBACETATIS DILUTUS.

Diluted Solution of Subacetate of Lead.

Take of Solution of Subacetate of Lead a fluidrachm,
Distilled Water a pint,
Proof Spirit a fluidrachm;
Mix.

It is justly observed by Dr. Paris, that the quantity of spirit here directed to be used, is much too small to answer the intention of increasing the refrigerating effect of the acetate of lead: the quantity of rectified spirit amounts to scarcely 1-220th part of the whole fluid.

Medicinal Uses.—It is employed as an application in superficial inflammation.

PREPARATIONS OF ZINC.

CALAMINA PRÆPARATA.

Prepared Calamine.

Burn the Calamine; then bruise it. Then let it be made a very fine powder in the same manner in which we have directed Chalk to be prepared.

Calamine is a carbonate of zinc which occurs plentifully in some parts of England; it is usually, however, impure,

being mixed with earthy matter. It is sometimes externally applied in excoriations.

ZINCI SULPHAS.

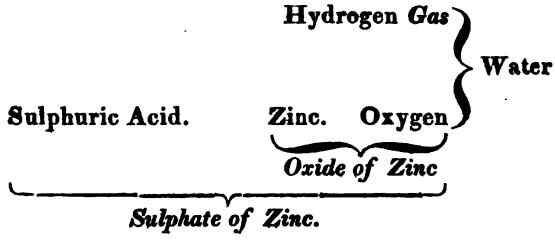
Sulphate of Zinc.

Take of Zinc, in small pieces, four ounces,
Sulphuric Acid, *by weight*, six ounces,
Distilled Water four pints;

Mix in a glass vessel, and, the effervescence being finished, strain the liquor through paper; then boil down until a pellicle is produced, and set aside, that crystals may be formed.

Process.—The phenomena and effects which are produced during the solution of zinc in sulphuric acid are precisely analogous to those which occur during the solution of iron in the same acid.

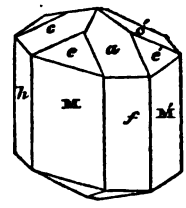
Concentrated sulphuric acid does not act upon zinc at common temperatures, but when water is added, it is decomposed; the oxygen combines with the zinc to form oxide, which is dissolved by the acid, and the hydrogen is evolved in the state of gas.



Qualities.—The solution of sulphate of zinc is colourless, and by evaporation it readily yields crystals, which are also devoid of colour; the primary form of this salt is *a right rhombic prism.*

It may be cleaved parallel to the plane *h* of the annexed figure; no distinct cleavages have been observed in any other direction.

M on M'	91°	7'
M on *f*	135	33
M on *h*	134	27
M on *e*	128	58
a on *f*	120	0
h on *c*	119	23



The crystals of this salt are colourless, usually very small, and not readily by appearance distinguishable from those of sulphate of magnesia: sulphate of zinc has a disagreeable metallic taste; it is not altered by exposure to the air, but if moderately heated loses its water of crystallization, and when it is subjected to a high temperature is entirely decomposed, the acid being expelled, and the oxide only remaining; it is soluble in two and a half times its weight of water at 60°, and much more so in boiling water. The alkalies, ammonia, potash and soda, decompose the solution, and precipitate oxide of zinc, which is perfectly white; but if they are used in excess, then the oxide is re-dissolved; the alkaline carbonates throw down white carbonate of zinc; water impregnated with sulphuretted hydrogen decomposes the solution, and forms a yellow precipitate, which is probably a hydrosulphuret.

Composition.—Sulphate of zinc is composed of

Sulphuric acid..27.6	or 1 atom of acid.....	= 40
Oxide of zinc ..28.9	1 atom of oxide	= 42
Water 43.5	7 atoms of water.....	= 63
100.0	Weight of its atom	=145

Adulteration.—The white vitriol of commerce, which is an impure sulphate of zinc in irregular masses, is sometimes substituted for the pure crystalline salt; when its use is unavoidable, it should be remembered that it contains but little water, and is consequently more powerful than the sulphate in crystals. It frequently also contains the oxides of copper and iron, both of which may be detected by pouring excess of liquor ammoniæ into a solution of the salt. The oxide of zinc will be re-dissolved; and that of copper also, the latter giving the solution a blue colour; the oxide of iron, on the other hand, will be precipitated in the state of oxide.

Incompatibles.—Alkalies and their carbonates, lime water, hydrosulphurets, and astringent vegetable infusions.

Officinal Preparations.—Liquor Aluminis Compositus. Zinci Oxydum.

Medicinal Uses.—Internally as a tonic and astringent. Dose, gr. i. to gr. ij. which may be gradually increased to gr. v. or gr. vi. without exciting nausea. It operates quickly as an emetic, in doses of gr. x. to gr. xxx. Externally it is employed as an astringent, as a substitute for the preparations of lead, in the proportion of gr. x. to eight fluidounces of water.

ZINCI OXYDUM.

Oxide of Zinc.

Take of Sulphate of Zinc a pound,
Solution of Ammonia a pint, or as much as may be sufficient,
Distilled Water a pint;

Dissolve the Sulphate of Zinc in the distilled Water, and add as much of the Solution of Ammonia as may be sufficient, that the Oxide of Zinc may be thrown down entirely. The liquor being poured off, wash the powder frequently with distilled Water, and dry it in a sand bath.

Process.—This is a case of single elective affinity producing single decomposition; the sulphuric acid having greater affinity for the ammonia than for the metallic oxide, sulphate of ammonia is formed, which remains in solution, and oxide of zinc is precipitated; but if excess of ammonia is used then a portion of the oxide at first thrown down is re-dissolved. The quantity of water should be five times greater than ordered for the solution of the sulphate of zinc.

Sulphate of Ammonia.

Sulphate of Zinc { Sulphuric Acid / Ammonia
Oxide of Zinc

Qualities.—Oxide of zinc is a colourless, inodorous, tasteless substance. It is insoluble in water, but dissolved by most acids, and very readily by the solutions of potash, soda and ammonia, but not by those of their carbonates.

Composition.—It consists of

Zinc.....81	or 1 atom of metal	=	34
Oxygen ..19	1 atom of oxygen	=	8
100	Weight of its atom	=	42

Adulteration.—If it contain white lead or chalk, dilute sulphuric acid will not dissolve them, but convert them into insoluble sulphates with effervescence.

Incompatibles.—This oxide is of course incompatible with the alkalies, acids and acidulous salts.

Officinal Preparation.—Unguentum Zinci.

Medicinal Use.—Tonic. Dose, gr. j. to gr. vj. twice a day in the form of pill.

PREPARATIONS OF SULPHUR.

OLEUM SULPHURATUM.

Sulphurated Oil.

Take of Washed Sulphur two ounces,
Olive Oil a pint;

Throw the Sulphur gradually into the Oil heated in a very large iron vessel, and stir constantly with a spatula until they have united.

Qualities.—Sulphur is soluble in oils, and more especially in linseed oil. This preparation is a viscid fluid, of a reddish brown colour. It is extremely fœtid and nauseous, and was formerly called Balsam of Sulphur.

Medicinal Uses.—It was once considered to be balsamic, and exhibited as such in colds and coughs, in doses of ♏ v.

to ℥ xxx. It is now rarely used, and only externally as a detergent.

Sulphur is a well known elementary or undecomposed body, which sometimes occurs in nature nearly pure, but more commonly in combination with the metals, forming sulphurets. The greater part of that which is used in the arts, is the produce of volcanic countries. Its colour is yellow with a shade of green; it is nearly inodorous and tasteless, insoluble in water, and is with difficulty dissolved by spirit of wine. The sp. gr. of sulphur is about 2; at a moderate temperature it melts, and at a higher one is converted into vapour; it burns readily with a lambent blue flame, and suffocating vapours of sulphurous acid are formed, by its combining with the oxygen of the air during combustion. When pure, or crystallized, it is frequently translucent. The primary form of the crystal is *an acute octahedron with a rhombic base,* subject to various modifications.

In commerce, the various kinds of sulphur are distinguished by the names of Crude Sulphur; Flowers of Sulphur (the Sulphur Sublimatum of the Pharmacopœia); and Roll Sulphur, prepared by melting crude sulphur, and pouring it while fluid into moulds.

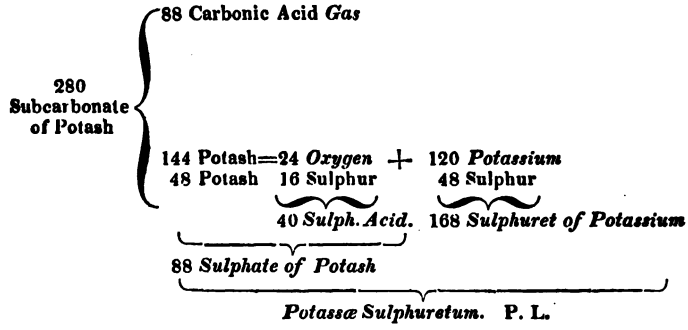
POTASSÆ SULPHURETUM.

Sulphuret of Potash.

Take of Washed Sulphur an ounce,
Subcarbonate of Potash two ounces;
Rub them together, and place them upon the fire in a covered crucible, until they have united.

Process.—When sulphur and subcarbonate of potash are heated together, the carbonic acid is expelled from the latter, and three-fourths of the potash, or oxide of potassium, are decomposed; its oxygen combines with sulphur to form sulphuric acid, and this uniting with the one-fourth of undecomposed potash, sulphate of potash results. The potassium of the decomposed potash combines also with

sulphur, and sulphuret of potassium is formed; so that the Potassæ Sulphuretum of the Pharmacopœia is a compound of sulphate of potash and sulphuret of potassium, when the operation has been properly conducted. The peculiar properties of the compound depend upon the sulphuret of potassium.



Qualities.—This substance is hard, and of a liver-brown colour, and hence its former name of Hepar Sulphuris. It is inodorous while dry, but when moistened it emits a smell of sulphuretted hydrogen. Its taste is acrid and bitter. By exposure to the air this preparation is soon spoiled, for the sulphur and potassium both attracting oxygen, sulphate of potash is formed; it then becomes inodorous and white, and is totally unfit for use. It dissolves readily in water, or at least the sulphuret of potassium does, and decomposes a portion of it, the oxygen of which forms potash with the potassium; and the hydrogen combining with the sulphur, sulphuretted hydrogen results from their union.

Incompatibles.—This compound is decomposed by acids, which combine with the potash, and expel sulphuretted hydrogen gas; it is decomposed also by solutions of most of the metals, which, uniting with the sulphur, are precipitated in the state of sulphuret or of hydrosulphuret.

Medicinal Uses.—It is principally used externally in cutaneous diseases, and has been recommended as a lotion for the itch in infants, and is stated to have succeeded after the sulphur ointment has failed. It is rarely used internally.

SULPHUR LOTUM.

Washed Sulphur.

Take of Sublimed Sulphur a pound;
Pour Boiling Water upon it, so that the Acid, if there be any, may be entirely washed away; afterwards dry it.

Process.—By the operation of washing it is intended to free the sulphur from any acid which may have been formed during sublimation.

SULPHUR PRÆCIPITATUM.

Precipitated Sulphur.

Take of Sublimed Sulphur a pound,
Fresh Lime two pounds,
Water four gallons;
Boil the Sulphur and the Lime together in the Water; then strain the liquor through paper, and drop into it of Muriatic Acid as much as may be sufficient, that the Sulphur may be thrown down. Lastly, water being frequently poured upon this, wash until it becomes tasteless.

Process.—When lime and sulphur are boiled together in water, a portion of the fluid appears to be decomposed, and its oxygen and hydrogen unite with separate portions of the sulphur to form two different compounds, and these again combine with the lime and render it soluble. When muriatic acid is added, it takes the lime, expels sulphuretted hydrogen gas, and precipitates sulphur; the muriate of lime remains in solution.

Qualities.—Sulphur præcipitatum differs from sublimed in containing a small quantity of water, to which its whiteness is owing. The substance formerly called Lac Sulphuris is

a very impure preparation; it is formed by adding sulphuric acid instead of muriatic, to the solution of sulphur and lime; so that the sulphur is precipitated in mixture with a large quantity of sulphate of lime. This is easily detected by heating the precipitated sulphur in a crucible: if it be pure it will be totally volatilized, but any sulphate of lime which it may contain will be left in the state of a white powder.

Medicinal Use.—It is employed as a laxative. Dose, from ʒj. to ʒij.

VEGETABLES.

Vegetables are to be collected from the places and soil where they grow spontaneously, in dry weather, when not wet with showers nor dew; they are to be collected annually, and those which have been kept longer are to be rejected.

Most ROOTS are to be dug up before the stalks or leaves shoot forth.

BARKS ought to be collected at that season, in which they can most easily be separated from the wood.

LEAVES are to be gathered after the flowers are blown, and before the seeds ripen.

FLOWERS are to be gathered recently blown.

SEEDS are to be collected when ripe, and before they have begun to fall from the plant. These should be kept in their own seed vessels.

THE PREPARATION OF VEGETABLES.

Dry vegetables shortly after they have been gathered, those excepted which ought to be fresh, lightly strewed, as quickly as possible, with so gentle a heat that the colour may not be changed; keep them afterwards in places or proper vessels, excluded from the access of light and moisture.

Lay up those ROOTS which we have directed to be kept fresh, in dry sand. Cut the ROOT OF THE SQUILL

before drying, the dry rind being peeled off, transversely into thin slices.

Put PULPY FRUITS, if they are unripe, or if ripe and dry, in a moist place, that they may soften; then press the pulps through a hair sieve; afterwards boil them with a slow fire, frequently stirring; lastly, evaporate the water in a water bath, until the pulps become of a proper thickness.

Pour boiling water upon the bruised PODS OF CASSIA, that the pulp may be washed out, which press first through a coarse sieve, and afterwards through a hair one; then evaporate the water in a water bath, until the pulp has a proper thickness.

Press the pulp or juice of ripe and fresh fruits through a sieve, no boiling being used.

GUM RESINS.

Separate OPIUM from foreign substances, especially the external, as carefully as possible. Let Opium be kept *soft*, which may be fit to be formed into pills, and *hard*, which has been so dried in a water bath, that it may be rubbed to powder.

Those Gum Resins are to be reckoned best, which have been selected so perfect, that no purification is necessary. But if they appear to be less pure, boil them in water until they soften, and squeeze them with a press through a hempen cloth; then set them by, that the resinous part may subside. Evaporate the supernatant liquor poured off, in a water bath, the resinous part being added towards the end, that it may unite with the gummy part.

The GUM RESINS which melt easily, may be purified by putting them into an ox bladder, and keeping them in boiling water, until they become so soft, that they may be separated from impurities by a press through a hempen cloth.

Dissolve the BALSAM OF STORAX in rectified spirit, and strain; then let the spirit distil with a gentle heat, until the balsam becomes of a proper thickness.

EXPRESSED OILS.

These substances, sometimes termed fat or fixed oils, are usually obtained by expression, as the name adopted in the Pharmacopœia denotes. The greater part of them are viscid fluids; but some of them, as palm oil and cocoa-nut oil, are soft solids, at a mean temperature; and those which are usually fluid congeal at about 32°: they have but little odour, and are nearly or quite insipid. The colour varies in different oils: cocoa-nut oil is white, almond oil yellowish, olive oil has a yellowish green tint, linseed oil is of a brown colour, and palm oil is reddish. They are insoluble in water, and, with the exception of castor oil, they are but little soluble in alcohol. They are generally lighter than water. By exposure to the air, they absorb oxygen and become rancid. If they have been expressed with the assistance of heat, they are more subject to rancidity.

When heated to about 600°, or upwards, they are decomposed, and yield carburetted hydrogen gas. These oils combine with oxide of lead, and this combination is the basis of various plaisters. They are triple compounds of different proportions of oxygen, hydrogen, and carbon.

OLEUM AMYGDALARUM.

Oil of Almonds.

Macerate either sweet or bitter Almonds in cold Water for twelve hours, and bruise them; then, no heat being applied, express the Oil.

Medicinal Uses.—In the form of emulsion, in coughs, and other pulmonary complaints. The oil should be nearly colourless, inodorous and insipid. It possesses the same properties whether it is obtained from bitter or sweet almonds.

OLEUM LINI.

Linseed Oil.

Bruise the Linseed; afterwards, no heat being applied, express the Oil.

Medicinal Uses.—Emollient and demulcent. Its taste is nauseous, and therefore seldom used internally. It is sometimes employed in enemas, in flatulent colic, &c.

OLEUM RICINI.

Castor Oil.

The outer coats of Castor Seeds being taken off, bruise them; afterwards, no heat being applied, express the Oil.

Medicinal Use.—Purgative. Dose, from f℥iv. to f℥iss. It should be nearly colourless and inodorous. When heat has been used in expressing the oil, it is frequently rancid and of a dark colour. It differs from most fixed oils in combining readily with spirit of wine.

DISTILLED OILS.

OIL OF ANISE,
CHAMOMILE,
CARRAWAY,
JUNIPER,
LAVENDER,
PEPPERMINT,
SPEARMINT,
MARJORAM,
PIMENTA,
PENNYROYAL,
ROSEMARY.

The Seeds of Anise and Carraway, the Flowers of Chamomile and Lavender, the Berries of Juniper and Pimenta, the Tops of Rosemary, and the fresh Herbs of the rest are to be employed.

Put any one of these into an alembic, and add as much Water as will cover it, then let the Oil distil into a large cold vessel.

The Water which comes over while distilling with the Oils of Carraway, Peppermint, Spearmint, Pimenta and Pennyroyal, should be kept for use.

Distilled Oils are frequently called volatile, essential, or æthereal oils. Their chemical characters are nearly the same from whatever vegetables they are procured; but in their sensible qualities they vary considerably, possessing different colours, consistence, smell, and taste; the two latter properties are, of course, derived from that of the plant from which they are obtained; their colours, like those of the fluid fixed oils, are various shades of yellow, green, and brown: they are generally fluid; but some of them, as especially oil of aniseed, congeal by a very moderate reduction of temperature. They are very sparingly soluble in water, but sufficiently so to impart their smell and flavour to it. They are very readily dissolved by spirit of wine, and they boil at different temperatures. Their volatility is much increased by the presence of water, with the vapour of which they rise in distillation, at a temperature considerably below their boiling point. They are extremely combustible, and much more so than the expressed oils. Most of them are lighter than water, but some sink into that fluid: among the former are the oils of lavender, rosemary, and mint; and of the latter, the oils of cassia, cinnamon, and cloves are examples. They are easily decomposed by sulphuric and by nitric acid, and when suddenly mixed with the latter, some of them inflame.

Like the expressed oils, they are composed of different proportions of oxygen, hydrogen, and carbon.

The volatile oils are capable of dissolving the fixed oils, and hence the latter are sometimes employed in adulterating them: this fraud may be easily detected by dropping some of the suspected oil on paper: if there be any fixed oil mixed with it, it will remain on the paper after exposure to a moderate heat. Where a cheaper volatile oil has been em-

ployed to adulterate a more costly one, the detection can scarcely be made by any other means than by the difference of odour. If spirit of wine be mixed with the oil, then, when it is dropped upon water, a milky fluid is formed, instead of there remaining a transparent film of oil on the surface of the water.

OLEUM SUCCINI.

Oil of Amber.

Put Amber into an alembic, so that an Acid Liquor, an Oil, and a Salt, contaminated with the Oil, may distil in a sand bath, with a heat gradually increased. Afterwards, let the Oil distil again and a third time.

OLEUM TEREBINTHINÆ RECTIFICATUM.

Rectified Oil of Turpentine.

Take of Oil of Turpentine a pint,
Water four pints;
Let the Oil distil.

DISTILLED WATERS.

The odour and pungency of plants frequently resides in their essential oil, and this has its volatility so much increased by the vapour of water, that they may be distilled together, and a sufficient quantity of the oil is dissolved by the water to give it the peculiar taste and smell of the plant. Distilled waters are intended merely as vehicles for the exhibition of active remedies.

When distilled waters have been long kept, they undergo a kind of decomposition, and become mucilaginous and sour.

AQUA DESTILLATA.

Distilled Water.

Take of Water ten gallons;

First let four pints distil, which being thrown away, let four gallons distil. Keep distilled Water in a glass bottle.

To each gallon of the Waters which follow, add five fluidounces of proof Spirit that they may be kept sound.

Most spring and river water contains saline impurities; these are generally carbonic acid, carbonate of lime, sulphate of lime, and common salt. There are some preparations whose power is much diminished, and whose solutions are rendered turbid by these compounds. Such, more especially, are lime water, acetate and subacetate of lead; and sulphate of iron is even decomposed by the atmospheric air which water always contains. Water may be nearly purified from carbonic acid, carbonate of lime, and atmospheric air, by mere ebullition; but by this, owing to the evaporation which takes place, the proportion of the other impurities is increased, and therefore water which has been long boiled, may be more impure even than before ebullition.

The following tests will determine the presence of the usual impurities:—

Lime Water.—If carbonic acid be present, this will cause precipitation of carbonate of lime before ebullition, but not after it.

Solution of Nitrate of Barytes.—If sulphate of lime be present, this will give a precipitate insoluble in nitric acid.

Solution of Oxalate of Ammonia.—If this give any precipitate before the water is boiled, it may be owing to the presence either of carbonate or of sulphate of lime; but if only after ebullition, then to the presence of sulphate, provided nitrate of barytes gives also a precipitate.

Solution of Nitrate of Silver.—If common salt or any muriate be contained in water, this re-agent will afford a precipitate insoluble in nitric acid.

Few chemists are, I believe, in the practice of keeping a still for the purpose of distilling water only; yet this ought always to be done, or the water will have a faint smell of the last herbs which have been subjected to distillation.

Distilled water is inodorous, and tasteless and vapid on account of the absence of air. A wine pint, at a medium temperature, weighs almost exactly 7272 grains, and a fluid-ounce consequently weighs 454.5 grains. In perfectly pure distilled water no change of appearance occurs on the addition of either lime water, nitrate of barytes, oxalate of ammonia, nitrate of silver, subacetate of lead or solution of sulphuretted hydrogen.

AQUA ANETHI.

Dill Water.

Take of Dill Seeds, bruised, a pound;

Pour on them so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA CARUI.

Carraway Water.

Take of Carraway Seeds, bruised, a pound;

Pour on them so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA CINNAMOMI.

Cinnamon Water.

Take of Cinnamon Bark, bruised, a pound, *or*
Oil of Cinnamon, *by weight*, five scruples;

Pour on the Oil or on the Bark, macerated in water

for twenty-four hours, so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA FŒNICULI.

Fennel Water.

Take of Fennel Seeds, bruised, a pound;

Pour on them so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA MENTHÆ PIPERITÆ.

Peppermint Water.

Take of Peppermint, dried,* a pound and a half, *or*
Oil of Peppermint, *by weight*, three drachms;

Pour on the Herb or on the Oil so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA MENTHÆ VIRIDIS.

Spearmint Water.

Take of Spearmint, dried,* a pound and a half, *or*
Oil of Spearmint, *by weight*, three drachms;

Pour on the Herb or on the Oil so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

* When the fresh herb is employed, double the weight is to be used.

AQUA PIMENTÆ.

Pimenta Water.

Take of Pimenta Berries, bruised, half a pound,
Water a pint;

Macerate the Berries in Water for twenty-four hours; then add so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA PULEGII.

Pennyroyal Water.

Take of Pennyroyal, dried,* a pound and a half, *or*
Oil of Pennyroyal, *by weight*, three drachms;

Pour on the Herb or on the Oil so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

AQUA ROSÆ.

Rose Water.

Take of Damask-rose Petals eight pounds;

Pour on them so much Water, that, after distillation, as much as may be sufficient may remain to prevent empyreuma. Let a gallon distil.

* See note, p. 146.

INFUSIONS.

Infusions are mere solutions of vegetable matter in water, which is sometimes used cold, but in the London Pharmacopœia it is in every instance directed to be boiling: in this state it is poured upon the substance, the active principles of which are intended to be dissolved. The aromatic, bitter, astringent, and mucilaginous properties of vegetable products are, to a considerable extent, soluble in water; while resinous bodies, on the contrary, are totally unacted upon by that fluid.

The substances infused should be only coarsely powdered, or cut into thin slices; for if they are employed in the state of fine powder, not only is the proper action prevented by the proximity of their particles, but the infusion is with difficulty rendered clear.

Hard water should, as much as possible, be avoided, for it not only acts less powerfully as a solvent, but the precipitation which takes place by boiling renders it extremely turbid, and increases the difficulty of procuring a clear infusion. The infusions prepared with cold water are weaker than those in which hot water is employed, unless the digestion be continued for a much longer time.

Dried vegetables are stated to yield their virtues by infusion more readily than when they are in a recent state.

If infusions be long kept, and especially in hot weather, they become turbid, deposite the matter which they had dissolved, and undergo decomposition; they ought, therefore, never to be kept for use longer than a few hours, but prepared for the occasion upon which they are prescribed.

INFUSUM ANTHEMIDIS.

Infusion of Chamomile.

Take of Chamomile Flowers two drachms,
Boiling Water half a pint;
Macerate for ten minutes in a vessel lightly covered, and strain.

Medicinal Use.—Stomachic, in dyspepsia; and the infusion prepared with cold water, is said to be more grateful than that made with hot. Dose, f℥i. to f℥ij.

It is employed warm for promoting the operation of emetics.

Incompatibles.—Solutions of the salts of iron, mercury, silver, and lead.

INFUSUM ARMORACIÆ COMPOSITUM.

Compound Infusion of Horse Radish.

Take of Fresh Horse Radish Root, sliced,
Mustard Seeds, bruised, of each an ounce,
Compound Spirit of Horse Radish a fluid-ounce,
Boiling Water a pint;

Macerate the Root [and the mustard seeds] in the Water for two hours in a vessel lightly covered, and strain; then add the compound Spirit of Horse Radish.

Medicinal Use.—Stimulant in paralysis. Dose, f℥iss.

Incompatibles.—Solutions of the salts of silver and mercury, and of the alkaline carbonates.

INFUSUM AURANTII COMPOSITUM.

Compound Infusion of Orange Peel.

Take of Orange Peel, dried, two drachms,
Lemon Peel, fresh, a drachm,
Cloves, bruised, half a drachm,
Boiling Water half a pint;

Macerate for a quarter of an hour in a vessel lightly covered, and strain.

Medicinal Use.—Stomachic. Dose, f℥i. to f℥ij.

INFUSUM CALUMBÆ.

Infusion of Calumba.

Take of Calumba, sliced, two drachms,
Boiling Water half a pint;
Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and stomachic. Dose, f℥jss. to f℥ij. It very soon spoils; it contains no astringent matter.
Incompatibles.—Solutions of the acetates of lead, oxymuriate of mercury and lime water.

INFUSUM CARYOPHYLLORUM.

Infusion of Cloves.

Take of Cloves, bruised, a drachm,
Boiling Water half a pint;
Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Stimulant and stomachic. Dose, f℥i. to f℥ij.
It is generally exhibited in combination with other medicines.
Incompatibles.—Lime water, solutions of the preparations of iron, zinc, lead, silver, and antimony.

INFUSUM CASCARILLÆ.

Infusion of Cascarilla.

Take of Cascarilla Bark, bruised, half an ounce,
Boiling Water half a pint;
Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and stomachic. Dose, f℥jss. to f℥ij.

Incompatibles similar to those enumerated under the last infusion.

INFUSUM CATECHU COMPOSITUM.

Compound Infusion of Catechu.

Take of Extract of Catechu two drachms and a half,
Cinnamon Bark, bruised, half a drachm,
Boiling Water half a pint;
Macerate for an hour in a vessel lightly covered, and strain.

Medicinal Use.—Astringent in diarrhœa. Dose, f℥i. to f℥iij. every four hours.

INFUSUM CINCHONÆ.

Infusion of Cinchona.

Take of Lance-leaved Cinchona Bark (pale Bark), bruised, half an ounce,
Boiling Water half a pint;
Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic in dyspepsia, &c. Dose, f℥i. to f℥iij. three or four times a day.

INFUSUM CUSPARIÆ.

Infusion of Cusparia.

Take of Cusparia Bark (Angustura Bark), bruised, two drachms,
Boiling Water half a pint;
Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic and stimulant in dyspepsia. Dose, f℥jss. to f℥ij.
Incompatibles.—The solutions of the salts of most metals.

INFUSUM DIGITALIS.

Infusion of Foxglove.

Take of Foxglove Leaves, dried, a drachm,
Spirit of Cinnamon half a fluidounce,
Boiling Water half a pint;
Macerate for four hours in a vessel lightly covered, and strain; then add the Spirit.

Medicinal Use.—Diuretic. Dose, f℥ij. to f℥ss. twice a day.
Incompatibles.—It is decomposed by solutions of the salts of iron, and probably by those of most other metals.

INFUSUM GENTIANÆ COMPOSITUM.

Compound Infusion of Gentian.

Take of Gentian Root, sliced,
Orange Peel, dried, of each a drachm,
Lemon Peel, fresh, two drachms,
Boiling Water twelve fluidounces;
Macerate for an hour in a vessel lightly covered, and strain.

Medicinal Uses.—Stomachic and tonic. Dose, f℥jss. to f℥ij.
Incompatibles.—Solution of subacetate of lead, sulphate of iron, and analogous salts.

INFUSUM LINI COMPOSITUM.

Compound Infusion of Linseed.

Take of Linseed, bruised, an ounce,
Liquorice Root, sliced, half an ounce,
Boiling Water two pints;
Macerate for four hours near the fire, in a vessel lightly covered, and strain.

Medicinal Uses.—Demulcent in dysuria and catarrh.
Incompatibles.—Preparations of lead and iron, and probably most metallic salts.

INFUSUM QUASSIÆ.

Infusion of Quassia.

Take of Quassia Wood, sliced, a scruple,
Boiling Water half a pint;

Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Stomachic and tonic. Dose, f℥jss. to f℥ij.

Incompatibles.—There are few substances which produce any effect upon this solution; even the preparations of iron are unchanged by it.

INFUSUM RHEI.

Infusion of Rhubarb.

Take of Rhubarb Root, sliced, a drachm,
Boiling Water half a pint;

Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Stomachic and tonic. Dose, f℥i. to f℥iij.

Incompatibles.—The stronger acids, metallic solutions, some astringent infusions. The alkalies darken the colour of this infusion, but do not decompose it.

INFUSUM ROSÆ COMPOSITUM.

Compound Infusion of Roses.

Take of Red Rose Petals, dried, half an ounce,
Diluted Sulphuric Acid three fluidrachms,
Refined Sugar an ounce and a half,
Boiling Water two pints and a half;

Pour the Water upon the Rose Petals in a glass vessel; then mix in the Acid, and macerate for half an hour. Lastly, strain the liquor, and add the Sugar to it.

Medicinal Uses.—Astringent and refrigerant. Dose, f℥j. to f℥jss. or more.

Incompatibles.—Alkalies and earths, and all substances which combine with sulphuric acid, or are acted upon by small quantities of it; acetate of lead of course throws down a copious precipitate. Sulphate of iron gives it a brown colour, but no precipitate is formed for some hours. It is much employed as a vehicle for the exhibition of cathartic salts.

INFUSUM SENNÆ COMPOSITUM.

Compound Infusion of Senna.

Take of Senna Leaves an ounce and a half,
Ginger Root, sliced, a drachm,
Boiling Water a pint;

Macerate for an hour in a vessel lightly covered, and strain the liquor.

Medicinal Use.—Purgative. Dose, f℥iij. to f℥iv.

This infusion spoils quickly; when exposed to the air a yellow precipitate is formed in it, and its purgative qualities are lost.

Incompatibles.—Strong acids, lime water, and most metallic salts.

INFUSUM SIMAROUBÆ.

Infusion of Simarouba.

Take of Simarouba Bark, bruised, half a drachm,
Boiling Water half a pint;

Macerate for two hours in a vessel lightly covered, and strain.

Medicinal Uses.—Tonic, in the latter stages of dysentery. Dose, f℥ij.

Incompatibles.—Lime water, alkaline carbonates; many metallic salts, especially those of lead, silver and mercury.

INFUSUM TABACI.

Infusion of Tobacco.

Take of Tobacco Leaves a drachm,
Boiling Water a pint;
Macerate for an hour in a vessel lightly covered, and strain.

This is employed only as an enema in incarcerated hernia and in ileus.

MUCILAGES.

Mucilages are viscid solutions of gummy matter in water; or mixtures of them without solution. They are prepared in some instances by merely triturating the mucilaginous matter with cold water, and in other cases hot water is employed; some of the substances used in these preparations are insoluble in cold water, such as starch and tragacanth, but they render the water sufficiently mucilaginous by mere mixture with it.

Mucilages are chiefly used as vehicles for other substances, either to suspend powders in liquids, to diffuse oils or resinous matter in water, or to give form and tenacity to pills.

MUCILAGO ACACIÆ.

Mucilage of Acacia. (Gum Arabic.)

Take of Acacia Gum (Gum Arabic), powdered, four ounces,
Boiling Water half a pint;

Rub the Gum with the Water, gradually dropped in, until it turns to Mucilage.

MUCILAGO AMYLI.

Mucilage of Starch.

Take of Starch three drachms,
Water a pint;
Rub the Starch with the Water gradually dropped in; afterwards boil, until it turns to Mucilage.

The starch should be perfectly white, and not rendered blue, as it usually is, by smalts.

DECOCTIONS.

Decoctions differ from hot infusions only in the application of a longer continued heat; by this the solvent power of the water is increased, and some substances which are sparingly dissolved by mere infusion in hot water, have their virtues readily extracted by boiling in it.

In some cases, however, infusions contain more of the active principle of medicines than decoctions; thus aromatics and substances, which contain essential oils, are diminished in power by their volatilization during the long continued action of the heat. Another circumstance to be noticed is this, that some of the principles, which are dissolved by hot water, are deposited as the solution cools; this is particularly the case with cinchona, and therefore this decoction should always be exhibited turbid, from the suspension of particles which had become insoluble by cooling. Decoctions should always be strained hot, for the reasons which have been just stated, and they ought to be prepared either with soft or with distilled water; undistilled water which has been long boiled should be especially avoided.

Decoctions suffer decomposition by being kept, in the same manner as infusions, and consequently they ought to be prepared only a very few hours before they are intended for use.

DECOCTUM ALOES COMPOSITUM.

Compound Decoction of Aloes.

Take of Extract of Liquorice half an ounce,
Subcarbonate of Potash two scruples,
Extract of Spiked Aloe, powdered,
Myrrh, powdered,
Saffron, of each a drachm,
Compound Tincture of Cardamom four fluidounces,
Water a pint;

Boil down the Liquorice, Subcarbonate of Potash, Aloes, Myrrh, and Saffron, with the Water, to twelve fluidounces, and strain; then add the Compound Tincture of Cardamom.

Medicinal Uses.—Mildly cathartic. Dose, from f℥ss. to f℥j.

Incompatibles.—Acids, acidulous salts, earthy and metallic salts, and all substances which are decomposed by subcarbonate of potash, or which decompose it.

DECOCTUM CINCHONÆ.

Decoction of Cinchona.

Take of Lance-leaved Cinchona Bark (pale Bark), bruised, an ounce,
Water a pint;

Boil for ten minutes in a vessel lightly covered, and strain the liquor while hot.

Medicinal Uses.—Tonic in dyspepsia, &c. Dose, from f℥j. to f℥iij. two or three times a day. Although cinchona in the form of decoction is less powerful than when exhibited in substance, yet in the former state it may be taken by persons with whom the powder would not agree.

It has been found that all the varieties of cinchona contain peculiar vegetable bodies possessing alkaline properties, and in which their medicinal powers appear to reside. The cinchona lancifolia, or pale bark, directed to be used in preparing the decoction, in addition to other vegetable products, contains the vegetable alkali cinchonia, combined with a peculiar acid, called the kinic acid, which is rather in excess; the compound is kinate of cinchonia.

Cinchona cordifolia, or yellow bark, contains a vegetable alkaline base different from cinchonia, and which has been called quina: cinchona oblongifolia, or red bark, yields both cinchonia and quina, and in larger quantity than the other varieties.

Various processes have been employed for preparing cinchonia; the best, probably, consists in boiling the pale bark, bruised, in successive portions of very dilute sulphuric acid, mixing and evaporating the decoctions, and then adding a slight excess of lime, mixed with water, to the acidulous solution. In this operation sulphate of cinchonia is first formed, and then decomposed by the lime, which combining with the sulphuric acid, separates the cinchonia from it. The precipitate is a mixture of cinchonia and sulphate of lime, with some excess of base; this is to be pressed, dried, and then digested in alcohol, which dissolves the cinchonia only; the clear solution being subjected to distillation, the spirit is separated and the cinchonia left.

Cinchonia is white, translucent, crystalline, and soluble in 2500 times its weight of boiling water, but a considerable part separates in cooling. Its taste is bitter, though long in being developed, owing to its insolubility; but its acid solutions have a strong taste of the bark itself. It is neither fusible nor volatile at moderate temperatures. It is very soluble in alcohol and ether, and sparingly so in fixed and volatile oils.

Cinchonia restores the colour of litmus, which has been reddened by an acid; unites with all the acids, and, with the greater number, forms compounds which are perfectly neutral; the muriate is very soluble in water, dissolves in alcohol and crystallizes in delicate prisms; the nitrate does not crystallize, while the oxalate, tartrate, and gallate of cinchonia are insoluble; hence it is that infusion of galls precipitates the decoction of bark.

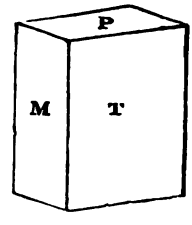
There exists great difference in the results of the analysis of cinchonia, it is composed of, according to Mr. Brande,

Carbon	79.30
Azote	13.72
Hydrogen	7.18
	100.20

M. M. Dumas and Pelletier,

Carbon	76.97
Azote	9.02
Hydrogen	6.22
Oxygen	7.97
	100.18

Sulphate of cinchonia is a colourless crystalline salt, readily soluble in water; it possesses the peculiar flavour of the bark; the primary form of the crystal of sulphate of cinchonia appears to be a *doubly oblique prism*, having cleavages parallel to all its planes; the cleavage parallel to P is not very distinct; there are some crystals which do not appear to be immediately related to this form; they are probably hemitrope, or rather quadruple crystals, united by their secondary planes; but they were not, in the specimen examined, sufficiently distinct in character to admit their precise relations to the primary form to be traced.



P on M	95°	50′
P on T	90	0
M on T	83	30

Sulphate of Cinchonia in the crystalline form is stated to consist of nearly

Sulphuric Acid	11
Cinchonia	84
Water	5
	100

Quina.—This alkaline base may be obtained from yellow bark, by a process similar to that employed for the preparation of cinchonia from pale bark. It is not crystallizable,

but, when dried, presents a whitish porous mass, almost insoluble in water, but extremely bitter. It is distinguished also from cinchonia by its forming, with the same acids, salts which differ as to their form, and the proportion of their elements.

The following are the results of the analysis of this substance by the chemists above named; and it appears by Mr. Brande's analysis that quina differs from cinchonia in containing oxygen; while according to MM. Dumas and Pelletier, it exists in both.

	Mr. Brande.	MM. Dumas & Pelletier.
Carbon	73.80	75.02
Azote	13.00	8.45
Hydrogen	7.65	6.66
Oxygen	5.55	10.43
	100.00	100.56

Sulphate of quina forms crystals which are remarkable for their pearly lustre. It is soluble in cold water, a property which is much increased by excess of acid. This preparation is considered as the most active form of the salifiable principle of yellow bark; for the method of preparing it, I may refer the reader to Dr. Paris's Pharmacologia, vol. ii. p. 145.

Sulphate of quina, in the state of crystals, is composed nearly of

Sulphuric acid	8.5
Quina	76.5
Water	15
	100.0

Sulphate of quina has lately been employed in medicine, with the same intentions as the bark itself; given in doses of 5 grains it is stated to have cured cases of intermittent fever which have resisted bark, although perfectly well borne, and freely administered. Quina, uncombined with an acid, appears to be capable of producing similar effects; but for a more particular account of the use of these substances, I beg to refer to a paper by Dr. Elliotson, in the 12th vol. of the Medico-Chirurgical Transactions.

Kinic Acid is obtained by macerating cinchona in cold water; the infusion, after concentration, is to be set aside in

an open vessel, and a salt will be obtained in plates, which is tasteless, soluble in cold water, and insoluble in alcohol. This salt is kinate of lime; when oxalic acid is added to it, oxalate of lime is precipitated, and the solution by evaporation yields divergent crystals of kinic acid of a brownish colour, and a very acid taste, and rather bitter. It is distinguishable from other vegetable acids by forming a soluble salt with lime, and by its not precipitating lead or silver from their respective solutions.

DECOCTUM CYDONIÆ.

Decoction of Quince (Seeds.)

Take of Quince Seeds two drachms,
Water a pint;
Boil over a slow fire for ten minutes; afterwards strain.

Medicinal Uses.—Quince seeds contain a large quantity of inodorous and insipid mucilaginous matter, which is readily dissolved by water. The decoction is viscid and nearly colourless; it has been recommended as an application to erysipelatous surfaces: it is also employed in aphthous affections and excoriations of the mouth, &c. It very readily suffers decomposition, and on this account should never be kept ready prepared.

Incompatibles.—Alcohol, acids, and most metallic solutions.

DECOCTUM DULCAMARÆ.

Decoction of Woody Nightshade.

Take of Woody Nightshade Stalks, sliced, an ounce,
Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Uses.—Diuretic and narcotic. Dose, from f℥jv. to f℥j. three times a day, combined with an aromatic.

DECOCTUM HORDEI.

Decoction of Barley.

Take of Barley Seeds (Pearl Barley) two ounces,
Water four pints and a half;

First wash away with cold water the foreign matters from the Barley Seeds; afterwards, half a pint of the Water being poured upon them, boil the Seeds a little while. This Water being thrown away, pour on that which is left, first made hot; then boil down to two pints, and strain.

DECOCTUM HORDEI COMPOSITUM.

Compound Decoction of Barley.

Take of Decoction of Barley two pints,
Figs, sliced, two ounces,
Liquorice Root, sliced and bruised, half an ounce,
Raisins, stoned, two ounces,
Water a pint;

Boil down to two pints, and strain.

Medicinal Uses.—This and the former decoction are useful demulcents in fever, phthisis, gonnorhœa and strangury, given *ad libitum*.

DECOCTUM LICHENIS.

Decoction of Liverwort.

Take of Liverwort an ounce,
Water a pint and a half;
Boil down to a pint, and strain.

Medicinal Uses.—Boiling water extracts the mucilage of the lichen; this decoction is employed as a demulcent, and as a mild nutritious substance, easy of digestion; it is less disagreeable when the bitter matter of the lichen has been previously removed by maceration. Dose, a wine-glass full occasionally.

DECOCTUM MALVÆ COMPOSITUM.

Compound Decoction of Mallow.

Take of Mallow, dried, an ounce,
Chamomile Flowers, dried, half an ounce,
Water a pint;
Boil for a quarter of an hour, and strain.

Medicinal Uses.—This decoction is employed in fomentations and enemas.

DECOCTUM PAPAVERIS.

Decoction of Poppy.

Take of Poppy Capsules, sliced, four ounces,
Water four pints;
Boil for a quarter of an hour, and strain.

Medicinal Uses.—External as an anodyne fomentation in painful swellings, and in the excoriations produced by the acrid discharge of ulcers. It is recommended that the seeds should not be rejected.

DECOCTUM QUERCUS.

Decoction of Oak (Bark).

Take of Oak Bark, an ounce,
Water two pints;
Boil down to a pint, and strain.

Medicinal Uses.—This decoction is principally employed in the form of gargle, injection or lotion, as a local astringent. It is nearly inodorous, and its taste is strongly astringent.

Incompatibles.—Decoction of yellow bark, most metallic salts, solution of isinglass; alkaline solutions destroy its astringency.

DECOCTUM SARSAPARILLÆ.

Decoction of Sarsaparilla.

Take of Sarsaparilla Root, sliced, four ounces,
Boiling Water four pints;
Macerate for four hours in a vessel lightly covered, near the fire; then take out and bruise the Sarsaparilla Root. When bruised, return it to the liquor, and again macerate in the same manner for two hours; afterwards boil down to two pints, and strain.

Medicinal Uses.—Alterative, Demulcent. Dose from f ℥ iv. to f ℥ viij. three or four times a day.

Incompatibles.—Lime-water and acetate of lead, and also some solutions of mercury.

DECOCTUM SARSAPARILLÆ COMPOSITUM.

Compound Decoction of Sarsaparilla.

Take of Decoction of Sarsaparilla, boiling, four pints,
Sassafras Root, sliced,
Guaiacum Wood shavings,
Liquorice Root, bruised, of each an ounce,
Mezereon Root Bark, three drachms;
Boil for a quarter of an hour, and strain.

Medicinal Uses.—Diaphoretic and alterative. It is esteemed to be useful in secondary syphilis and in rheumatism. Dose, f℥iv. to f℥vj. three or four times a day.

DECOCTUM SENEGÆ.

Decoction of Senega.

Take of Senega Root an ounce,
Water two pints;
Boil down to a pint, and strain.

Medicinal Uses.—Expectorant, diuretic and diaphoretic. It has been recommended in pneumonic affections attended with accumulation of mucus in the bronchia, and as a diaphoretic in chronic rheumatism. Dose, f℥iss. to f℥iij. two or three times a day.

DECOCTUM ULMI.

Decoction of Elm (Bark).

Take of Fresh Elm Bark, bruised, four ounces,
Water four pints;
Boil down to two pints, and strain.

Medicinal Uses.—Diuretic, and in herpetic eruptions. Its powers are questionable. Dose, f℥iv. to f℥vj. three or four times a day.

DECOCTUM VERATRI.

Decoction of White Hellebore.

Take of White Hellebore Root, bruised, an ounce,
Water two pints,
Rectified Spirit, two fluidounces;
Boil the Hellebore Root in the Water down to a pint, and strain; then, when it has cooled, add the Spirit.

Medicinal Uses.—It is employed externally as a lotion in scabies, tinea capitis, and other cutaneous eruptions.

EXTRACTS.

Extracts are those preparations which are obtained when vegetable substances are boiled in water, or have their soluble parts dissolved in proof spirit of wine, or when the expressed juices of recent plants are boiled down until of a proper consistence for forming into pills; and in some cases, the evaporation is carried so far that the extract is reducible to powder.

As the medicinal power of some vegetable substances resides, to a certain extent, in principles which are insoluble in water, but dissolve in spirit of wine, different modes of operating are adopted; in the first case, that is, when the virtues of the medicines are completely soluble in water, such for example as those of gentian, the extract is termed a watery extract; when the vegetable contains resinous or other matter insoluble in water, it is extracted by spirit, and then termed a spirituous extract; while the juice of recent plants, when evaporated to a proper degree, are called sometimes inspissated juices, but they are now classed by the College with the extracts.

That part of vegetable bodies which is soluble in water, and reduced by evaporation to the state of extract, has, on this account, received the name of extractive matter, extract or extractive; it is evident, however, that extracts consist of all the various substances soluble in water, and they must therefore contain very different ingredients.

In preparing all Extracts, evaporate the water, by a water bath, in a pan, as quickly as possible, until a proper consistence is acquired for forming pills, and towards the end stir constantly with a spatula.

Sprinkle upon all softer extracts, a little rectified spirit.

EXTRACTUM ACONITI.

Extract of Aconite.

Take of Aconite Leaves, fresh, a pound;

Bruise them in a stone mortar, sprinkled with a little water; then press out the juice, and evaporate it unstrained, until it acquires a proper consistence.

Medicinal Uses.—Narcotic; in some cases diuretic. The dose should not at first exceed half a grain; but it may be gradually increased to gr. v. The medicinal power of aconite is stated to reside in a peculiar alkaline body, which has been termed *aconita*. This extract is of a brown colour; it has a disagreeable smell, and an acrid taste, and is not much employed.

EXTRACTUM ALÖES PURIFICATUM.

Purified Extract of Aloes.

Take of Extract of Spiked Aloe, powdered, a pound,
Boiling Water a gallon;

Macerate for three days with a gentle heat; afterwards strain, and set by, that the dregs may subside. Pour off the clear liquor, and evaporate until it acquires a proper consistence.

Medicinal Uses.—Purgative. Stomachic. Dose, gr. v. to gr. xv. By solution in water this medicine is deprived of its resinous matter, and it is then said to be less irritating and more purgative in equal doses.

EXTRACTUM ANTHEMIDIS.

Extract of Chamomile.

Take of Chamomile Flowers, dried, a pound,
Water a gallon;

Boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Uses.—Tonic. Stomachic. Dose, gr. x. to gr. xx. twice a day. It is generally exhibited in combination with rhubarb, or some other medicine of the same class. This extract is of a deep brown colour, and has a bitter taste. It does not possess the peculiar odour of the chamomile, for the volatile oil upon which that depends, is dissipated during ebullition.

EXTRACTUM BELLADONNÆ.

Extract of Deadly Nightshade.

Take of Deadly Nightshade Leaves, fresh, a pound;

Bruise them in a stone mortar, sprinkled with a little Water; afterwards press out the juice, and evaporate unstrained, until it acquires a proper consistence.

Medicinal Uses.—Narcotic. Diuretic. Dose, gr. j. to gr. v. cautiously administered, for an overdose produces great distress; and even when taken in small doses for a considerable length of time, it induces sickness, vertigo and dimness of sight, with other effects indicating the propriety of discontinuing the use of it. In large doses it is poisonous. The virtues of belladonna, appear to reside in a peculiar alkaline base which has been called *atropia*.

EXTRACTUM CINCHONÆ.

Extract of Cinchona.

Take of lance-leaved Cinchona Bark (pale Bark), bruised, a pound,

Water a gallon;

Boil down to six pints, and strain the liquor while hot. In the same manner, boil down four times in an equal quantity of Water, and strain. Lastly, evaporate all the liquors mixed together, until they acquire a proper consistence.

This Extract should be kept *soft*, which may be fit to form pills, and *hard*, which may be rubbed to powder.

Medicinal Uses.—Tonic. Stomachic. Dose, gr. x. to gr. xxx. This extract is of a dark brown colour, of a bitter

taste, and is nearly inodorous. The active matter of cinchona is more soluble in spirit than in water; during ebullition, however, a considerable portion of it is dissolved by the water, but by the exposure to air, which takes place during evaporation, a part of the extract is deteriorated by oxidizement, and consequently the extract is not equal in efficacy to the quantity of bark from which it is procured.

EXTRACTUM CINCHONÆ RESINOSUM.

Resinous Extract of Cinchona.

Take of lance-leaved Cinchona Bark (pale Bark), bruised, two pounds,
Rectified Spirit a gallon;
Macerate for four days, and strain. Let the tincture distil in a water-bath, until it acquires a proper consistence.

Medicinal Uses.—Tonic. Stomachic. Dose, gr. x. to gr. xxx. The spirit extracts from the cinchona such parts of it as are insoluble in water; this extract is therefore, probably, more powerful than the former; their external qualities do not greatly differ.

EXTRACTUM COLOCYNTHIDIS.

Extract of Colocynth.

Take of Pulp of Colocynth a pound,
Water a gallon;
Boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Use.—Cathartic. Dose, gr. v. to gr. xxx. It is a dark coloured and extremely bitter extract.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM.

Compound Extract of Colocynth.

Take of Pulp of Colocynth, sliced, six ounces,
Extract of Spiked Aloe, powdered, twelve ounces,
Scammony Gum Resin, powdered, four ounces
Cardamom Seeds, powdered, an ounce,
Hard Soap three ounces,
Proof Spirit a gallon;

Macerate the Pulp of Colocynth in the Spirit, with a gentle heat, for four days. Strain the liquor, and add to it the Aloes, Scammony and Soap; afterwards evaporate the Spirit, until it acquires a proper consistence, and, towards the end, mix in the Cardamom Seeds.

Medicinal Uses.—Cathartic. Dose, gr. v. to gr. xxx. It is esteemed to be particularly efficacious in relieving habitual costiveness, and obstinate visceral obstruction, when combined with calomel.

EXTRACTUM CONII.

Extract of Hemlock.

Take of fresh Hemlock a pound;

Bruise it in a stone mortar, sprinkled with a little Water; afterwards, press out the juice, and evaporate unstrained, until it acquires a proper consistence.

Medicinal Uses.—Narcotic. Sedative. Dose, gr. v. to gr. xx. or more.

This extract has a brownish green colour, and a disagree-

able smell and taste. According to Dr. Paris, the whole virtues of the plant reside in a peculiar resinous matter insoluble in water, and for which he has proposed the name of *conein*. In too large doses it produces giddiness, nausea, and tremor, a heavy sensation is experienced about the eyes, and the bowels are gently relaxed; until, however, the production of one or more of these sensations, there is no certainty that the use of the medicine has been sufficiently persisted in.

EXTRACTUM ELATERII.

Extract of Elaterium.

Slice ripe wild Cucumbers, and strain the juice, very gently expressed, through a very fine hair sieve into a glass vessel; then set it aside for some hours, until the thicker part has subsided. The thinner supernatant part being rejected, dry the thicker part with a gentle heat.

Medicinal Uses.—Hydragogue. Cathartic. Dose, from half a grain to two grains. This extract has a greenish colour, its taste is bitter and rather acrid; and when tolerably pure, it is light, pulverulent and inflammable. Its properties have been particularly examined by Dr. Paris, and according to his experiments, they reside in a peculiar substance which he has called *elatin*, and of which the extract contains only about 10 per cent.—Pharmacologia, vol. ii. p. 241. 5th edit.

EXTRACTUM GENTIANÆ.

Extract of Gentian.

Take of Gentian Root, sliced, a pound,
Boiling Water a gallon;
Macerate for twenty-four hours; then boil down to four

pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Uses.—Tonic. Stomachic. Dose, gr. x. to gr. xxx. twice or three times a day. This extract is of a dark brown colour, nearly inodorous and bitter. It is frequently exhibited in combination with chalybeates.

EXTRACTUM GLYCYRRHIZÆ.

Extract of Liquorice.

Take of Liquorice Root, sliced, a pound,
Boiling Water a gallon;
Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Use.—Demulcent in tickling coughs. This extract is usually imported from Spain, and when it has had a fresh form given to it, is sold under the name of refined liquorice.

EXTRACTUM HÆMATOXYLI.

Extract of Logwood.

Take of Logwood, powdered, a pound,
Boiling Water a gallon;
Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Uses.—Astringent in protracted diarrhœa and dysentery. Dose, gr. x. to gr. xxx. in some aromatic distilled

water. This extract is of a deep red colour, and has a sweetish astringent taste. It becomes very hard by keeping, so that pills made of it pass through the body unchanged. It is said to contain a peculiar vegetable matter, which has been called *hæmatin*.

EXTRACTUM HUMULI.

Extract of Hops.

Take of Hops four ounces,
Water a gallon;
Boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Use.—Sedative. Dose, gr. v. to gr. xx. Its efficacy is questionable. It is a dark bitter extract, totally devoid of the aromatic principle of the hop. The virtues of the hop have been stated to reside in a peculiar substance which has been called *lupulin*.

EXTRACTUM HYOSCYAMI.

Extract of Henbane.

Take of fresh Henbane Leaves a pound;
Bruise them in a stone mortar, sprinkled with a little Water; afterwards press out the juice, and evaporate unstrained, until it acquires a proper consistence.

Medicinal Uses.—Narcotic. Dose, gr. v. to gr. xx. in pills. It is particularly employed in those cases in which the costiveness frequently induced by opium would be hurtful. This extract has a brownish green colour, with a disagreeable

smell and taste. Like many other narcotics, its virtues appear to reside in an alkaline substance, to which the name of *hyoscyama* has been given.

EXTRACTUM JALAPÆ.

Extract of Jalap.

Take of Jalap Root, powdered, a pound,
Rectified Spirit four pints,
Water a gallon;

Macerate the Jalap Root in the Spirit for four days, and pour off the tincture. Boil down the residue in the Water to two pints; afterwards strain the tincture and the decoction separately, and let the latter be evaporated, and the former distil, until each thickens. Lastly, mix the Extract with the Resin, and evaporate until it acquires a proper consistence.

This Extract should be kept *soft*, which may be fit to form pills, and *hard*, which may be rubbed to powder.

Medicinal Use.—Purgative. Dose, gr. x. to gr. xx. This extract is nearly inodorous, has a brown colour and a bitter taste.

EXTRACTUM LACTUCÆ.

Extract of Lettuce.

Take of fresh Lettuce Leaves a pound;

Bruise them in a stone mortar, sprinkled with a little Water; afterwards press out the juice, and evaporate unstrained, until it acquires a proper consistence.

Medicinal Use.—Narcotic. Dose, gr. v. to gr. xv. The powers of this preparation are, however, very questionable. The virtues of the lettuce appear to reside in a peculiar principle, which Dr. Duncan has called *lactucarium*.

EXTRACTUM OPII.

Extract of Opium.

Take of Opium, sliced, sixteen ounces,
Water a gallon;

Add a little Water to the Opium, and macerate for twelve hours, that it may soften; then, the remaining Water being poured in gradually, rub them until they are very well mixed, and set by, that the dregs may subside; afterwards strain the liquor, and evaporate until it acquires a proper consistence.

Process.—Opium, as I shall presently more particularly mention, contains two peculiar vegetable compounds, in which its power resides; one of these is an alkaline substance called *morphia;* the other does not possess similar chemical properties, and has received the name of *narcotine*. Morphia exists in opium in combination with a peculiar acid called the *meconic acid*, and the salt is termed *meconate of morphia*. The acid has no narcotic power.

It appears to me that much of the power of opium is lost, in the method of purification directed by the College. I subjected 72 parts of opium to the heat of steam, until it became pulverizable, and then treated it with cold water, in the manner above directed; the residuum being dried and weighed, shewed that 30 parts of opium had been dissolved; by boiling in water 9 additional parts were taken up, and rectified spirit, with the assistance of heat, dissolved 7 parts more. These experiments show that more than one-third of the extractive matter of the opium is lost by using cold water only; that the part insoluble in water contains narcotic power, is proved by the observations of Sertuerner, who directs that tincture of opium should not only be prepared

with pure alcohol, but kept in a moderately warm place, to prevent the separation of morphia which occurs in a cold one.

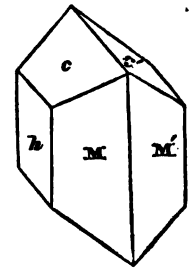
Qualities.—Although the cold infusion of opium possesses the peculiar smell of the drug, yet it is dissipated during evaporation, so that the extract is nearly inodorous. It is of a brown colour, and has a bitter taste. Dose, gr. j. to gr. v. for an adult. The form of extract is to be preferred to that of tincture, when it is intended to continue the operation of the medicine, and not to obtain its full effects at once; but in cases of accident, or in which the effects of opium are to be called into immediate action, the tincture should be employed. The vegetable acids appear to increase the solvent action of water, with respect to opium, without interfering with or diminishing its narcotic power.

I shall now give a brief account of the peculiar bodies contained in opium, and to which its narcotic properties are owing.

Morphia, and process for procuring it.—Macerate 30 parts of opium during five days in 100 parts of water, frequently stirring the mixture; filter the solution, and add to it two parts of magnesia, free from carbonic acid; boil the mixture for ten minutes, separate the sediment by a filter, and wash it with cold water until it runs through colourless: after this treat it with spirit of sp. gr. 0.985, alternately hot and cold, as long as any colouring matter is dissolved; the residuum is then to be boiled in spirit of sp. gr. 0.915 for a few minutes; the morphia will be dissolved by the spirit, and deposited in crystals as it cools.

The meconate of morphia, which the water has dissolved, is decomposed by the magnesia, and meconate of magnesia is formed; the morphia being but little soluble in water is precipitated, and remains mixed with the undissolved magnesia: by the action of water, and of weak spirit, alternately hot and cold, the colouring matter is dissolved, and the magnesia and morphia left, and when these are boiled in stronger spirit the morphia only is dissolved, and being less soluble in cold than in hot spirit, it crystallizes on the cooling of the solution.

Qualities.—Morphia, when pure, is colourless, inodorous, and intensely bitter; the crystals have a pearly lustre, and their primary form is a *right rhombic prism*, only the lateral planes of which appear on the crystals; one cleavage only has been obtained parallel to the plane *h*.



M on M'	127°	20'
M on *h*	116	20
h on *c*	132	20
c on *c'*	95	20

It is sparingly soluble even in boiling water, but dissolves readily in boiling alcohol; these solutions have alkaline properties, turning vegetable yellows reddish brown, and blues green. It exhibits the powers of an alkali, not only in combining with acids to form salts, but also by decomposing the solutions of metallic salts, precipitating their oxides, owing to its greater affinity for the acids with which they are combined.

By strong heat morphia is decomposed, yielding carbonate of ammonia, oil and charcoal; it burns readily in atmospheric air.

Morphia may also be obtained by adding a solution of ammonia to one of opium in acetic acid; the acetate of morphia formed is decomposed, and the morphia is immediately precipitated of a brownish colour, which may be removed by boiling in water with animal charcoal.

The following acids form crystallizable salts with morphia: the acetic, carbonic, sulphuric, muriatic, nitric, meconic, and tartaric.

Composition.—The following are the results of the analysis of morphia by

	Dumas and Pelletier.	Brande.	Bussy.
Carbon	72.02	72.20	69.0
Azote	5.53	5.50	4.5
Hydrogen	7.01	5.50	6.5
Oxygen	14.84	17.00	20.0
	99.40	100.20	100.0

Medicinal Uses.—Although it seems sufficiently proved that morphia possesses the characteristic properties of opium, yet its strength is not commensurate with its apparent con-

centration; and, when uncombined, it exerts but little action, in consequence of its insolubility; the spirituous solution being exhibited in repeated doses, each containing half a grain of morphia, the effects produced were at first excitation, then weakness, numbness, and tendency to fainting; vinegar being then swallowed caused violent vomiting.

Meconic acid, and process for obtaining it.—Dissolve the magnesian residuum, left after the action of the hot spirit in procuring morphia, in dilute sulphuric acid, and add muriate of barytes to the solution; a rose coloured precipitate falls, which consists of sulphate and meconate of barytes; digest this with hot and very weak sulphuric acid; the filtered solution when reduced in quantity by evaporation, yields coloured crystals of meconic acid, even before it is cold: these are to be washed with a little water, dried, and sublimed in a flask.

Qualities.—This acid is readily soluble both in alcohol and in water; the solution has a sour taste, and turns vegetable blue colours red. Meconic acid combines with alkalies to form salts, termed meconates, several of which crystallize. The distinguishing property of meconic acid is, that it produces an intense red colour when added to solutions of peroxide of iron. It has not been analyzed.

Narcotine, and process for obtaining it.—Evaporate an aqueous solution of opium until it has acquired the consistence of syrup, and then mix it with sulphuric ether, and shake the mixture: repeat this with fresh portions of ether, as long as it deposits any crystals of narcotine on distillation.

Qualities.—The crystals of this substance have a pearly lustre, are soluble in fixed oil, and in acids; slightly soluble in alcohol, and insoluble in water; they have no action on vegetable colours, and are incapable of neutralizing alkalies.

Medicinal Qualities.—It is supposed that the excitement which opium produces is owing to narcotine, and the subsequent sedative effect more particularly to morphia.

Composition.—According to M. M. Dumas and Pelletier, narcotine consists of

Carbon	68.88
Azote	7.21
Hydrogen	5.91
Oxygen	18.00
	100.00

The watery solution of opium indicates the presence of an acid by turning vegetable blues red; whether this effect is owing to the presence of meconate of morphia with excess of acid, or whether it is derived from the presence of another acid contained in opium, has not, I believe, been ascertained; it appears, however, that this acid differs from the meconic, in not being volatile, and in producing no peculiar effect upon the salts of peroxide of iron.

EXTRACTUM PAPAVERIS.

Extract of Poppy.

Take of Poppy Capsules, bruised, the seeds being taken out, a pound,
Boiling Water a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Uses.—Anodyne. Narcotic. Dose, from gr. ij. to gr. xx. given in the form of pills. This extract is said to be less apt than opium to occasion nausea, head-ache, and delirium, and therefore to be preferred for procuring sleep in diseases in which the head is much affected.

EXTRACTUM RHEI.

Extract of Rhubarb.

Take of Rhubarb Root, powdered, a pound,
Proof Spirit a pint,
Water seven pints;

Macerate for four days with a gentle heat; afterwards strain, and set by, that the dregs may subside. Pour off the liquor, and evaporate when strained, until it acquires a proper consistence.

Medicinal Use.—Purgative. Dose, from gr. x. to gr. xxx. in the form of pills, or dissolved in an aromatic water. The powers of rhubarb are said to be much diminished during the process of extraction.

EXTRACTUM SARSAPARILLÆ.

Extract of Sarsaparilla.

Take of Sarsaparilla Root, sliced, a pound,
Boiling Water a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Use.—Alterative. Dose, gr. x. to ʒj. given in pills, or dissolved in the decoction. Its virtues are much questioned.

EXTRACTUM STRAMONII.

Extract of Thorn Apple.

Take of Thorn Apple Seeds a pound,
Boiling Water a gallon;

Macerate for four hours in a vessel lightly covered, near the fire: afterwards take out the Seeds, and bruise them in a stone mortar: return them when bruised to the liquor. Then boil down to four pints, and strain the liquor while hot. Lastly, evaporate until it acquires a proper consistence.

Medicinal Use.—Narcotic. Dose, gr. ¾ to gr. ij. daily, in maniacal and asthmatic affections.

EXTRACTUM TARAXACI.

Extract of Dandelion.

Take of fresh Dandelion Root, bruised, a pound,
Boiling Water a gallon;
Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate until it acquires a proper consistence.

Medicinal Uses.—Aperient. Deobstruent. Dose, gr. x. to 3j. in obstructions of the liver, and in visceral diseases.

MIXTURES.

The term *mixture* was originally employed in pharmacy to denote those preparations, in which a soluble substance forming a viscid solution with water, was used to suspend an insoluble one; as when gum arabic is dissolved for the purpose of holding chalk in mechanical mixture; there are a few of the preparations now classed as mixtures which are scarcely included in this definition; and, in prescribing, the term mixture is frequently used to signify a compound, all the ingredients of which are in perfect solution.

MISTURA AMMONIACI.

Mixture of Ammoniac.

Take of Ammoniac two drachms,
Water half a pint;
Rub the Ammoniac with the Water gradually poured in, until they are very well mixed.

Medicinal Use.—Expectorant. Dose, f℥ss. to f℥j. It may be advantageously combined with tincture of squills, and more so than with the vinegar of the same medicine, for it is slightly curdled by acids. In this mixture the resinous and insoluble matter of the ammoniacum is suspended by the solution of its gummy constituent.

MISTURA AMYGDALARUM.

Mixture of Almonds.

Take of Confection of Almonds two ounces,
Distilled Water a pint;
Add the Water to the Confection of Almonds gradually while rubbing them, until they are mixed; afterwards strain.

Medicinal Uses.—Demulcent and diluent. It is generally employed as a vehicle for more active medicines. Acids, spirit of wine, and of course, tinctures, render this preparation turbid, and should not be exhibited with it.

MISTURA ASSAFŒTIDÆ.

Mixture of Assafœtida.

Take of Assafœtida two drachms,
Water half a pint;
Rub the Assafœtida with the Water, gradually poured in, until they are very well mixed.

Medicinal Use.—Antispasmodic. Dose, from f℥ss. to f℥j. repeated at short intervals in hysteric paroxysms. As it is extremely nauseous, it is rarely used, except as an enema in worms, and the convulsions of infants, arising from irritation of the bowels during dentition.

MISTURA CAMPHORÆ.

Mixture of Camphor.

Take of Camphor half a drachm,
Rectified Spirit ten minims,
Water a pint;

First rub the Camphor with the Spirit, then with the Water gradually poured in, and strain.

Medicinal Use.—Stimulant. Dose, f℥j. to f℥ij. every three or four hours. Water dissolves very little camphor; this mixture is therefore generally used only as a vehicle for important medicines.

MISTURA CORNU USTI.

Mixture of Burnt Horn.

Take of Burnt Horns two ounces,
Gum Arabic, powdered, an ounce,
Water three pints;

Boil down to two pints, constantly stirring; then strain.

This mixture contains phosphate of lime, a totally inert substance, suspended in mucilage.

MISTURA CRETÆ.

Mixture of Chalk.

Take of Prepared Chalk half an ounce,
Purified Sugar three drachms,
Gum Arabic, powdered, half an ounce,
Water a pint;

Mix.

Medicinal Use.—Antacid in diarrhœa. Dose, f℥j. to f℥ij. every three or four hours; its utility is increased when it is combined with opium, catechu, or any other astringent. It is of course incompatible with every acid and acidulous salt.

MISTURA FERRI COMPOSITA.

Compound Mixture of Iron.

Take of Myrrh, powdered, a drachm,
Subcarbonate of Potash twenty five grains,
Rose Water seven ounces and a half,
Sulphate of Iron, powdered, a scruple,
Spirit of Nutmeg half a fluidounce,
Purified Sugar a drachm;

Rub together the Myrrh with the Spirit of Nutmeg and the Subcarbonate of Potash, and to these, while rubbing, add first the Rose Water with the Sugar, then the Sulphate of Iron. Put the mixture immediately into a proper glass vessel, and stop it.

Process.—In this preparation double decomposition takes place, precisely as when sulphate of iron is decomposed in preparing the Ferri Subcarbonas; except that, subcarbonate of potash being used in this case, sulphate of potash is formed instead of sulphate of soda.

Qualities.—This preparation contains protocarbonate of iron in a state of suspension. Iron in this form is much more active than when it has become peroxide, and is difficultly soluble. This mixture has at first a greenish colour, but the protocarbonate of iron, to which that is owing, very readily absorbs oxygen from the air, and becomes reddish yellow peroxide, precisely similar to the precipitate formed when water is added to Liquor Ferri Alkalini.

Mistura Ferri Composita should always be prepared at the moment at which it is wanted, for not only is its efficacy diminished by keeping, but, from the different appearances which it presents when recently prepared, to those it exhibits

when long kept, the patient would naturally suppose that some mistake had occurred in preparing it.

Medicinal Uses.—Astringent. Tonic. Dose, f℥i. to f℥ij. two or three times a day. It is especially recommended in hysteria and chlorosis, and is unquestionably one of the most efficacious preparations of iron.

Incompatibles.—Acids and acidulous salts, which dissolve the protocarbonate of iron. Vegetable astringents render it black, and are therefore incompatible with it.

MISTURA GUAIACI.

Mixture of Guaiacum.

Take of Guaiacum Gum Resin a drachm and a half,
Purified Sugar two drachms,
Mucilage of Gum Arabic two fluidrachms,
Cinnamon Water eight fluidounces;

Rub the Guaiacum with the Sugar, then with the Mucilage, and to these, while rubbing, add gradually the Cinnamon Water.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, f℥ss. to f℥ij. two or three times a day.

MISTURA MOSCHI.

Mixture of Musk.

Take of Musk,
Gum Arabic, powdered,
Purified Sugar, of each a drachm,
Rose Water six fluidounces;

Rub the Musk with the Sugar, then with the Gum, the Rose Water being gradually poured in.

Medicinal Use.—Antispasmodic. Dose, f℥i. to f℥ij.

SPIRITS.

Spirit of wine, or alcohol diluted with water, is employed in pharmacy for various important purposes, and of different degrees of strength, according to circumstances. In its concentrated state it is termed *alcohol;* when diluted with a small proportion of water it is called *rectified spirit;* and when more largely diluted, *proof spirit.* The two latter are articles of the Materia Medica, and the former is prepared by the process stated below.

The first preparations in which Spirit is used in the Pharmacopœia, are classed together under the title of *Spiritus;* it includes spirit of ammonia, several aromatic distilled spirits, and a solution of camphor: *Tincturæ* form the second class of preparations; the third are the *Ætherea;* and the last, the *Vina.*

ALCOHOL.

Alcohol.

Take of rectified Spirit a gallon;
Subcarbonate of Potash three pounds;

Put into the Spirit a pound of the Subcarbonate of Potash, previously heated to 300°, and macerate for twenty-four hours, frequently stirring; then add to the Spirit poured off, that which is left of the Subcarbonate of Potash, heated to the same degree; lastly, in a water bath, let the Alcohol distil, which is to be kept in a stopped vessel.

The specific gravity of Alcohol is to the specific gravity of distilled Water, as .815 to 1.000.

Process.—Subcarbonate of potash is a deliquescent salt, and consequently affinity exists between it and water; and

when it is mixed with rectified spirit, the water that the spirit contains is separated from the alcohol, for which it has less affinity than for the subcarbonate of potash.

The compound of water and subcarbonate of potash is totally insoluble in the alcohol, so that a piece of turmeric paper dipped into the latter, does not indicate the presence of any alkali; distillation is however requisite, to separate any saline impurity from the alcohol, which it may have dissolved. The same subcarbonate of potash may be repeatedly used for this purpose, after it has been dried; nor is it deteriorated for general use, when the spirit is of a proper degree of purity.

The strongest spirit which has hitherto been produced is of sp. gr. 0.796, at the temperature of 60°: and it is, probably, alcohol free from water; according to Saussure, it consists nearly of

Hydrogen	13.04	3 atoms	1×3 = 3
Carbon	52.17	or 2 atoms	6×2 =12
Oxygen	34.79	1 atom	= 8
	100.00	Weight of its atom	=23

Qualities.—Alcohol, when pure, is colourless and transparent; its odour is rather pleasant, and its taste is penetrating. It has never been rendered solid by exposure to any degree of cold, either natural or artificial. Alcohol is that part of fermented liquors from which their intoxicating power is derived. It is extremely volatile, producing great cold during its evaporation; and the stronger the alcohol, the greater is the cold produced. It is highly inflammable, and during combustion, water and carbonic acid are generated, the quantity of the former exceeding that of the weight of alcohol burned.

Alcohol of sp. gr, 0.800 boils at 174°, or 38° below the boiling point of water, and it is very expansible by heat. When it is mixed with water, heat is evolved, the capacity of the compound being less than that of its ingredients; and the mixture occupies considerably less space than the water and alcohol do when separate.

Alcohol prevents animal substances which are immersed in it from decay; and hence its use in the preservation of anatomical preparations. Its solvent power is very great, and it is on this account that it is in many cases employed in pharmacy, especially in the preparation of the tinctures of those substances which are resinous, and insoluble in water. It is also largely employed in the preparation of æther.

The following are the proportions of alcohol of sp. gr. 0.796 and water, by weight, in the

	Alcohol, P. L.	Spiritus Rectificatus, P. L.	Spiritus Tenuior, P. L.
Alcohol	93	85	44
Water	7	15	56
	100	100	100

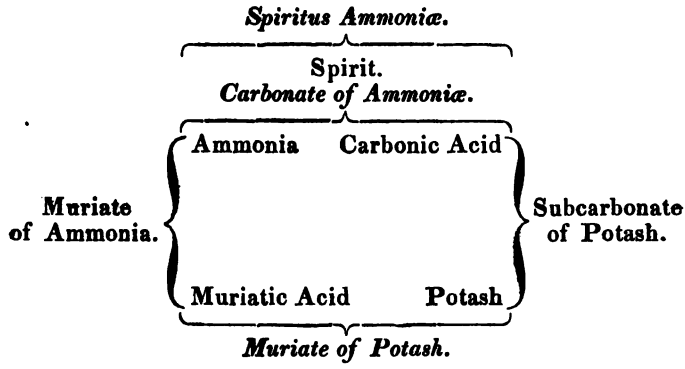
Proof spirit may consequently be prepared by mixing about 100 parts of rectified spirit with 93 of water, both by weight.

SPIRITUS AMMONIÆ.

Spirit of Ammonia.

Take of Proof Spirit three pints,
Muriate of Ammonia four ounces,
Subcarbonate of Potash six ounces;
Mix, and, with a slow fire, let a pint and a half distil into a cooled receiver.

Process.—This is a case of double decomposition; the muriatic acid of the muriate of ammonia combines with the potash of the subcarbonate, and muriate of potash is formed, which remains in solution; the carbonate of ammonia resulting from the union of the carbonic acid and ammonia being a volatile salt, is vaporized with the spirit, and condensed in the receiver.



When muriate of ammonia is decomposed by carbonate of lime, the carbonate of ammonia sublimed, which is the *Ammoniæ Subcarbonas* of the Pharmacopœia, consists of proportions of acid and base, different from those of the carbonate obtained by this process, in which the muriate of ammonia is decomposed by carbonate of potash. The former, I have already stated, is a *sesquicarbonate;* but the latter is a *carbonate,* composed of one atom of each of its constituents, or

Carbonic acid....	56.5	or 1 atom of acid	= 22
Ammonia	43.5	1 atom of base.....	= 17
	100.0	Weight of its atom	= 39

As the carbonate obtained by the agency of carbonate of potash thus contains only two-thirds as much carbonic acid as that procured by the use of carbonate of lime, the greater pungency of Spiritus Ammoniæ than of Liquor Ammoniæ Subcarbonatis, is readily accounted for.

Qualities.—Spirit of Ammonia is a transparent colourless fluid; its smell is pungent and its taste is acrid, and it turns the yellow colour of turmeric brown, indicating its alkaline properties.

Medicinal Uses.—Vide Spiritus Ammoniæ Aromaticus.

Officinal Preparations.—Spiritus Ammoniæ Fœtidus. Spiritus Ammoniæ Aromaticus.

SPIRITUS AMMONIÆ AROMATICUS.

Aromatic Spirit of Ammonia.

Take of Cinnamon Bark, bruised,
Cloves, bruised, of each two drachms,
Lemon Peel four ounces,
Subcarbonate of Potash half a pound,
Muriate of Ammonia five ounces,
Rectified Spirit four pints,
Water a gallon;
Mix, and let six pints distil.

Process.—The chemical products of this operation are similar to those of the last; and although in that, the quantity of subcarbonate of potash is rather too small to decompose the muriate of ammonia, yet in this, the same proportion is directed for the decomposition of one-fourth more.

Qualities.—This preparation resembles the last, but is rendered more agreeable by the aromatics, whether applied to the nostrils or internally exhibited.

Incompatibles.—Acids, acidulous salts, earthy and metallic salts, and lime water.

Officinal Preparations.—Tinctura Guaiaci Ammoniata, Tinctura Valerianæ Ammoniata.

Medicinal Use.—Stimulant in languors and flatulent colic. Dose, f℥ss. to f℥j. in water.

SPIRITUS AMMONIÆ FŒTIDUS.

Fetid Spirit of Ammonia.

Take of Spirit of Ammonia two pints,
Assafœtida two ounces;
Macerate for twelve hours; then with a slow fire let a pint and a half distil into a cooled receiver.

Qualities.—Colourless, pungent, and, as its name expresses, fetid. When long kept it acquires a brownish colour.

Incompatibles.—The same as with the last preparation.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, f ʒ ss to f ʒ j. in water.

SPIRITUS AMMONIÆ SUCCINATUS.

Succinated Spirit of Ammonia.

Take of Mastich three drachms,
Rectified Spirit nine fluidrachms,
Oil of Lavender fourteen minims,
Oil of Amber four minims,
Solution of Ammonia ten fluidounces;

Macerate the Mastich in the Spirit, that it may be dissolved, and pour off the clear tincture; then add the other ingredients, and shake them all together.

Qualities.—This preparation differs from the four preceding in containing ammonia instead of the carbonate. It has a milky appearance, owing to the separation of the mastich from its solution in spirit by the Liquor Ammoniæ. It is commonly called *Eau de Luce*, but no oil of amber is contained in the preparation originally so denominated.

Incompatibles.—Acids; acidulous, metallic, and earthy salts.

Medicinal Uses.—Stimulant and antispasmodic. Dose, ♏ x. to f ʒ ss. in water.

SPIRITUS ANISI.

Spirit of Aniseed.

Take of Aniseed, bruised, half a pound,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant and Carminative in flatulent colic, &c. Dose, f ʒ ij. to f ʒ iv. in water.

SPIRITUS ARMORACIÆ COMPOSITUS.

Compound Spirit of Horse Radish.

Take of fresh Horse Radish Root, sliced,
Dried Orange Peel, each a pound,
Nutmegs, bruised, half an ounce,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant. Dose, f ʒ ij. to f ʒ iv.

SPIRITUS CAMPHORÆ.

Spirit of Camphor.

Take of Camphor four ounces,
Rectified Spirit two pints;
Mix, that the Camphor may be dissolved.

Medicinal Uses.—Stimulant. It is used only externally. It is frequently applied to chilblains, and in cases of chronic rheumatism and numbness.

It is decomposed by water, which, combining with the spirit, precipitates the camphor.

SPIRITUS CARUI.

Spirit of Carraway.

Take of Carraway Seeds, bruised, a pound and a half,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;

Macerate for twenty-four hours; then with a slow fire let a gallon distil.

Medicinal Uses.—Carminative. Stimulant. Dose, f℥ij. to f℥iv.

SPIRITUS CINNAMOMI.

Spirit of Cinnamon.

Take of Oil of Cinnamon, *by weight*, five scruples,
Rectified Spirit four pints and a half;

Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, as much as may be sufficient may remain to prevent empyreuma; then with a slow fire let a gallon distil.

Medicinal Uses.—Stomachic. Stimulant. Dose, f℥ij. to f℥iv.

SPIRITUS COLCHICI AMMONIATUS.

Ammoniated Spirit of Meadow Saffron.

Take of Meadow Saffron Seeds, bruised, two ounces,
Aromatic Spirit of Ammonia a pint;
Macerate for fourteen days and strain.

Medicinal Use.—Diuretic. Dose, f℥ss. to f℥j. in water. The substances enumerated as incompatible with the Spiritus Ammoniæ Aromaticus, are also such with this preparation.

SPIRITUS JUNIPERI COMPOSITUS.

Compound Spirit of Juniper.

Take of Juniper Berries, bruised, a pound,
Carraway Seeds, bruised,
Fennel Seeds, bruised, each an ounce and a half,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant. Diuretic. Dose, f℥iij. to f℥j. It is principally exhibited with other diuretics, as foxglove, &c.

SPIRITUS LAVANDULÆ.

Spirit of Lavender.

Take of fresh Lavender Flowers two pounds,
Rectified Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

Pharmaceutical Uses.—In preparing the Spiritus Lavandulæ Compositus, and Linimentum Camphoræ Compositum.

SPIRITUS LAVANDULÆ COMPOSITUS.

Compound Spirit of Lavender.

Take of Spirit of Lavender three pints,
Spirit of Rosemary a pint,
Cinnamon Bark, bruised,
Nutmegs, bruised, each half an ounce,
Red Saunders Wood, sliced, an ounce;
Macerate for fourteen days and strain.

Qualities.—This preparation belongs rather to the class of Tinctures than of Spirits. It is of a fine red colour, and has an agreeable odour. Its taste is warm and stimulating.

Medicinal Uses.—Stimulant. Stomachic, in languors, &c. Dose, from f℥ss. to f℥ij. in water or any convenient liquid.

SPIRITUS MENTHÆ PIPERITÆ.

Spirit of Peppermint.

Take of Oil of Peppermint, *by weight*, six scruples and a half,
Rectified Spirit four pints and a half;
Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, as much as may be sufficient may remain to prevent empyreuma; then with a slow fire let a gallon distil.

Medicinal Uses.—Stimulant. Carminative. Dose, f℥ij. to f℥j.

SPIRITUS MENTHÆ VIRIDIS.

Spirit of Spearmint.

Take of Oil of Spearmint, *by weight*, six scruples and a half,
Rectified Spirit four pints and a half;
Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, as much as may be sufficient may remain to prevent empyreuma; then with a slow fire let a gallon distil.

This and the three preparations following are employed in similar doses, and with the same intentions as the last.

SPIRITUS MYRISTICÆ.

Spirit of Nutmeg.

Take of Nutmegs, bruised, two ounces,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

SPIRITUS PIMENTÆ.

Spirit of Pimenta.

Take of Pimenta Berries, bruised, two ounces,
Proof Spirit a gallon,
Water as much as may be sufficient to prevent empyreuma;
Macerate for twenty-four hours; then with a slow fire let a gallon distil.

SPIRITUS PULEGII.

Spirit of Pennyroyal.

Take of Oil of Pennyroyal, *by weight*, seven scruples,
Rectified Spirit four pints and a half;
Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, as much as may be sufficient may remain to prevent empyreuma; then with a slow fire let a gallon distil.

SPIRITUS ROSMARINI.

Spirit of Rosemary.

Take of Oil of Rosemary, *by weight*, an ounce,
Rectified Spirit a gallon;
Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, as much as may be sufficient may remain to prevent empyreuma; then with a slow fire let a gallon distil.

This is employed in the following officinal preparations:—Spiritus Lavandulæ Compositus, and Linimentum Saponis Compositum.

TINCTURES.

Tinctures are solutions of various substances in spirit of wine, of different degrees of strength; they are principally prepared from vegetable matters, but in some cases metallic salts are dissolved in it; in others the tinctures contain ammonia, and in one instance, animal matter is dissolved by spirit.

The substances which are best adapted for tinctures are those which are active in small doses, for if large ones should be required, they might be in many cases objectionable, on account of the quantity of spirit necessarily exhibited with them.

Those substances which are imperfectly soluble in water, or totally insoluble in it, or which spoil unless they are preserved by spirit, are proper for tinctures, provided they can be given in sufficiently large doses; opium, digitalis, &c. are bodies of this class.

Tinctures are frequently useful additions to infusions and decoctions, the spirit preventing the decomposition, which

otherwise occurs rapidly. Tinctures which hold resinous matter in solution, such as that of guaiacum, suffer decomposition on the addition of water.

All Tinctures ought to be prepared in stopped glass vessels, and to be frequently shaken during maceration.

TINCTURA ALÖES.

Tincture of Aloes.

Take of the Extract of Spiked Aloe, powdered, half an ounce,
Extract of Liquorice an ounce and a half,
Water a pint,
Rectified Spirit four fluidounces;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, f℥ss. to f℥iss.

TINCTURA ALÖES COMPOSITA.

Compound Tincture of Aloes.

Take of Extract of Spiked Aloe, powdered,
Saffron, each three ounces,
Tincture of Myrrh two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, f℥j. to f℥ij.

TINCTURA ASSAFŒTIDÆ.

Tincture of Assafœtida.

Take of Assafœtida four ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, f℥ss. to f℥iss. This tincture is rendered turbid when mixed with water, owing to the precipitation of the resinous matter of the assafœtida.

TINCTURA AURANTII.

Tincture of Orange (Peel.)

Take of fresh Orange Peel three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥ij. to f℥iij. It is a useful adjunct to bitter infusions and decoctions.

TINCTURA BENZÖINI COMPOSITA.

Compound Tincture of Benzoin.

Take of Benzoin three ounces,
Storax Balsam, strained, two ounces,
Balsam of Tolu an ounce,
Extract of spiked Aloe half an ounce,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Expectorant. Dose, f℥ss. to f℥ij. In chronic catarrh and confirmed asthma. It is decomposed by water, resinous matter being precipitated, and must therefore be triturated with yolk of egg, or with mucilage. It is more employed externally than internally, as a stimulant to languid ulcers; but its application to fresh wounds, for which it is mostly employed under the name of *Friar's Balsam*, appears to be injurious, by preventing the wound from healing by the first intention.

TINCTURA CALUMBÆ.

Tincture of Calumba.

Take of Calumba, sliced, two ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij.

TINCTURA CAMPHORÆ COMPOSITA.

Compound Tincture of Camphor.

Take of Camphor two scruples,
Hard Opium, powdered,
Benzoic Acid, each a drachm,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Anodyne. Dose, f℥j. to f℥iij. A fluid-ounce contains nearly two grains of opium.

TINCTURA CANTHARIDIS.

Tincture of Cantharides.

Take of Cantharides, bruised, three drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Stimulant. Dose, ♏ x to f ʒ j. given in some demulcent infusion. It is useful in gleets, fluor albus, and incontinence of urine. It is likewise employed externally as a stimulating embrocation or rubefacient, in conjunction with camphor liniment, &c.

TINCTURA CAPSICI.

Tincture of Capsicum.

Take of Capsicum Berries, an ounce,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Stimulant. Dose, ♏ x to f ʒ j. It is employed in the low stage of typhus, and similar cases.

TINCTURA CARDOMOMI.

Tincture of Cardamom.

Take of Cardamom Seeds, bruised, three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Carminative. Dose f ʒ j. to f ʒ ij. It is generally employed as an adjunct to bitter infusions, but less frequently than the following.

TINCTURA CARDAMOMI COMPOSITA.

Compound Tincture of Cardamom.

Take of Cardamom Seeds,
Carraway Seeds,
Cochineal, each, powdered, two drachms,
Cinnamon Bark, bruised, half an ounce,
Raisins, stoned, four ounces,
Proof Spirit, two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—As the former, and in similar doses.

TINCTURA CASCARILLÆ.

Tincture of Cascarilla.

Take of Cascarilla Bark, powdered, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f ʒ j. to f ʒ ij.

TINCTURA CASTOREI.

Tincture of Castor.

Take of Castor, powdered, two ounces,
Rectified Spirit two pints;
Macerate for seven days, and strain.

Medicinal Uses.—Antispasmodic. Stimulant. Dose, ♏ xx. to ʒij.

TINCTURA CATECHU.

Tincture of Catechu.

Take of Extract of Catechu three ounces,
Cinnamon Bark, bruised, two ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Astringent. Dose, ʒj. to ʒiij. It is a very useful and grateful adjunct to Mistura Cretæ in diarrhœa.

TINCTURA CINCHONÆ.

Tincture of Cinchona.

Take of lance-leaved Cinchona Bark, (pale Bark) powdered, seven ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij. It is principally used in mixtures, with the Infusion or Decoction of Bark.

TINCTURA CINCHONÆ AMMONIATA.

Ammoniated Tincture of Cinchona.

Take of lance-leaved Cinchona Bark, (pale Bark) powdered, four ounces,
Aromatic Spirit of Ammonia two pints;
Macerate for ten days, and strain.

Medicinal Uses.—Tonic. Stimulant. Dose, f℥ss. to f℥ij. it is, of course, incompatible with acids; and with acidulous, earthy, and metallic salts.

TINCTURA CINCHONÆ COMPOSITA.

Compound Tincture of Cinchona.

Take of lance-leaved Cinchona Bark, (pale Bark) powdered, two ounces,
Orange Peel, dried, an ounce and a half,
Serpentary Root, bruised, three drachms,
Saffron a drachm,
Cochineal, powdered, two scruples,
Proof Spirit twenty fluidounces;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, f℥j. to f℥iij. It contains considerably less cinchona than the simple tincture, but is rendered more grateful by the admixture of the bitters and aromatics.

TINCTURA CINNAMOMI.

Tincture of Cinnamon.

Take of Cinnamon Bark, bruised, three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

TINCTURA CINNAMOMI COMPOSITA.

Compound Tincture of Cinnamon.

Take of Cinnamon Bark, bruised, six drachms,
Cardamom Seeds, bruised, three drachms,
Long Pepper, powdered,
Ginger Root, sliced, each two drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—This and the former are both stomachic and astringent. Dose, f℥j. to f℥ij.

TINCTURA DIGITALIS.

Tincture of Foxglove.

Take of Foxglove Leaves, dried, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Sedative. Dose, ♏x. to ♏xl. gradually increased. If it occasion vomitting or purging, its diuretic powers will be lost, which may be prevented by the use of a small quantity of opium.

TINCTURA GENTIANÆ COMPOSITA.

Compound Tincture of Gentian.

Take of Gentian Root, sliced, two ounces,
Orange Peel, dried, an ounce,
Cardamom Seeds, bruised, half an ounce,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Stomachic. Dose, fʒj. to fʒij. It is most advantageously exhibited in combination with the Infusum Gentianæ compositum.

TINCTURA GUAIACI.

Tincture of Guaiacum.

Take of Guaiacum Gum Resin, powdered, half a pound,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, fʒj. to fʒiij. When mixed with water the guaiacum is precipitated; it should therefore be exhibited in mixture with some mucilage, or with yolk of egg.

TINCTURA GUAIACI AMMONIATA.

Ammoniated Tincture of Guaiacum.

Take of Guaiacum Gum Resin, powdered, four ounces,
Aromatic Spirit of Ammonia a pint and a half;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Diaphoretic. Dose, f℥ss. to f℥ij. This is a more powerful preparation than the simple tincture, on account of the presence of ammonia. Like the simple tincture it is decomposed by water, and must therefore be exhibited with similar precautions.

For incompatible substances, vide Tinctura Cinchonæ Ammoniata.

TINCTURA HELLEBORI NIGRI.

Tincture of Black Hellebore.

Take of Black Hellebore Root, cut, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Emmenagogue. Dose, ♏ xxx. to f℥j.

TINCTURA HUMULI.

Tincture of Hops.

Take of Hops five ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Sedative. Tonic. Dose, from f℥ss. to f℥ij. Its powers are questionable.

TINCTURA HYOSCYAMI.

Tincture of Henbane.

Take of Henbane Leaves, dried, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Narcotic. Dose, f℥ss. to f℥ij. It is stated to procure sleep without affecting the head, or producing the costiveness which opium is apt to do.

TINCTURA JALAPÆ.

Tincture of Jalap.

Take of Jalap Root, powdered, eight ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Cathartic. Dose, f℥j. to f℥ss. It is an efficient medicine, but is rarely administered except as an adjuvant to cathartic combinations.

TINCTURA KINO.

Tincture of Kino.

Take of Kino, powdered, three ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Astringent. Dose, f℥j. to f℥ij. It consists chiefly of tannin, and is said to be less efficacious than the Tinctura Catechu.

TINCTURA MYRRHÆ.

Tincture of Myrrh.

Take of Myrrh, bruised, four ounces,
Rectified Spirit three pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Deobstruent. Dose, f℥ss. to f℥j. It is, however, rarely used internally; but as an external application to foul ulcers, and when diluted with water as a lotion for spongy gums. It is decomposed, and its resin precipitated, by mixture with water.

TINCTURA OPII.

Tincture of Opium.

Take of Hard Opium, powdered, two ounces and a half,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Qualities.—This tincture is of a deep brownish red colour, and possesses the peculiar odour and taste of the opium itself. Its specific gravity I find to be 0.952, when prepared with proof spirit of sp. gr. 0.930, as directed in the Pharmacopœia; about 19 minims contain one grain of opium; this was proved by boiling down the tincture, and also by determining the quantity of opium left undissolved. It will appear from what has already been stated, that proof spirit is a much better solvent of opium than cold water; for the latter dissolves less than 3-7ths of the opium, whereas proof

spirit, as I found in preparing the tincture, dissolves more than 2-3rds of it.

Incompatibles.—This tincture is decomposed by ammonia, potash, and soda, and their subcarbonates, morphia being precipitated; most metallic salts, and infusion of galls, also decompose it.

Medicinal Use.—Narcotic. As 19 minims contain one grain of opium, the quantity exhibited must depend upon that of the opium which it is intended to give. Its dose is generally stated to be from ♏ x. to ♏ lx. It is given in preference to opium in substance, in cases of accident or of sudden and extreme pain; it is sometimes preferred to solid opium in chronic cases, on account of the facility with which the dose may be apportioned and varied according to circumstances. It is externally employed as an anodyne in lotions.

TINCTURA RHEI.

Tincture of Rhubarb.

Take of Rhubarb Root, sliced, two ounces,
Cardamom Seeds, bruised, half an ounce,
Saffron two drachms,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Purgative. Stomachic. Dose, ʒij. to ʒ̄iss.

TINCTURA RHEI COMPOSITA.

Compound Tincture of Rhubarb.

Take of Rhubarb Root, sliced, two ounces,
Liquorice Root, bruised, half an ounce,
Ginger Root, sliced,
Saffron, each two drachms,
Proof Spirit a pint,
Water twelve fluidounces;
Macerate for fourteen days, and strain.

Medicinal Uses as the former, and in similar doses.

TINCTURA SCILLÆ.

Tincture of Squills.

Take of Squill Root, fresh dried, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Expectorant. Diuretic. Dose, ♏ x. to ♏ xxx.

TINCTURA SENNÆ.

Tincture of Senna.

Take of Senna Leaves three ounces,
Carraway Seeds, bruised, three drachms,
Cardamom Seeds, bruised, a drachm,
Raisins, stoned, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stomachic and purgative. Dose, f℥ij. to f℥j.

TINCTURA SERPENTARIÆ.

Tincture of Serpentary.

Take of Serpentary Root three ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Tonic. Diaphoretic. Dose, f℥i. to f℥iij.

TINCTURA VALERIANÆ.

Tincture of Valerian.

Take of Valerian Root four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Antispasmodic. Dose, from f℥i. to f℥iij. It is seldom employed except as an adjunct to the infusion of valerian.

TINCTURA VALERIANÆ AMMONIATA.

Ammoniated Tincture of Valerian.

Take of Valerian Root four ounces,
Aromatic Spirit of Ammonia two pints;
Macerate for fourteen days, and strain.

Medicinal Use.—Antispasmodic. Dose, f℥i. to f℥ij. It is more powerful than the simple tincture, only on account of the ammonia which it contains. It is incompatible with acids, and with acidulous, metallic, and earthy salts.

TINCTURA ZINGIBERIS.

Tincture of Ginger.

Take of Ginger Root, sliced, two ounces,
Rectified Spirit two pints;
Macerate for fourteen days, and strain.

Medicinal Uses.—Stimulant. Carminative. Dose, f℥i. to f℥ij. It is useful in gout when it attacks the stomach, and in flatulent colic, and as a corrigent to griping purgatives.

PREPARATIONS OF ÆTHER.

ÆTHER SULPHURICUS.

Sulphuric Æther.

Take of Rectified Spirit,
Sulphuric Acid, each, *by weight*, a pound and a half;

Pour the Spirit into a glass retort, and add to it the Acid gradually, frequently shaking them, and taking care that the heat does not exceed 120°, until they are mixed. Afterwards place [the retort] cautiously in sand, first heated to 200°, that the liquor may boil as quickly

as possible, and the Æther pass into a tubulated receiver, to which a receiving vessel is fitted cooled by ice or water. Let the liquor distil, until some heavier part begins to pass over, which may be seen under the Æther at the bottom of the receiver. To the liquor which remains in the retort, again pour twelve ounces of rectified Spirit, that Æther may distil in the same manner.

Process.—In preparing the Æther Sulphuricus, I obtained, by using the proportions directed, f℥ 12 of product, f℥ 6 of which were the *heavier part* mentioned, and f℥ 11¼ æther sulphuricus of sp. gr. 0.768. On adding the second portion of spirit, the quantity of æthereal product was nearly similar, but its sp. gr. was 0.807 instead of 0.768, showing that the power of the acid in producing æther was much diminished by the first operation.

It has been already stated (p. 189), that 46 parts or two atoms of pure Spirit or Alcohol, are composed of

6 atoms of Hydrogen.....1×6= 6
4 atoms of Carbon .....6×4=24
2 atoms of Oxygen .....8×2=16

Weight of two atoms=46

It appears from the experiments of Dalton and other chemists, that æther is composed of

5 atoms of Hydrogen.....1×5= 5
4 atoms of Carbon .....6×4=24
1 atom of Oxygen 8

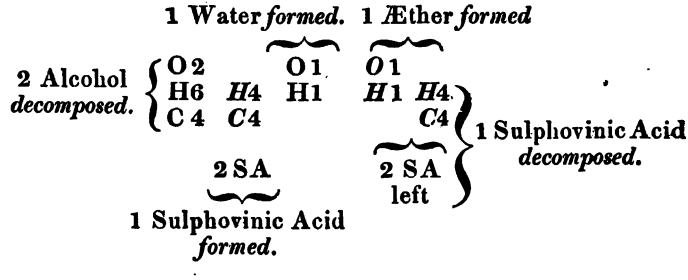
Weight of its atom=37

If, then, we subtract 37, the atomic weight of the æther, from 46, the weight of two atoms of alcohol, there remain 9, representing an atom of oxygen 8, and an atom of hydrogen 1; it follows, therefore, that during the conversion of the alcohol into æther, the sulphuric acid detaches oxygen and hydrogen from the former, equivalent to an atom of water, while the remaining constituents of the alcohol combine to form æther. It was once supposed that the only effect necessary to be produced for the formation of æther, was that of separating oxygen and hydrogen from the alcohol, as above described. And although this is probably the final result, it appears that more complicated changes occur; and

it has been stated by several chemists that the sulphuric acid undergoes great change of properties, and is converted into a peculiar acid called the sulphovinic. Mr. Hennel, who has recently investigated the subject, has shown, that sulphuric acid suffers great loss of saturating power as soon as it is mixed with alcohol, owing to the immediate formation of sulphovinic acid; this results from the union of more than half of the sulphuric acid, with a part of the hydrogen and carbon of the alcohol, and the newly formed acid appears to consist of

4 atoms of Hydrogen	1×4= 4
4 atoms of Carbon	6×4=24
2 atoms of Sulphuric Acid.....	40×2=80
	Weight of its atom=108

When, however, this mixture of alcohol, sulphuric acid, and sulphovinic acid is subjected to distillation, the sulphovinic acid is decomposed and æther is produced; it results also from the experiments of Mr. Hennel, that æther is not formed by the direct abstraction of the elements of water from the alcohol by the sulphuric acid, but that the formation of sulphovinic acid is a necessary and intermediate step to the production of the æther. After the distillation is over, the sulphuric acid is found in the residue in its original state, and scarcely diminished in quantity; it seems then that when the sulphovinic acid formed by mere mixture, is decomposed during distillation, the 4 atoms of hydrogen and 4 atoms of carbon which it contains, take half the hydrogen and oxygen with which they formed alcohol, and by thus uniting with another atom of hydrogen and an atom of oxygen, they form æther, while the remaining atom of hydrogen and oxygen form an atom of water. This gives its constitution as above stated, and the series of changes is represented in the annexed diagram, in which oxygen, hydrogen, and carbon, are represented by their initials, sulphuric acid by SA, and the number of atoms by figures.



Sulphovinic acid combines with the alkalies forming salts, which are called sulphovinates. When the sulphovinate of potash is heated with sulphuric acid, the small quantity of water which the salt and acid contain only being present, a portion of the water or its elements unite with the hydrogen and carbon of the sulphovinic acid, and æther results from their combination; but if the quantity of water be larger, then the hydrogen and carbon combine with a double quantity of it or of its constituents, and the product is alcohol instead of æther. It appears, then, that æther or alcohol may be formed from sulphovinate of potash, without the presence of any alcohol.

ÆTHER RECTIFICATUS.

Rectified Æther.

Take of Sulphuric Æther fourteen fluidounces,
Fused Potash half an ounce,
Distilled Water eleven fluidounces;

First dissolve the Potash in two fluidounces of the Water, and add the Æther to it, shaking them continually until they are mixed; then, at a heat of about 120°, let twelve fluidounces of Æther distil from a large retort into a cooled vessel; shake the distilled [product] with nine fluidounces of the Water, and set them by, that the Water may subside. Lastly, pour off the supernatant rectified Æther, and keep it in a vessel well stopped.

Process.—The process for procuring Æther Sulphuricus is only a part of that for obtaining Æther Rectificatus, and the products chiefly differ in the former containing alcohol, water, and sulphurous acid. These are intended to be separated by the action of the potash in the process for obtaining Æther Rectificatus, but it is better to use the *Potassa Fusa*, without any water. When this is put into Æther Sulphuricus, the water, and a large portion of the alcohol, having great

affinity for it, readily dissolve it; and the Æther floats on the solution, not having any affinity for the alkali.

Qualities.—Sulphuric Æther, the Æther Rectificatus of the Pharmacopœia, is a transparent colourless fluid; its smell is pleasant and its taste pungent. It is extremely volatile, and during evaporation it occasions a great degree of cold. Under the usual atmospheric pressure, æther of sp. gr. 0.713 boils at 94°, and *in vacuo* at a temperature much below that of freezing water. For medicinal purposes its sp. gr. should be at most 0.750, and even then it contains some alcohol, and it may be procured of sp. gr. 0.700. It is highly inflammable, so that its vapour readily takes fire on the approach of flame. It unites with alcohol in all proportions, but combines sparingly with water.

Officinal Preparations.—Spiritus Ætheris Sulphurici, Spiritus Ætheris Sulphurici Compositus.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, ʒss. to ʒij. On account of the cold which it produces during evaporation, it is a useful refrigerant applied to scalds and burns.

OLEUM ÆTHEREUM.

Æthereal Oil.

After the distillation of Sulphuric Æther, the heat being lowered, let the liquor again distil, until a black froth swells up; then immediately remove the retort from the fire. Add Water to the liquor which remains in the retort, that the oily part may float. Take away this, and mix with it as much Lime Water as may be sufficient to saturate the acid which is in it, and shake them together. Lastly, remove the separated Æthereal Oil.

Process.—Oil of wine may be procured more plentifully by distilling equal measures of sulphuric acid and spirit than by the above process; the product, after treatment with a weak solution of subcarbonate of potash, has a fragrant

smell and a bitterish pungent flavour; its specific gravity is 1060, and it is very volatile and inflammable.

Composition.—According to Mr. Hennel, oil of wine consists of sulphuric acid combined with twice as much hydrogen and carbon as in sulphovinic acid, and when half their quantity is abstracted, sulphovinic acid is actually procured.

Officinal Preparation.—Spiritus Ætheris Sulphurici Compositus.

SPIRITUS ÆTHERIS AROMATICUS.

Aromatic Spirit of Æther.

Take of Cinnamon Bark, bruised, three drachms,
Cardamom Seeds, powdered, a drachm and a half,
Long Pepper, powdered,
Ginger Root, sliced, each a drachm,
Spirit of Sulphuric Æther a pint;

Macerate for fourteen days, in a stopped glass vessel, and strain.

Medicinal Uses.—Stimulant. Antispasmodic. Dose, f℥ss. to f℥i.

SPIRITUS ÆTHERIS NITRICI.

Spirit of Nitric Æther.

Take of Rectified Spirit two pints,
Nitric Acid, *by weight*, three ounces;

Add the Acid to the Spirit gradually, and mix, taking care that the heat does not exceed 120°; then, with a gentle heat, let twenty-four fluidounces distil.

Process.—When a mixture of alcohol and nitric acid is subjected to distillation, a portion of each is decomposed,

and nitric æther is formed by the re-union of their elements; this rises in vapour with the undecomposed alcohol, and these, when condensed together, constitute the Spiritus Ætheris Nitrici.

The exact nature and composition of nitric æther have not been satisfactorily ascertained; no doubt, however, exists of its being formed of a portion of each of the elements of the acid and spirit; the former consisting of oxygen and azote, and the latter of oxygen, hydrogen, and carbon.

M. Thenard states its composition to be as follows:—

Oxygen	48.52
Hydrogen	8.54
Azote	14.49
Carbon	28.45
	100.00

It is to be remembered, that the preparation directed in the Pharmacopœia, is a mixture of nitric æther and alcohol, in proportions which have not been determined.

Qualities.—This preparation is colourless, has a peculiar and rather fragrant æthereal odour; its taste is pungent and slightly acid. It is very inflammable, but not so much so as sulphuric æther; and being also less volatile, it does not occasion so great a degree of cold during evaporation. The specific gravity of Spiritus Ætheris Nitrici should not exceed 0.834; but when the distillation is carried on too far, the product is specifically heavier, high coloured, of a much less agreeable odour, and very acid.

Adulteration.—If the specific gravity exceeds 0.834, the excess may arise from the presence of water, or of nitric acid, or from a mixture of them. If the acid be present in considerable quantity, it may be detected by the taste, by its acting strongly upon litmus paper, or by the effervescence of carbonic acid, when a crystal of subcarbonate of soda is dropped into it.

Medicinal Uses.—Refrigerant. Diuretic. Dose, ♏ x. to ♏ xl.

SPIRITUS ÆTHERIS SULPHURICI.

Spirit of Sulphuric Æther.

Take of Rectified Æther half a pint,
Rectified Spirit a pint;
Mix.

Medicinal Uses.—Similar to those of Æther Rectificatus. Dose, f℥i. to f℥iij. It is rendered weaker than æther rectificatus, by the large quantity of rectified spirit with which it is diluted.

The specific gravity of this preparation I find to be about 0.816, when the æther and spirit which enter into its composition are of the proper quality.

SPIRITUS ÆTHERIS SULPHURICI COMPOSITUS.

Compound Spirit of Sulphuric Æther.

Take of Spirit of Sulphuric Æther a pint,
Æthereal Oil two fluidrachms;
Mix.

Medicinal Uses.—Similar to those of the last preparation, and in the same doses.

WINES.

It has already been mentioned that the College have now substituted dilute spirit for wine, in all those preparations which were formerly, and indeed are even now, termed *Vina.* This change has been decidedly disadvantageous with respect to Vinum Ferri; but whether any alteration of power or properties are induced in the other vinous preparations, I

have not had an opportunity of determining, but I think this must be the case; for the following statement will show, that instead of using wine of an uniform degree of strength, dilute spirit of very different qualities is employed.

	Proof Spirit.		Water.
Vinum Ferri	1 part	....	1½ parts
——— Aloës	1 do.	....	1 do.
——— Colchici	1 do.	....	2 do.
——— Ipecacuanhæ ..	1 do.	....	1⅔ do.
——— Opii	1 do.	....	1⅔ do.
——— Veratri	1 do.	....	1½ do.

I am clearly of opinion that the above proportions are not the most proper which could have been selected, and it appears to me that the preparations must possess different powers from those which they formerly had.

VINUM ALÖES.

Wine of Aloes.

Take of Extract of spiked Aloe eight ounces,
Canella Bark two ounces,
Proof Spirit,
Distilled Water, each four pints;

Rub the Aloes to powder, with white sand freed from impurities; rub also the Canella Bark to powder; and to these, mixed together, pour the Spirit and the Water. Macerate for fourteen days, frequently shaking, and strain.

Medicinal Uses.—Stomachic, in doses of ʒi. to ʒij. Purgative, ℥i. to ℥ij.

VINUM COLCHICI.

Wine of Meadow Saffron.

Take of fresh Meadow Saffron Root, sliced, a pound,
Proof Spirit four fluidounces,
Distilled Water eight fluidounces;

Macerate for fourteen days, and strain.

Medicinal Uses.—Diuretic. Dose, from ♏ xxx. to ʒi. It is stated to be a specific in the gout, allaying the pain, and cutting short the paroxysm. On account of the weakness of the spirit, this preparation is extremely liable to spoil.

Meadow saffron is a well known poisonous plant; its power resides in a peculiar vegetable alkali, which is similar to that occurring in white hellebore, and termed *veratria.*—*Vide* Vinum Veratri.

VINUM IPECACUANHÆ.

Wine of Ipecacuanha.

Take of Ipecacuanha Root, bruised, two ounces,
Proof Spirit twelve fluidounces,
Distilled Water twenty fluidounces;
Macerate for fourteen days, and strain.

Medicinal Uses.—Diaphoretic. Dose, ♏ xx. to ♏ xl. Emetic. Dose, fʒij. to fʒiv. It is as efficacious an emetic as Vinum Antimonii Tartarizati, and, being milder in its operation, is better adapted for infants, a tea-spoonful or fʒss. being administered every ten or fifteen minutes till it operates.

The active property of ipecacuanha is a peculiar substance, to which the name of *Emetin* has been given. The root contains 14 per cent. of it, mixed with woody fibre, starch, gum, &c. Dr. A. T. Thomson (Dispensatory, p. 817) states, that a pint of sherry takes up 100 grains of the soluble matter of ipecacuanha; but the quantity dissolved by the spirit now ordered has not, that I know of, been ascertained; as, however, it contains at least twice as much alcohol as the wine formerly directed to be used, the present preparation may be considerably stronger, unless the wine dissolved the whole of the emetin contained in the root, for this principle is insoluble in water, but soluble in alcohol, and probably in a greater degree when it is strong than dilute. On the other hand, emetin is soluble in acids, and the presence of a small quantity of acetic acid and of bitartrate of potash in the wine, may counterbalance the deficiency of strength in its

alcohol. Emetin is insoluble in æther, but is dissolved by most acids. The solutions are not decomposed by tartarized antimony, but they are incompatible with salts of lead and mercury, and infusion of galls.

According to the analysis of M. M. Dumas and Pelletier, emetin consists of

Carbon	64.57
Azote	4.30
Hydrogen	7.77
Oxygen	22.95
	99.59

VINUM OPII.

Wine of Opium.

Take of Extract of Opium an ounce,
Cinnamon Bark, bruised,
Cloves, bruised, each a drachm,
Proof Spirit six fluidounces,
Distilled Water ten fluidounces;
Macerate for eight days, and strain.

Medicinal Use.—Narcotic. Dose, ♏ x. to ʒi.

This preparation differs from the Tinctura Opii, not only in containing aromatics, but in some other respects. The spirit of the Vinum Opii is weaker than that of the tincture in the proportion of six to sixteen: the opium is purified, and only four-fifths of the quantity of that contained in the tincture. Various circumstances render it difficult to form an estimate of the comparative powers of these preparations; they probably differ but little, for respectable authorities agree in representing their doses as similar. The Vinum Opii (or rather the compound tincture of opium) must be less disagreeable to most persons than the tincture, not only on account of the aromatics which it contains, but because the opium during purification loses its peculiar and disagreeable smell and taste.

VINUM VERATRI.

Wine of White Hellebore.

Take of White Hellebore Root, sliced, eight ounces,
Proof Spirit a pint,
Distilled Water a pint and a half;
Macerate for fourteen days, and strain.

Medicinal Uses.—Emetic and cathartic, acting usually with considerable violence. Dose, ♏ v. to ♏ x.

The peculiar and poisonous quality of hellebore is an alkaline body, which is called *Veratria*, and which I have already stated exists in meadow saffron.

For the method of preparing it, I refer to Dr. Henry's Elements of Chemistry, and he gives nearly the following account of its properties:—It is white, pulverulent, and destitute of smell; but when inhaled into the nostrils, it produces violent and dangerous sneezing, even when the quantity is too small to be weighed. Its taste is acrid in the highest degree, but without any bitterness. In very minute quantity it produces dreadful sickness and vomiting, and a few grains would probably prove fatal.

It is very slightly soluble in water; when boiling, it takes up only 1-1000th of its weight, but this gives it an acrid taste. It is very soluble in alcohol. It possesses the alkaline properties of restoring the blue colour of reddened litmus paper, and saturates acids, forming salts with them which do not crystallize, and the elements of which are so weakly combined as to be separated by the action of water: it exists in the root combined with gallic acid, forming gallate of veratria.

M. M. Dumas and Pelletier state its composition to be as follows:—

Carbon	66.75
Azote	5.04
Hydrogen	8.54
Oxygen	19.60
	99.93

PREPARATIONS OF VINEGAR.

ACETUM COLCHICI.

Vinegar of Meadow Saffron.

Take of fresh Meadow Saffron Root, sliced, an ounce,
Diluted Acetic Acid a pint,
Proof Spirit a fluidounce;

Macerate the Meadow Saffron Root with the Acid in a close glass vessel for three days; afterwards press out [the liquor] and set it by, that the dregs may subside; lastly, add the Spirit to the clear liquor.

Medicinal Uses.—Diuretic. Dose, f℥ss. to f℥i. in any bland fluid. Like the Vinum Colchici, it is employed in the gout.

ACETUM SCILLÆ.

Vinegar of Squill.

Take of Squill Root, fresh dried, a pound,
Diluted Acetic Acid six pints,
Proof Spirit half a pint;

Macerate the Squill Root with the Acid with a gentle heat, in a close glass vessel, for twenty-four hours; afterwards press out [the liquor] and set it by, that the dregs may subside; lastly, add the Spirit to the clear liquor.

Medicinal Uses.—Expectorant and diuretic. Dose, f℥ss. to f℥ij. in any aromatic distilled water.

It is to be remembered, that alkalies and their carbonates are incompatible with this and the last preparation.

PREPARATIONS OF HONEY.

MEL DESPUMATUM.

Clarified Honey.

Liquefy the Honey in a water bath; then take off the scum.

Honey which has undergone this process is less agreeable to the smell and taste than crude honey. It is said not to ferment so readily, and to be less apt to gripe. It is seldom used except in officinal preparations.

MEL BORACIS.

Honey of Borax.

Take of Subborate of Soda, powdered, a drachm,
Clarified Honey an ounce;
Mix.

Medicinal Uses.—Detergent and cooling in aphthous affections of the tongue and fauces.

MEL ROSÆ.

Honey of Rose.

Take of Red Rose Petals, dried, four ounces,
Boiling Water three pints,
Clarified Honey five pounds;

Macerate the Rose Petals in the Water for six hours, and strain; then add the Honey to the strained liquor, and, in a water bath, boil down to a proper consistence.

Medicinal Use.—As an adjunct to detergent and astringent gargles.

OXYMEL SIMPLEX.

Simple Oxymel.

Take of Clarified Honey two pounds,
Diluted Acetic Acid one pint;

Boil down in a glass vessel, with a slow fire, to a proper consistence.

Medicinal Uses.—Detergent; principally used as the basis of gargles and expectorant remedies. Dose, f℥i. to f℥i.

OXYMEL SCILLÆ.

Oxymel of Squill.

Take of Clarified Honey three pounds,
Vinegar of Squill two pints;

Boil down in a glass vessel, with a slow fire, to a proper consistence.

Medicinal Use.—Expectorant. Dose, f℥ss. to f℥ij. in chronic coughs. In large doses it is emetic.

SYRUPS.

Syrups are strong solutions of sugar in water, generally coloured or flavoured with vegetable matter; and sometimes, but more rarely, they are active medicines; it is particularly requisite that they should be kept in a cool place, or otherwise acetic acid will be generated by fermentation, and this may interfere with medicine, the virtues of which it is employed to increase, or whose disagreeable flavour it is intended to disguise.

Syrups are to be kept in a place where the heat never exceeds 55°.

SYRUPUS ALTHÆÆ.

Syrup of Marshmallow.

Take of fresh Marshmallow Root, bruised, half a pound,
Purified Sugar two pounds,
Water four pints;

Boil down the Water with the Marshmallow Root to half, and press out the cooled liquor. Set it by for twenty-four hours, that the dregs may subside; then pour

off the liquor, and, the Sugar being added, boil down to a proper consistence.

This syrup contains the mucilaginous matter of the marsh-mallow, and is used as a demulcent. It is apt to spoil by fermentation, and does not possess any active property.

SYRUPUS AURANTIORUM.

Syrup of Oranges.

Take of fresh Orange Peel two ounces,
Boiling Water a pint,
Purified Sugar three pounds;
Macerate the Orange Peel in the Water for twelve hours in a vessel lightly covered; then pour off the liquor, and add the Sugar to it.

This syrup is employed merely on account of its grateful aromatic flavour.

SYRUPUS CROCI.

Syrup of Saffron.

Take of Saffron an ounce,
Boiling Water a pint,
Purified Sugar two pounds and a half;
Macerate the Saffron in the Water for twelve hours in a vessel lightly covered; afterwards strain the liquor, and add the Sugar.

It is used merely on account of its fine colour.

SYRUPUS LIMONUM.

Syrup of Lemons.

Take of Lemon Juice, strained, a pint,
Purified Sugar two pounds;
Dissolve the Sugar in the Lemon Juice in the same manner as directed for simple Syrup.

This is a pleasant syrup; but it must be remembered, that its acidity prevents its being employed in any composition that contains alkalies, alkaline earths, or their carbonates.

SYRUPUS MORI.

Syrup of Mulberry.

Take of Mulberry Juice, strained, a pint,
Purified Sugar two pounds;
Dissolve the Sugar in the Mulberry Juice, in the same manner as directed for simple Syrup.

This is used for the same purposes as the former, and it has the advantage of a fine colour.

SYRUPUS PAPAVERIS.

Syrup of Poppy.

Take of Capsules of [white] Poppy, dried and bruised, the seeds being taken away, fourteen ounces,
Purified Sugar two pounds,
Boiling Water two gallons and a half;

Macerate the Capsules in the Water for twenty-four hours; then, in a water bath, boil down to a gallon, and press strongly. Boil down the strained liquor again to two pints, and strain while hot. Set it by for twelve hours, that the dregs may subside; then boil down the clear liquor to a pint, and add the Sugar in the same manner as directed for simple Syrup.

Medicinal Uses.—Anodyne. Narcotic. Dose, f℥j. to f℥j. This syrup is very apt to ferment, and hence the necessity of keeping it cool. It is principally used for children.

SYRUPUS RHAMNI.

Syrup of Buckthorn.

Take of the fresh Juice of Buckthorn Berries four pints,
Ginger Root, sliced,
Pimenta Berries, powdered, each half an ounce,
Purified Sugar three pounds and a half;

Set by the Juice for three days, that the dregs may subside, and strain. To a pint of the clear Juice add the Ginger Root and Pimenta Berries; then macerate with a gentle heat for four hours, and strain; boil down that which is left to the measure of a pint and a half; mix the liquors; and add the Sugar in the same manner as directed for simple Syrup.

Medicinal Use.—Cathartic. Dose, f℥ss. to f℥j. It is an unpleasant remedy both to the taste and in its operation, and is but little used.

SYRUPUS RHŒADOS.

Syrup of Red Poppy.

Take of fresh Red Poppy Petals a pound,
Boiling Water a pint and two fluidounces,
Purified Sugar two pounds and a half;

Add the Petals of the Red Poppy gradually to the Water, heated in a water bath, frequently stirring them; the vessel being removed, macerate for twelve hours; afterwards press out the liquor, and set it by, that the dregs may subside; lastly, add the Sugar in the same manner as directed for simple Syrup.

This syrup is of a fine red colour, and is used only on that account.

SYRUPUS ROSÆ.

Syrup of Rose.

Take of Damask Rose Petals, dried, seven ounces,
Purified Sugar six pounds,
Boiling Water four pints;

Macerate the Rose Petals in the Water for twelve hours, and strain; evaporate the strained liquor in a water bath to two pints and a half; afterwards add the Sugar in the same manner as directed for simple Syrup.

Medicinal Properties.—Purgative, but weakly so; it is sometimes given to infants. Dose, ʒij. to ʒj.

SYRUPUS SARSAPARILLÆ.

Syrup of Sarsaparilla.

Take of Sarsaparilla Root, sliced, a pound,
Boiling Water a gallon,
Purified Sugar a pound;

Macerate the Root in the Water for twenty-four hours; then boil down to four pints, and strain the liquor while hot; afterwards add the Sugar, and evaporate to a proper consistence.

This is employed as an adjunct to the decoction of Sarsaparilla.

SYRUPUS SENNÆ.

Syrup of Senna.

Take of Senna Leaves two ounces,
Fennel Seeds, bruised, an ounce,
Manna three ounces,
Purified Sugar a pound,
Boiling Water a pint;

Macerate the Senna Leaves and Fennel Seeds in the Water with a gentle heat for an hour. Strain the liquor, and mix with it the Manna and Sugar; afterwards boil down to a proper consistence.

This is a purgative syrup intended for children. Dose, f℥ij. to f℥iv.

SYRUPUS SIMPLEX.

Simple Syrup.

Take of Purified Sugar two pounds and a half,
Water a pint;

Dissolve the Sugar in the Water by a water bath; and set it aside for twenty-four hours; afterwards take off the scum, and, if there be any dregs, pour off the clear liquor.

This syrup is, of course, intended to impart mere sweetness, without colour or flavour.

SYRUPUS TOLUTANUS.

Syrup of Tolu.

Take of Balsam of Tolu an ounce,
Boiling Water a pint,
Purified Sugar two pounds;

Boil the Balsam in the Water for half an hour in a covered vessel, frequently stirring, and strain the cooled liquor; afterwards add the Sugar, in the same manner as directed for simple Syrup.

It is employed merely to give a pleasant flavour to draughts and mixtures.

SYRUPUS ZINGIBERIS.

Syrup of Ginger.

Take of Ginger Root, sliced, two ounces,
Boiling Water a pint,
Purified Sugar two pounds;
Macerate the Ginger Root in the Water for four hours, and strain; afterwards add the Sugar in the same manner as directed for simple Syrup.

This syrup is impregnated with the flavour and warmth of the ginger, and is a useful adjunct to bitter infusions and griping purgatives.

CONFECTIONS.

If Confections, when long kept, have become hard, they are to be moistened with Water, so that their proper consistence may be restored.

CONFECTIO AMYGDALARUM.

Confection of Almonds.

Take of Sweet Almonds an ounce,
Gum Arabic, powdered, a drachm,
Purified Sugar half an ounce;
The Almonds being first macerated in Water, and their external coat removed, pound all the ingredients together, until incorporated.

This confection is used as affording an expeditious mode of preparing the Mistura Amygdalarum.

CONFECTIO AROMATICA.

Aromatic Confection.

Take of Cinnamon Bark,
Nutmegs, each two ounces,
Cloves an ounce,
Cardamom Seeds half an ounce,
Saffron, dried, two ounces,
Prepared Shells sixteen ounces,
Purified Sugar, powdered, two pounds,
Water a pint;

Rub the dry ingredients together to a very fine powder; then add the Water gradually, and mix until incorporated.

Medicinal Uses.—Stimulant. Cordial. Dose, gr. xx. to ʒj. or more. It is incompatible with acids, acidulous salts, and metallic solutions, on account of the carbonate of lime which it contains.

CONFECTIO AURANTIORUM.

Confection of Orange Peel.

Take of the outer fresh Rind of Oranges, separated by a rasp, a pound,
Purified Sugar three pounds;

Bruise the Rind with a wooden pestle in a stone mortar; then, the Sugar being added, again pound until incorporated.

This confection is a pleasant vehicle for the exhibition of tonic powders, and for making up electuaries.

CONFECTIO CASSIÆ.

Confection of Cassia.

Take of fresh Cassia Pulp half a pound,
Manna two ounces,
Tamarind Pulp an ounce,
Syrup of Rose half a pint;

Bruise the Manna; then dissolve it in the Syrup by a water bath; afterwards mix in the Pulps, and evaporate the moisture until it acquires a proper consistence.

This confection is a purgative in doses of ʒj. to ℥j. It is but little used.

CONFECTIO OPII.

Confection of Opium.

Take of Hard Opium, powdered, six drachms,
Long Pepper an ounce,
Ginger Root two ounces,
Carraway Seeds three ounces,
Tragacanth, powdered, two drachms,
Syrup a pint;

Rub the Opium with the Syrup, made hot; then add the rest of the powders, and mix.

Medicinal Properties.—Narcotic. Stimulant. Dose, gr. x. to gr. xxx. One grain of opium is combined in about 36 grains of this confection.

CONFECTIO PIPERIS NIGRIS.

Confection of Black Pepper.

Take of Black Pepper,
Elecampane Root, each a pound,
Fennel Seeds three pounds,
Honey,
Purified Sugar, each two pounds;

Rub the dry ingredients together, to a very fine powder; afterwards, the Honey being added, pound until incorporated.

Medicinal Uses.—This preparation is now first introduced into the Pharmacopœia; it is probably intended as a substitute for Ward's Paste for Piles, &c. Dose, from ʒj. to ʒij. With respect to Ward's paste, Dr. Paris observes, that "it is principally useful in those cases attended with considerable debility, in leucophlegmatic habits, and when piles arise from a deficient secretion in the rectum;" in cases attended with inflammation it does harm.

CONFECTIO ROSÆ CANINÆ.

Confection of Dog Rose (Hips).

Take of Dog Rose Pulp a pound,
Purified Sugar, powdered, twenty ounces;

Expose the Pulp to a gentle heat in a water bath; then add the Sugar gradually, and rub together until incorporated.

This is principally employed as an agreeable vehicle for making up more active medicines into pills and electuaries.

CONFECTIO ROSÆ GALLICÆ.

Confection of Red Rose.

Take of Red Rose Petals, before blown, and without the calyces, a pound,
Purified Sugar three pounds;
Bruise the Petals in a stone mortar; then, the Sugar being added, pound them again until incorporated.

This confection is employed for the same purposes as the last.

CONFECTIO RUTÆ.

Confection of Rue.

Take of Rue Leaves, dried,
Carraway Seeds,
Bay Berries, each an ounce and a half,
Sagapenum half an ounce,
Black Pepper two drachms,
Clarified Honey sixteen ounces;
Rub the dry ingredients together to a very fine powder; then, the Honey being added, mix them all.

This confection is used as an antispasmodic in enemas only.

CONFECTIO SCAMMONEÆ.

Confection of Scammony.

Take of Scammony Gum Resin, powdered, an ounce and a half,
Cloves, bruised,
Ginger Root, powdered, each six drachms,
Oil of Carraway half a fluidrachm,
Syrup of Rose as much as may be sufficient;

Rub the dry ingredients together to very fine powder; then, the Syrup being gradually poured in, rub again; afterwards, the Oil of Carraway being added, mix them all.

This is a stimulating cathartic, and may be given in the dose of ʒss. to ʒj. It is but seldom used.

CONFECTIO SENNÆ.

Confection of Senna.

Take of Senna Leaves eight ounces,
Figs a pound,
Tamarind Pulp,
Cassia Pulp,
Pulp of Prunes, each half a pound,
Coriander Seeds four ounces,
Liquorice Root three ounces,
Purified Sugar two pounds and a half;

Rub the Senna Leaves with the Coriander Seeds, and by a sieve separate ten ounces of the mixed powder. Boil down the residue with the Figs and the Liquorice Root in four pints of Water, to half; then press out

[the liquor] and strain. Evaporate this strained liquor in a water bath, until of the whole a pint and a half remains; then, the Sugar being added, let a Syrup be made. Lastly, rub the Pulps gradually with the Syrup, and, having thrown in the sifted powder, mix them all.

This is much employed as a laxative, but is generally very badly prepared, containing neither senna nor cassia, and sold for one-third the price which the genuine preparation costs. Dose, ʒij. or more.

POWDERS.

PULVIS ALÖES COMPOSITUS.

Compound Powder of Aloes.

Take of Extract of spiked Aloe an ounce and a half,
Guaiacum Gum Resin an ounce,
Compound Powder of Cinnamon half an ounce;

Rub the Extract of Aloe and the Guaiacum Gum Resin separately to powder; afterwards mix them with the Compound Powder of Cinnamon.

This powder is cathartic and sudorific. Dose, gr. x. to gr. xx. It is seldom employed.

PULVIS CINNAMOMI COMPOSITUS.

Compound Powder of Cinnamon.

Take of Cinnamon Bark two ounces,
Cardamom Seeds an ounce and a half,
Ginger Root an ounce,
Long Pepper half an ounce;
Rub them together, that a very fine powder may be made.

This preparation is stimulant and carminative. Dose, gr. v. to gr. x. in the form of bolus, or mixed with water. It is generally employed to give warmth to more active remedies.

PULVIS CONTRAJERVÆ COMPOSITUS.

Compound Powder of Contrajerva.

Take of Contrajerva Root, powdered, five ounces,
Prepared Shells a pound and a half;
Mix.

This powder is not much employed. Dose, as a diaphoretic gr. xv. to xl. Acids and acidulous salts are incompatible with it, on account of the carbonate of lime which enters into its composition.

PULVIS CORNU USTI CUM OPIO.

Powder of Burnt Horn with Opium.

Take of Hard Opium, powdered, a drachm,
Horns, burnt and prepared, an ounce,
Cochineal, powdered, a drachm;
Mix.

Narcotic. Gr. x. contain one of opium. The burnt horn is employed merely to divide the opium, and the cochineal to colour the mixture.

PULVIS CRETÆ COMPOSITUS.

Compound Powder of Chalk.

Take of Prepared Chalk half a pound,
Cinnamon Bark four ounces,
Tormentil Root,
Gum Arabic, each three ounces,
Long Pepper half an ounce;
Rub them separately to very fine powder; afterwards mix.

Astringent and antacid. Dose, gr. v. to gr. xxx.

PULVIS CRETÆ COMPOSITUS CUM OPIO.

Compound Powder of Chalk with Opium.

Take of Compound Powder of Chalk six ounces and a half,
Hard Opium, powdered, four scruples;
Mix.

Astringent. Anodyne. Dose, gr. v. to gr. xxx. Forty grains contain one grain of opium. This and the former preparation, on account of the carbonate of lime which they contain, are incompatible with acids and acidulous salts.

PULVIS IPECACUANHÆ COMPOSITUS.

Compound Powder of Ipecacuanha.

Take of Ipecacuanha Root, powdered,
Hard Opium, powdered, each a drachm,
Sulphate of Potash, powdered, an ounce;
Mix.

This powder has been long employed as a sudorific, under the name of Dover's Powder. The sulphate of potash is used merely to divide the more active ingredients. In doses of gr. v. to gr. xx. it acts as a powerful sudorific; it may be given diffused in a mucilaginous fluid, or in the form of bolus. Ten grains contain one grain of opium.

PULVIS KINO COMPOSITUS.

Compound Powder of Kino.

Take of Kino fifteen drachms,
Cinnamon Bark half an ounce,
Hard Opium a drachm;
Rub them separately to very fine powder; afterwards mix.

Astringent. Dose, gr. v. to gr. xx.

PULVIS SCAMMONEÆ COMPOSITUS.

Compound Powder of Scammony.

Take of Scammony Gum Resin,
Hard Extract of Jalap, each two ounces,
Ginger Root half an ounce;

Rub them separately to very fine powder; afterwards mix.

Cathartic. Dose, gr. v. to gr. xx.

PULVIS SENNÆ COMPOSITUS.

Compound Powder of Senna.

Take of Senna Leaves,
Supertartrate of Potash, each two ounces,
Scammony Gum Resin half an ounce,
Ginger Root two drachms;
Rub the Scammony Gum Resin by itself, and the rest together, to a very fine powder; then mix.

Cathartic. Dose, gr. xx. to ʒi.

PULVIS TRAGACANTHÆ COMPOSITUS.

Compound Powder of Tragacanth.

Take of Tragacanth, powdered,
Gum Arabic, powdered,
Starch, each an ounce and a half,
Purified Sugar three ounces;
Rub the Starch and Sugar together to powder; then, the Tragacanth and Gum Arabic being added, mix them all.

Demulcent. Dose, gr. x. to ʒi.

PILLS.

PILULÆ ALÖES COMPOSITÆ.

Compound Pills of Aloes.

Take of Extract of spiked Aloe, powdered, an ounce,
Extract of Gentian half an ounce,
Oil of Carraway forty minims,
Simple Syrup as much as may be sufficient;
Beat them together until incorporated.

Purgative. Stomachic, in habitual costiveness. Dose, gr. x. to gr. xx.

PILULÆ ALÖES CUM MYRRHA.

Pills of Aloes with Myrrh.

Take of Extract of spiked Aloe two ounces,
Saffron,
Myrrh, each an ounce,
Simple Syrup as much as may be sufficient;
Rub the Extract and Myrrh separately to powder; then beat the whole together until incorporated.

This preparation is commonly called Pilulæ Rufi, and has been very long in use. Dose, gr. x. to gr. xx. as a stimulant and cathartic.

PILULÆ CAMBOGIÆ COMPOSITÆ.

Compound Pills of Camboge.

Take of Camboge, powdered, a drachm,
Extract of spiked Aloe, powdered, a drachm and a half,
Ginger, powdered, half a drachm,
Hard Soap two drachms;

Mix the Powders together; afterwards, the Soap being added, beat the whole together until incorporated.

Cathartic. Dose, gr. x. to gr. xx.

PILULÆ FERRI COMPOSITÆ.

Compound Pills of Iron.

Take of Myrrh, powdered, two drachms,
Subcarbonate of Soda,
Sulphate of Iron,
Sugar, each a drachm;

Rub the Myrrh with the Subcarbonate of Soda; then, the Sulphate of Iron being added, rub them again; afterwards beat the whole until incorporated.

In this preparation the sulphate of iron is decomposed by the subcarbonate of soda, precisely in the same manner, and with the production of compounds similar to those which result during the preparation of Ferri Subcarbonas. While, however, the sulphate of soda is washed away from the subcarbonate of iron, it remains with it in preparing the pills,

but the quantity is so extremely small as to be quite unimportant. Nearly the same precautions as those which have been given with respect to the Mistura Ferri Composita, will apply to this preparation; viz. that the pills should be prepared only at the moment in which they are wanted, for the protocarbonate of iron at first formed is very readily converted into peroxide by absorbing the oxygen of the atmosphere, by which its solubility and power are diminished. The dose is from gr. x. to gr. xx. two or three times a day, in the same cases as the Mistura Ferri Composita.

One grain of protoxide of iron is contained in about gr. xx. of this preparation, and also in f℥iss. of the Mistura Ferri Composita.

PILULÆ GALBANI COMPOSITÆ.

Compound Pills of Galbanum.

Take of Galbanum Gum Resin an ounce,
Myrrh,
Sagapenum, each an ounce and a half,
Assafœtida Gum Resin half an ounce,
Simple Syrup as much as may be sufficient;
Beat them together until incorporated.

Antispasmodic and emmenagogue. Dose, gr. x. to gr. xx.

PILULÆ HYDRARGYRI.

Pills of Mercury.

Take of Purified Mercury two drachms,
Confection of Red Rose three drachms,
Liquorice Root, powdered, a drachm;

Rub the Mercury with the Confection, until globules are no longer seen; then, the Liquorice Root being added, beat the whole together until incorporated.

Process.—The mercury in this preparation is probably in the state of minute division.

Medicinal Uses.—It is by far the best form for the internal exhibition of mercury; when it is intended to act upon the system as an alterative, it should be administered in doses of from gr. iv. to gr. vj. Opium may be advantageously given with it, if it should occasion irritation. In doses, from gr. x. to gr. xx. it acts as a mild but efficient purgative.

PILULÆ HYDRARGYRI SUBMURIATIS COMPOSITÆ.

Compound Pills of Submuriate of Mercury.

Take of Submuriate of Mercury,
Precipitated Sulphuret of Antimony, each two drachms,
Guaiacum Gum Resin, powdered, half an ounce,
Rectified Spirit half a drachm;

Rub the Submuriate of Mercury with the precipitated Sulphuret of Antimony, afterwards with the Guaiacum Gum Resin, and add the Spirit, that a proper consistence may be obtained.

Medicinal Uses.—Alterative. Dose, gr. v. to gr. x. This pill is much employed in cutaneous eruptions, and in secondary syphilitic symptoms, particularly when affecting the skin. It is commonly known by the name of ***Plummer's Pill.***

PILULÆ SAPONIS CUM OPIO.

Pills of Soap with Opium.

Take of Hard Opium, powdered, half an ounce,
Hard Soap two ounces;
Beat them together until incorporated.

Medicinal Uses.—Anodyne. Narcotic. Dose, gr. iij. to gr. x. Five grains contain one grain of opium.

PILULÆ SCILLÆ COMPOSITÆ.

Compound Pills of Squill.

Take of Squill Root, fresh dried and powdered, a drachm,
Ginger Root, powdered,
Hard Soap, each three drachms,
Ammoniacum, powdered, two drachms;
Mix the Powders together; then beat them with the Soap, and add of simple Syrup as much as may be sufficient to obtain a proper consistence.

Medicinal Uses.—Expectorant. Diuretic. Dose, gr. x. to gr. xx.

PREPARATIONS FROM ANIMALS.

ADEPS PREPARATA.

Prepared Lard.

Cut the Lard into small pieces; then, being melted with a slow fire, press it through a linen cloth.

This might have been introduced into the Materia Medica, as it is always to be met with in the shops.

CORNU USTUM.

Burnt Horn.

Burn pieces of Horns in an open fire until they are perfectly white; then powder and prepare them, in the same manner which is directed for Chalk.

This is an insoluble, inert compound, consisting almost entirely of phosphate of lime.

SEVUM PRÆPARATUM.

Prepared Suet.

Cut the Suet into small pieces; then, being melted with a slow fire, press it through a linen cloth.

SPONGIA USTA.

Burnt Sponge.

Cut the Sponge into small pieces, and beat it so that it may be separated from any adhering extraneous matters; then burn it in a covered iron vessel until it becomes black and friable; lastly, rub it to very fine powder.

Medicinal Uses.—Tonic. Deobstruent. Antacid. Dose, ʒj. to ʒiij. in the form of an electuary. It consists of charcoal, mixed with small portions of phosphate and carbonate of lime, and with subcarbonate of soda; it has been asserted that it contains *iodine*, and that its efficacy in bronchocele is owing to it.

TESTÆ PRÆPARATÆ.

Prepared Shells.

Wash the Shells, first freed from impurities, with boiling Water; then prepare them in the same manner which is directed for Chalk.

Shell is a much harder carbonate of lime than chalk, and is consequently more difficult of reduction to a fine powder; it does not appear to possess any good quality which is not to be found in chalk.

EMPLASTRUM AMMONIACI.

Plaster of Ammoniacum.

Take of purified Ammoniacum five ounces,
Diluted Acetic Acid half a pint;
Liquefy the Ammoniacum in the Acid; then evaporate the liquor in an iron vessel with a water bath, constantly stirring, until a proper consistence is obtained.

Medicinal Uses.—Stimulant and discutient, applied to white swellings, scrophulous tumours, &c.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

Plaster of Ammoniacum with Mercury.

Take of purified Ammoniacum a pound,
Purified Mercury three ounces,
Sulphurated Oil a fluidrachm;
Rub the Mercury with the Sulphurated Oil until globules are no longer seen; then gradually add the Ammoniacum melted, and mix them all.

Medicinal Uses.—Similar to the former, but more powerful, especially in venereal nodes.

EMPLASTRUM CANTHARIDIS.

Plaster of Cantharides.

Take of Cantharides, rubbed to very fine powder, a pound,
Wax Plaster a pound and a half,
Prepared Lard half a pound;
Sprinkle the Cantharides in the Plaster and Lard melted together, and removed from the fire, a little before they concrete, and mix them all.

In spreading this plaster, great care should be taken that heat be not employed, or that it be barely sufficient to soften the plaster; a high temperature decomposes the animal matter, and totally destroys its efficacy.

EMPLASTRUM CERÆ.

Plaster of Wax.

Take of yellow Wax,
Prepared Suet, each three pounds,
Yellow Resin a pound;
Melt them together, and strain.

This plaster is principally used as an ingredient in the preceding.

EMPLASTRUM CUMINI.

Plaster of Cumin Seeds.

Take of Cumin Seeds,
Carraway Seeds,
Bay Berries, each three ounces,
Burgundy Pitch three pounds,
Yellow Wax three ounces,
Olive Oil,
Water, each a fluidounce and a half;

Add the dry ingredients rubbed to powder, the Olive Oil and Water, to the Pitch and Wax melted together; then boil down to a proper consistence.

Medicinal Uses.—Stimulant and discutient.

EMPLASTRUM GALBANI COMPOSITUM.

Compound Plaster of Galbanum.

Take of purified Galbanum Gum Resin eight ounces,
Lead Plaster three pounds,
Common Turpentine ten drachms,
Resin of the Spruce Fir, powdered, three ounces;

Add first the Resin of the Spruce Fir, then the Lead Plaster melted with a slow fire, to the Galbanum Gum Resin and Turpentine melted together, and mix them all.

Medicinal Uses.—Stimulant. Discutient. It is more powerful than the preceding, and is said to be particularly serviceable in cases of indolent glandular enlargements of a strumous character.

EMPLASTRUM HYDRARGYRI.

Plaster of Mercury.

Take of purified Mercury three ounces,
Sulphurated Oil a fluidrachm,
Lead Plaster a pound;

Rub the Mercury with the Sulphurated Oil until globules are no longer seen; then add gradually the Lead Plaster, melted, and mix them all.

Medicinal Uses.—Alterative. Discutient. It is less powerful than the Emplastrum Ammoniaci cum Hydrargyro.

EMPLASTRUM OPII.

Plaster of Opium.

Take of Hard Opium, powdered, half an ounce,
Resin of the Spruce Fir, powdered, three ounces,
Lead Plaster a pound,
Water half a pint;

Add the Resin of the Spruce Fir, the Opium, and the Water to the melted Plaster, and with a slow fire boil down, until the whole unite into the consistence of a plaster.

Medicinal Uses.—Anodyne; but its powers are questionable.

EMPLASTRUM PICIS COMPOSITUM.

Compound Plaster of Pitch.

Take of Burgundy Pitch two pounds,
Resin of the Spruce Fir a pound,
Yellow Resin,
Yellow Wax, each four ounces,
Expressed Oil of Nutmegs an ounce,
Olive Oil,
Water, each two fluidounces;

Add first the Resin of the Spruce Fir, then the Oil of Nutmegs, the Olive Oil, and the Water, to the Pitch, Resin, and Wax melted together. Lastly, mix them all, and boil down to a proper consistence.

Medicinal Uses.—Stimulant. Rubefacient in pulmonary complaints; but it frequently produces too great a degree of irritation.

EMPLASTRUM PLUMBI.

Plaster of Lead.

Take of semi-vitreous Oxide of Lead, rubbed to very fine powder, five pounds,
Olive Oil a gallon,
Water two pints;

Boil them together over a slow fire, constantly stirring, until the Oil and Oxide of Lead unite into the consistence of a plaster; but it will be proper to add a little boiling Water, if nearly the whole of that which was used in the beginning should be consumed before the end of the boiling.

Medicinal Uses.—It is largely employed as the basis of many other plasters, and is a common application to excoriations, and for retaining the edges of fresh cut wounds in a state of apposition, and defending them from the air.

EMPLASTRUM RESINÆ.

Plaster of Resin.

Take of yellow Resin half a pound,
Lead Plaster three pounds;
Add the Resin, in powder, to the Lead Plaster melted over a slow fire, and mix.

Medicinal Uses.—Stimulant. Defensive.

EMPLASTRUM SAPONIS.

Plaster of Soap.

Take of hard Soap, sliced, half a pound,
Lead Plaster three pounds;
Mix the Soap with the melted Plaster; then boil down to a proper consistence.

Medicinal Use.—Discutient.

CERATUM CALAMINÆ.

Cerate of Calamine.

Take of prepared Calamine,
Yellow Wax, each half a pound,
Olive Oil a pint;
Mix the Oil with the melted Wax; then remove them from the fire, and when first they begin to thicken, add the Calamine, and stir constantly, until they cool.

This cerate, well known by the name of Turner's cerate, is used as a dressing to excoriations and ulcers, and to burns after the inflammation has subsided.

CERATUM CANTHARIDIS.

Cerate of Cantharides.

Take of Cantharides, rubbed to very fine powder, a drachm,
Spermaceti Cerate six drachms;
Add the Cantharides to the Cerate softened by the fire, and mix.

This cerate is employed to promote a discharge from a blistered surface; it generally answers the purpose, without exciting much irritation; but sometimes occasions strangury, and produces swelling of the lymphatics, and general irritation.

CERATUM CETACEI.

Cerate of Spermaceti.

Take of Spermaceti half an ounce,
White Wax two ounces,
Olive Oil four fluidounces;

Add the Oil to the Spermaceti and Wax melted together, and stir them with a wooden spatula until they cool.

This is a soft cooling dressing, and is a convenient basis for more active preparations.

CERATUM PLUMBI ACETATIS.

Cerate of Acetate of Lead.

Take of Acetate of Lead, powdered, two drachms,
White Wax two ounces,
Olive Oil half a pint;

Dissolve the Wax in seven fluidounces of the Oil; then, to these add gradually the Acetate of Lead, separately rubbed with the rest of the Oil, and stir with a wooden spatula until they unite.

A cooling dressing, in cases of burns and excoriations.

CERATUM PLUMBI COMPOSITUM.

Compound Cerate of Lead.

Take of solution of Subacetate of Lead two fluidounces and a half,
Yellow Wax four ounces,
Olive Oil nine fluidounces,
Camphor half a drachm;

Mix the melted Wax with eight fluidounces of the Oil; then remove them from the fire, and, when first they begin to thicken, add gradually the solution of Subacetate of Lead, and stir them constantly with a wooden spatula until they cool; lastly, mix with them the Camphor dissolved in the rest of the Oil.

This is commonly known by the name of *Goulard's Cerate.* It is applicable to the same cases as the preceding cerate. It is stated to be particularly serviceable in chronic opthalmia of the tarsus, and for the increased secretion of tears, which so frequently affects the eyes of persons advanced in years.

CERATUM RESINÆ.

Cerate of Resin.

Take of yellow Resin,
Yellow Wax, each a pound,
Olive Oil a pint;

Melt the Resin and Wax together with a slow fire; then add the Oil, and press the Cerate while hot, through a linen cloth.

This is commonly called *yellow basilicon.* It is employed as an application to foul and indolent ulcers.

CERATUM SABINÆ.

Cerate of Savine.

Take of fresh Savine Leaves, bruised, a pound,
Yellow Wax half a pound,
Prepared Lard two pounds;
Boil the Savine Leaves, in the Lard and Wax melted together; then press through a linen cloth.

In those cases in which the use of Ceratum Cantharidis excites too much irritation, this has been recommended as a substitute.

CERATUM SAPONIS.

Cerate of Soap.

Take of hard Soap eight ounces,
Yellow Wax ten ounces,
Semi-vitreous Oxide of Lead, powdered, a pound,
Olive Oil a pint,
Vinegar a gallon;
Boil the Vinegar with the Oxide of Lead with a slow fire, constantly stirring them until they unite; then add the Soap, and boil again in a similar manner, until the moisture is entirely evaporated; lastly, mix with these the Wax previously dissolved in the Oil.

This cerate is occasionally used as a cooling dressing.

CERATUM SIMPLEX.

Simple Cerate.

Take of Olive Oil four fluidounces,
Yellow Wax four ounces;
Add the Oil to the melted Wax, and strain.

This is used as a cooling dressing, and as a basis for more active preparations.

OINTMENTS.

UNGUENTUM CANTHARIDIS.

Ointment of Cantharides.

Take of Cantharides, rubbed to very fine powder, two ounces,
Distilled Water eight fluidounces,
Cerate of Resin eight ounces;
Boil down the Water with the Cantharides to half, and strain. Mix the Cerate with the strained liquor; afterwards let it evaporate to a proper consistence.

This is sometimes employed for the same purpose as the Ceratum Cantharidis; it is a milder preparation, and frequently inefficacious.

UNGUENTUM CETACEI.

Ointment of Spermaceti.

Take of Spermaceti six drachms,
White Wax two drachms,
Olive Oil three fluidounces;
Constantly stir them melted together with a slow fire, until they become cold.

There is no difference in the properties of this and the Ceratum Cetacei, excepting that the ointment is softer. They are used for similar purposes.

UNGUENTUM ELEMI COMPOSITUM.

Compound Ointment of Elemi.

Take of Elemi a pound,
Common Turpentine ten ounces,
Prepared Suet two pounds,
Olive Oil two fluidounces;
Melt the Elemi with the Suet; then remove them from the fire, and immediately mix with them the Turpentine and the Oil; afterwards press through a linen cloth.

Stimulant and digestive. It is used to keep open setons and issues, and as an application to ulcers which do not admit of the use of adhesive straps.

UNGUENTUM HYDRARGYRI FORTIUS.

Stronger Ointment of Mercury.

Take of purified Mercury two pounds,
Prepared Lard twenty-three ounces,
Prepared Suet an ounce;

First rub the Mercury with the Suet and a little of the Lard, until globules are no longer seen; then add that which is left of the Lard, and mix.

Process.—During trituration with the fatty matter, the mercury is probably reduced to the same state as that in which it exists in the Pilulæ Hydrargyri.

Medicinal Uses.—This ointment furnishes a prompt, and probably one of the least exceptionable modes of introducing mercury into the system. It is generally applied by rubbing ʒss. to ʒi. on some part of the body where the cuticle is thin, generally, in syphilitic cases, on the inside of the thigh: in chronic hepatitis it is usually applied in the region of the liver.

As the preparation of this ointment is an exceedingly tedious operation, various means, and most of them of an objectionable nature, have been resorted to in order to shorten it. Some employ Oleum Sulphuratum, the use of which, on account of the well known power of sulphur in diminishing the effects of mercury, ought always to be reprobated. By others, turpentine is used on account of its tenacity; but this is apt to produce pustules, which prevent the continuance of the friction. I have been assured that the admixture of a portion of old ointment, greatly facilitates the operation. The ointment contains half its weight of mercury.

UNGUENTUM HYDRARGYRI MITIUS.

Milder Ointment of Mercury.

Take of stronger Ointment of Mercury a pound,
Prepared Lard two pounds;

Mix.

This is used as a dressing, and for those purposes in which the preceding preparation would be too powerful. Six drachms contain one drachm of mercury.

UNGUENTUM HYDRARGYRI NITRATIS.

Ointment of Nitrate of Mercury.

Take of purified Mercury an ounce,
Nitric Acid eleven fluidrachms,
Prepared Lard six ounces,
Olive Oil four fluidounces;

First dissolve the Mercury in the Acid; afterwards mix the liquor, while hot, with the Lard and Oil, melted together.

Process.—By the decomposition of a portion of the nitric acid, the mercury is oxidized, and dissolved by the acid remaining undecomposed.

Medicinal Uses.—Stimulant and detergent. When its strength is diminished by the addition of lard, it is a local remedy of great efficacy in eruptions and various cutaneous diseases.

UNGUENTUM HYDRARGYRI NITRICO-OXYDI.

Ointment of Nitric-Oxide of Mercury.

Take of Nitric-oxide of Mercury an ounce,
White Wax two ounces,
Prepared Lard six ounces;

Add the Nitric-oxide of Mercury, rubbed to very fine powder, to the Wax and Lard, melted together, and mix.

This is applied in the same manner, and for similar purposes, as the preceding ointment.

UNGUENTUM HYDRARGYRI PRÆCIPITATI ALBI.

Ointment of White Precipitated Mercury.

Take of white Precipitated Mercury a drachm,
Prepared Lard an ounce and a half;
Add the Precipitated Mercury to the Lard, melted over a slow fire, and mix.

This ointment is stimulant and detergent.

UNGUENTUM PICIS NIGRÆ.

Ointment of Black Pitch.

Take of Black Pitch,
Yellow Wax,
Yellow Resin, each nine ounces,
Olive Oil a pint;
Melt them together, and press through a linen cloth.

Digestive and stimulant.

UNGUENTUM PICIS LIQUIDÆ.

Ointment of Liquid Pitch.

Take of Liquid Pitch (Tar),
Prepared Suet, each a pound;
Melt them together, and press through a linen cloth.

This ointment is employed for the removal of tetter, and in tinea capitis.

UNGUENTUM SAMBUCI.

Ointment of Elder.

Take of Elder Flowers,
Prepared Lard each two pounds;
Boil the Elder Flowers in the Lard until they become crisp; then press through a linen cloth.

This is used for the same purposes as the Unguentum Cetacei, over which it possesses no advantage but a pleasant smell.

UNGUENTUM SULPHURIS.

Ointment of Sulphur.

Take of sublimed Sulphur three ounces,
Prepared Lard half a pound;
Mix.

UNGUENTUM SULPHURIS COMPOSITUM.

Compound Ointment of Sulphur.

Take of sublimed Sulphur half a pound,
White Hellebore Root, powdered, two ounces,
Nitrate of Potash a drachm,
Soft Soap half a pound,
Prepared Lard a pound and a half;
Mix.

These ointments are both used for the cure of the itch; the latter sometimes excites too much irritation.

UNGUENTUM VERATRI.

Ointment of White Hellebore.

Take of White Hellebore Root, powdered, two ounces,
Prepared Lard eight ounces,
Oil of Lemons twenty minims;
Mix.

This is used for the cure of scabies, but is said to be less certain in its effects than the sulphur ointment.

UNGUENTUM ZINCI.

Ointment of Zinc.

Take of Oxide of Zinc an ounce,
Prepared Lard six ounces;
Mix.

This may be considered as an improvement upon the Ceratum Calaminæ. It is recommended as being very useful in some species of ophthalmia, smeared upon the tarsi every night.

LINIMENTS.

LINIMENTUM ÆRUGINIS.

Liniment of Verdigris.

Take of Verdigris, powdered, an ounce,
Vinegar seven fluidounces,
Clarified Honey fourteen ounces;

Dissolve the Verdigris in the Vinegar, and strain through a linen cloth; afterwards, the Honey being poured in, boil down to a proper consistence.

Detergent and escharotic.

LINIMENTUM AMMONIÆ FORTIUS.

Stronger Liniment of Ammonia.

Take of Solution of Ammonia a fluidounce,
Olive Oil two fluidounces;
Shake them together until they are mixed.

LINIMENTUM AMMONIÆ SUBCARBONATIS.

Liniment of Subcarbonate of Ammonia.

Take of Solution of Subcarbonate of Ammonia a fluidounce,
Olive Oil three fluidounces;
Shake them together until they are mixed.

In the former preparation, the union between the ammonia and oil is most perfect, on account of the carbonic acid combined with the ammonia of the latter; but in both cases a kind of fluid soap is formed. They are used as stimulants in cynanche tonsillaris, spread on flannel, and applied round the throat.

LINIMENTUM CAMPHORÆ.

Liniment of Camphor.

Take of Camphor half an ounce,
Olive Oil two fluidounces;
Dissolve the Camphor in the Oil.

This is employed as a stimulant embrocation to sprains and bruises, and in rheumatism.

LINIMENTUM CAMPHORÆ COMPOSITUM.

Compound Liniment of Camphor.

Take of Camphor two ounces,
Solution of Ammonia six fluidounces,
Spirit of Lavender a pint;
Mix the Solution of Ammonia with the Spirit; then let a pint distil from a glass retort, with a slow fire; lastly, dissolve the Camphor in it.

This is used for the same purposes as the former, and is much more powerful on account of the ammonia which it contains.

LINIMENTUM HYDRARGYRI.

Liniment of Mercury.

Take of stronger Ointment of Mercury,
Prepared Lard, each four ounces,
Camphor an ounce,
Rectified Spirit fifteen minims,
Solution of Ammonia four fluidounces;
Rub the Camphor, first with the Spirit, then with the Lard and Ointment of Mercury; lastly, the Solution of Ammonia being gradually poured in, mix them all.

This liniment is stimulant and discutient. One drachm, containing nearly ten grains of mercury, may be rubbed on the affected part night and morning. It is said to salivate sooner than mercurial ointment, when freely employed.

LINIMENTUM SAPONIS COMPOSITUM.

Compound Liniment of Soap.

Take of hard Soap three ounces,
Camphor an ounce,
Spirit of Rosemary a pint;
Dissolve the Camphor in the Spirit; afterwards add the Soap, and macerate in a sand bath until it is dissolved.

This is a stimulant application; it is less powerful than the Linimentum Camphoræ Compositum, but is used for similar purposes.

LINIMENTUM TEREBINTHINÆ.

Liniment of Turpentine.

Take of Cerate of Resin a pound,
Oil of Turpentine half a pint;
Add the Oil of Turpentine to the melted Cerate, and mix.

This is employed as a dressing to recent burns, and until the loosening of the eschars. It is represented to be an effectual remedy; the parts being first bathed with warm oil of turpentine, and the liniment applied over them, thickly spread on linen.

CATAPLASMS.

CATAPLASMA FERMENTI.

Cataplasm of Yest.

Take of Flour a pound,
Yest half a pint;
Mix, and apply a gentle heat until they begin to rise.

This is applied to painful and foul ulcers, and it is stated that it diminishes the fœtor of the discharge, and hastens the sloughing of the sores. Its efficacy is supposed to depend upon the carbonic acid gas evolved during the fermentation occasioned by the yest.

CATAPLASMA SINAPIS.

Cataplasm of Mustard.

Take of Mustard Seeds,
Linseed, each powdered, half a pound,
Hot Vinegar a sufficient quantity;
Mix, that the consistence of a Cataplasm may be acquired.

Stimulant and rubefacient; applied, spread on cloth, to the soles of the feet, in the low stage of typhus fever, when stupor or delirium is present. It is also used in the same way in apoplexy and coma, and other cases in which there is a great determination to the head.

TABLE OF NEW NAMES,

Showing to what name of the former Pharmacopœia each respectively belongs.

NEW NAMES.	FORMER NAMES.
Acidum aceticum dilutum.	Acidum aceticum.
——— arseniosum.	Oxydum Arsenici album.
Arsenicum album.	Arsenici Oxydum.
——————— sublimatum.	——————— sublimatum.
Calumba.	Calumbæ *Radix.*
Cantharis.	Lytta.
——— vesicatoria.	——— vesicatoria.
Ceratum Cantharidis.	Ceratum Lyttæ.
——— Plumbi Acetatis.	——— Plumbi Superacetatis.
Cucumis Colocynthis, *Peponum pulpa.*	Cucumis Colocynthis, *Pomorum pulpa.*
Elaterii *Pepones.*	Elaterii *Poma.*
Emplastrum Cantharidis.	Emplastrum Lyttæ.
Infusum Lini compositum.	Infusum Lini.
——— Rosæ compositum.	——— Rosæ.
——— Sennæ compositum.	——— Sennæ.
Magnesiæ Subcarbonas.	Magnesiæ Carbonas.
Marmor album.	Lapis calcarius.
Matonia Cardamomum.	Elettaria Cardamomum.
Pix abietina.	Pix arida.
——nigra.	Resina nigra.
Plumbi Acetas.	Plumbi Superacetas.
Tinctura Cantharidis.	Tinctura Lyttæ.
Vinum Antimonii tartarizati.	Liquor Antimonii tartarizati.
Unguentum Cantharidis.	Unguentum Lyttæ.
——————— Picis nigræ.	——————— Resinæ nigræ.

TABLE OF FORMER NAMES,

Showing to what name of the present Pharmacopœia each respectively belongs.

FORMER NAMES.	NEW NAMES.
Acidum aceticum.	Acidum aceticum dilutum.
Arsenici Oxydum.	Arsenicum album.
——————— sublimatum.	——— album sublimatum.
Calumbæ *Radix.*	Calumba.
Ceratum Lyttæ.	Ceratum Cantharidis.
———Plumbi Superacetatis.	———Plumbi Acetatis.
Cucumis Colocynthis, *Pomorum pulpa.*	Cucumis Colocynthis, *Peponum pulpa.*
Elaterii *Poma.*	Elaterii *Pepones.*
Elettaria Cardamomum.	Matonia Cardamomum.
Emplastrum Lyttæ.	Emplastrum Cantharidis.
Infusum Lini.	Infusum Lini compositum.
———Rosæ.	———Rosæ compositum.
———Sennæ.	———Sennæ compositum.
Lapis calcarius.	Marmor album.
Liquor Antimonii tartarizati.	Vinum Antimonii tartarizati.
Lytta.	Cantharis.
———vesicatoria.	——— vesicatoria.
Magnesiæ Carbonas.	Magnesiæ Subcarbonas.
Oxydum Arsenici album.	Acidum arseniosum.
Pix arida.	Pix abietina.
Plumbi Superacetas.	Plumbi Acetas.
Resina nigra.	Pix nigra.
Tinctura Lyttæ.	Tinctura Cantharidis.
Unguentum Lyttæ.	Unguentum Cantharidis.
——————— Resinæ nigræ.	——————— Picis nigræ.

TABLE,

Showing in what proportion Opium and certain Preparations of Antimony, Arsenic, and Mercury, are contained in some Compound Medicines.

CONFECTIO OPII *(Confection of Opium)*. About thirty-six grains contain one grain of opium.

HYDRARGYRUM CUM CRETA *(Mercury with Chalk)*. About three grains contain one grain of mercury.

LINIMENTUM HYDRARGYRI *(Liniment of Mercury)*. About six drachms contain one drachm of mercury.

LIQUOR ARSENICALIS *(Arsenical Solution)*. Two fluidrachms contain one grain of sublimed white arsenic.

LIQUOR HYDRARGYRI OXYMURIATIS *(Solution of Oxymuriate of Mercury)*. Two fluidounces contain one grain of oxymuriate of mercury.

PILULÆ HYDRARGYRI *(Pills of Mercury)*. Three grains contain one grain of mercury.

PILULÆ HYDRARGYRI SUBMURIATIS COMPOSITÆ *(Compound Pills of Submuriate of Mercury)*. About four grains contain one grain of submuriate of mercury.

PILULÆ SAPONIS CUM OPIO *(Soap Pills with Opium)*. Five grains contain one grain of opium.

PULVIS CORNU USTI CUM OPIO *(Powder of Calcined Horn with Opium)*. Ten grains contain one grain of opium.

PULVIS CRETÆ COMPOSITUS CUM OPIO *(Compound Powder of Chalk with Opium)*. Two scruples contain one grain of opium.

PULVIS IPECACUANHÆ COMPOSITUS *(Compound Powder of Ipecacuanha)*. Ten grains contain one grain of opium.

PULVIS KINO COMPOSITUS *(Compound Powder of Kino)*. One scruple contains one grain of opium.

VINUM ANTIMONII TARTARIZATI *(Wine of Tartarized Antimony)*. Four fluidrachms contain one grain of tartarized antimony.

UNGUENTUM HYDRARGYRI FORTIUS *(Stronger Ointment of Mercury)*. Two drachms contain one drachm of mercury.

UNGUENTUM HYDRARGYRI MITIUS *(Milder Ointment of Mercury)*. Six drachms contain one drachm of mercury.

TABLE,

Showing how much each Preparation of Iron contains one grain of Oxide.

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1 gr. of oxide is	contained in	gr. 3.8	Ferri Sulphas.
Do.	do.	gr. 1.2	—— Subcarbonas.
Do.	do.	gr. 66.0	Ferrum Ammoniatum.
Do.	do.	gr. 5.0	——— Tartarizatum.
Do.	do.	gr. 20.0	Pilulæ Ferri compositæ.
Do.	do.	♏ xxx	Liquor Ferri Alkalini.
Do.	do.	f℥ iss	Mistura Ferri composita.
Do.	do.	f℥ iij	Tinctura Ferri Ammoniati.
Do.	do.	♏ xiv	——————— Muriatis.
Do.	do.	f℥ j	Vinum Ferri.

TABLE,

Regulating the ordinary proportion of doses, according to the Age of the Patient.

For an Adult	1 e. g.	℥j.
From 21 Years to 14	$\frac{2}{3}$	℈ij.
14 ——— 7	$\frac{1}{2}$	℥ss.
7 ——— 4	$\frac{1}{3}$	℈j.
4	$\frac{1}{4}$	gr. xv.
3	$\frac{1}{6}$	gr. x.
2	$\frac{1}{8}$	gr. viij.
1	$\frac{1}{12}$	gr. v.

POSOLOGICAL TABLE.

Absinthium	℈j to	ʒj.
Acaciæ Gummi	ʒss	ʒij.
Acetum Colchici	fʒss	fʒj.
——— Scillæ	fʒss	fʒij.
Acidum aceticum dilutum	fʒj	fʒss.
——— benzoicum	gr. x	ʒss.
——— citricum	gr. x	ʒss.
——— muriaticum	♏ v	♏ xx.
——— nitricum dilutum	♏ x	♏ xl.
——— sulphuricum dilutum	♏ x	♏ xl.
——— tartaricum	gr. x	ʒss.
Aconiti Folia	gr. j	gr. v.
Æther rectificatus	fʒss	fʒij.
Ærugo	gr. ⅛	gr. j.
Allii Radicis Succus	fʒj	fʒij.
Aloes spicatæ Extractum	gr. v	gr. xv.
Alumen	gr. x	℈j.
Ammoniacum	gr. x	ʒss.
Ammoniæ Murias	gr. x	ʒss.
——— Subcarbonas	gr. v	℈j.
Anethi Semina	gr. x	ʒj.
Anisi Semina	gr. x	ʒj.
Anthemidis Flores	gr. x	ʒss.
Antimonii Sulphuretum	gr. x	ʒss.
——————— præcipitatum	gr. j	gr. iv.
Antimonium tartarizatum (Diaphoretic)	gr. ½	gr. ss.
——————— (Emetic)	gr. j	gr. ij.
Aqua Anethi		
—— Carui		
—— Cinnamomi		
—— Fœniculi		
—— Menthæ piperitæ	fʒij	fʒiv.
——— viridis		
—— Pimentæ		
—— Pulegii		

Argenti Nitras	gr. $\frac{1}{8}$ to	gr. $\frac{1}{4}$.
Armoraciæ Radix	℈j	ʒj.
Assafœtidæ Gummi-resina	gr. x	ʒss.
Balsamum Peruvianum	gr. x	ʒss.
——— tolutanum	gr. x	ʒss.
Belladonnæ Folia	gr. ss	gr. x.
Benzonium	gr. x	ʒss.
Bismuthi subnitras	gr. v	gr. xv.
Bistortæ Radix	gr. x	ʒj.
Cajuputi Oleum	♏j	♏v.
Calami Radix	gr. x	ʒj.
Calumbæ Radix	gr. x	℈j.
Cambogia	gr. ij	gr. x.
Camphora	gr. iij	℈j.
Canellæ Cortex	gr. x	ʒss.
Capsici Baccæ	gr. v	gr. x.
Cardamines Flores	℈j	ʒj.
Cardamomi Semina	gr. v	ʒss.
Carui Semina	gr. x	ʒj.
Caryophylli	gr. v	ʒss.
——— Oleum	♏ij	♏v.
Cascarillæ Cortex	gr. x	ʒj.
Cassiæ Pulpa	ʒss	ʒj.
Castoreum	gr. v	℈j.
Catechu Extractum	gr. x	℈ij.
Centaurii Cacumina	gr. xv	ʒj.
Cetaceum	℈j.	ʒiss.
Cinchonæ cordifoliæ Cortex	gr. x	ʒiss.
——— lancifoliæ Cortex	gr. x	ʒiss.
——— oblongifoliæ Cortex	gr. x	ʒiss.
Cinnamomi Cortex	gr. v	℈j.
——— Oleum	♏j	♏iij.
Colchici Radix	gr. j	gr. v.
Colocynthidis Pulpa	gr. j	gr. v.
Confectio Amygdalarum	ʒj	ʒij.
——— Aromatica	gr. x	ʒj.
——— Aurantiorum	ʒj	ʒj.

Confectio Cassiæ	ʒj to	℥j.
——— Opii	gr. x	ʒss.
——— Piperis nigri	ʒj	ʒij.
——— Rosæ caninæ	ʒj	℥j.
——— Gallicæ	ʒj	℥j.
——— Scammoneæ	℈j	ʒj.
——— Sennæ	ʒj	ʒiij.
Conii Folia	gr. ij	℈j.
Contrajervæ Radix	gr. x	ʒss.
Copaiba	℈j	ʒj.
Coriandri Semina	℈j	ʒj.
Creta præparata	gr. x	gr. xl.
Cubeba	ʒj	ʒij.
Cumini Semina	℈j	ʒj.
Cupri Sulphas	gr. ss	gr. ij.
——— (Emetic)	gr. ij	gr. x.
Cuprum ammoniatum	gr. ¼	gr. v.
Cuspariæ Cortex	gr. x	ʒj.
Dauci Semina	℈j	ʒj.
Decoctum Aloes compositum	f℥ss	f℥j.
——— Cinchonæ	f℥j	f℥iij.
——— Dulcamaræ	f℥ss	f℥j.
——— Lichenis	f℥j	f℥ij.
——— Sarsaparillæ	f℥iv	Oss
——— compositum	f℥iv	f℥vj.
——— Senegæ	f℥ss	f℥iij.
——— Ulmi	f℥iv	f℥vj.
Digitalis Folia	gr. ss	gr. iij.
Dolichi Pubes	gr. v	gr. x.
Extractum Aconiti	gr. ss	gr. v.
———Aloes	gr. v	gr. xv.
———Anthemidis	gr. x	℈j.
———Belladonnæ	gr. j	gr. v.
———Cinchonæ	gr. x	ʒss.
——— resinosum.....	gr. x	ʒss.
———Colocynthidis	gr. v	ʒss.
——— compositum ..	gr. v	ʒss.

Extractum Conii	gr. v	to ʒj.
——— Elaterii	gr. ss	gr. ij.
——— Gentianæ	gr. x	ʒss
——— Hæmatoxyli	gr. x	ʒss.
——— Humuli	gr. v	ʒj.
——— Hyoscyami	gr. v	ʒj.
——— Jalapæ	gr. x	ʒj.
——— Lactucæ	gr. v	gr. xv.
——— Opii	gr. j	gr. v.
——— Papaveris	gr. ij	ʒij.
——— Rhei	gr. x	ʒss.
——— Sarsaparillæ	gr. x	ʒj.
——— Stramonii	gr. ¾	gr. ij.
——— Taraxaci	gr. x	ʒj.
Ferri Sulphas	gr. j	gr. v.
—— Subcarbonas	gr. v	gr. xxx.
Ferrum ammoniatum	gr. iij	gr. xv.
——— tartarizatum	gr. x	ʒss.
Filicis Radix	ʒj	℥ss.
Fœniculi Semina	ʒj	ʒj.
Galbani Gummi-resina	gr. x	ʒss.
Gentianæ Radix	gr. x	ʒj.
Granati Cortex	ʒj	ʒj.
Guaiaci Resina	gr. x	ʒss.
Helenium	gr. x	ʒj.
Hellebori fœtidi Folia	gr. x	ʒss.
——— nigri Radix	gr. x	ʒj.
Humuli Strobili	gr. x	ʒj.
Hydrargyri Oxydum cinereum	gr. j	gr. iij.
——— rubrum	gr. ss	gr. j.
——— Oxymurias	gr. ⅛	gr. ¼.
——— Submurias (Alterative)	gr. ss	gr. j.
——— (Purgative)	gr. v	gr. x.
——— Sulphuretum nigrum	gr. v	ʒss.
Hydrargyrum cum Creta	gr. x	ʒss.
——— purificatum	℥ss	℥iv.
Hyoscyami Folia	gr. v	gr. x.

Jalapæ Radix	gr. x to	ʒss.
Infusum Anthemidis	fʒj	fʒij.
——Armoraciæ compositum	fʒj	fʒiss.
——Aurantii compositum	fʒj	fʒij.
——Calumbæ	fʒiss	fʒij.
——Caryophyllorum	fʒj	fʒij.
——Cascarillæ	fʒiss	fʒij.
——Catechu compositum	fʒiss	fʒiij.
——Cinchonæ	fʒj	fʒiij.
——Cuspariæ	fʒiss	fʒij.
——Digitalis	fʒij	fʒss.
——Gentianæ compositum.....	fʒiss	fʒij.
——Quassiæ	fʒiss	fʒij.
——Rhei	fʒj	fʒiij.
——Rosæ compositum	fʒj	fʒiss.
——Sennæ compositum	fʒiij	fʒiv.
——Simaroubæ	fʒj	fʒij.
Ipecacuanhæ Radix (Diaphoretic)	gr. ss	gr. ij.
——(Emetic)	gr. v	ʒss.
Juniperi Baccæ	ʒss	ʒj.
Kino	gr. x	ʒss.
Lavandulæ Flores	℈j	ʒj.
Lauri Baccæ et Folia	gr. x	ʒss.
Lichen	℈j	ʒj.
Linum catharticum	ʒss	ʒj.
Liquor Ammoniæ	♏x	♏xxx.
——Acetatis	fʒij	fʒvi.
——Subcarbonatis	fʒss	fʒj.
—— Arsenicalis	♏iv	♏xxx.
—— Calcis	fʒj	fʒvj.
—— Muriatis	♏xx	fʒj.
—— Ferri alkalini	fʒss	fʒj.
—— Hydrargyri oxymuriatis	fʒj	fʒss.
—— Potassæ	♏x	fʒss.
——Subcarbonatis	♏x	fʒj.

Magnesia	℥ss to	℥j.
——— Subcarbonas	℈j	℥j.
——— Sulphas	ℨss	ℨiss.
Malva	℈j	℥j.
Manna	ℨss	ℨij.
Mastiche	gr. x	℥ss.
Marrubium	℈j	℥j.
Mentha piperita	gr. x	℥j.
——— viridis	gr. x	℥j.
Menyanthes	℥ss	℥j.
Mezerei Cortex	gr. j	gr. x.
Mistura Ammoniaci	fℨss	fℨj.
———Assafœtidæ	fℨss	fℨj.
———Camphoræ	fℨss	fℨij.
———Cornu usti	fℨiv	Oss.
———Cretæ	fℨj	fℨij.
———Ferri composita	fℨj	fℨij.
———Guaiaci	fℨss	fℨij.
———Moschi	fℨj	fℨij.
Moschus	gr. ij	℈j.
Mucilago Acaciæ	f℥j	fℨj.
Myristicæ Nuclei	gr. v	gr. x.
Myrrha	gr. x	℥j.
Oleum Anisi	♏v	♏x.
——— Anthemidis	♏v	♏x.
——— Carui	♏j	♏v.
——— Caryophylli	♏j	♏v.
——— Cinnamomi	♏j	♏iij.
——— Juniperi	♏ij	♏x.
——— Lavandulæ	♏j	♏v.
——— Menthæ piperitæ	♏j	♏iij.
——— viridis	♏ij	♏v.
——— Origani	♏j	♏iij.
——— Pimentæ	♏ij	♏v.
——— Pulegii	♏j	♏v.
——— Ricini	f℥iv	fℨiss.
——— Rosmarini	♏ij	♏v.
——— Succini	♏x	f℥ss.

Oleum Sulphuratum	♏ x to	f℥ss.
——Terebinthinæ rectificatum (diuretic)	♏ x	f℥ss.
——————————— (vermifuge)	f℥ij	f℥j.
Olibanum	gr. x	℥ss.
Opium	gr. ss	gr. v.
Opoponax	gr. x	℥ss.
Origanum	gr. v	℈j.
Oxymel Simplex	f℥j	f℥j.
—— Scillæ	f℥ss	f℥ij.
Pilulæ Aloes compositæ	gr. x	℈j.
——————cum Myrrha	gr. x	℈j.
—— Cambogiæ compositæ	gr. x	℈j.
—— Ferri compositæ	gr. x	℈j.
—— Galbani compositæ	gr. x	℈j.
—— Hydrargyri (alterative)	gr. iv	gr. vi.
——————— (purgative)	gr. x	℈j.
——————— Submuriatis compositæ	gr. v	gr. x.
—— Saponis cum Opio	gr. iij	gr. x.
—— Scillæ compositæ	gr. x	℈j.
Pimentæ Baccæ	gr. v	℈j.
Piperis longi Fructus	gr. v	℈j.
—— nigri Baccæ	gr. v	℈j.
Plumbi Acetas	gr. ss	gr. j.
Porri Radicis Succus	f℥j	f℥ss.
Potassæ Acetas	℈j	℥j.
——————Carbonas	gr. x	℥ss.
——————Nitras	gr. x	℥ss.
——————Subcarbonas	gr. x	℥ss.
——————Sulphas	gr. x	ℨss.
——————Supersulphas	gr. x	℥ij.
——————Supertartras	℥j	ℨss.
——————Tartras	℥j	ℨj.
Pulegium	gr. x	℥j.
Pulvis Aloes compositus	gr. x	℈j.
—— Antimonialis	gr. v	gr. x.
—— Cinnamomi compositus	gr. v	gr. x.
—— Contrajervæ compositus	gr. xv	℥ss.
—— Cornu usti cum Opio	gr. xv	℥ss.

Pulvis Cretæ compositus	ʒss to	ʒj.
——— Cretæ compositus cum Opio	℈j	℈ij.
——— Ipecacuanhæ compositus	gr. v	℈j.
——— Kino compositus	gr. v	℈j.
——— Scammoneæ compositus	gr. x	℈j.
——— Sennæ compositus	℈j	ʒj.
——— Tragacanthæ compositus	gr. x	ʒj.
——— Pyrethri Radix	gr. iij	gr. x.
Quassiæ Lignum	gr. v	ʒss.
Quercus Cortex	gr. x	ʒss.
Rhamni Baccæ	ʒj	ʒij.
Rhei Radix	gr. x	ʒss.
Rosæ caninæ Pulpa	ʒj	℥j.
—— centifoliæ Petala	℈j	ʒj.
—— Gallicæ Petala	℈j	ʒj.
Rosmarini Cacumina	gr. x	ʒss.
Rubiæ Radix	ʒss	ʒj.
Rutæ Folia	gr. xv	℈ij.
Sabinæ Folia	gr. x	ʒss.
Sagapenum	gr. x	ʒss.
Salicis Cortex	gr. x	ʒss.
Sapo durus	gr. v	ʒss.
Sarsaparillæ Radix	℈j	ʒj.
Sassafras Lignum	℈j	ʒj.
Scammoneæ Gummi-resina	gr. v	℈j.
Scillæ Radix recens	gr. v	gr. xv.
———————exsiccata	gr. j	gr. iij.
Senegæ Radix	℈j	℈ij.
Sennæ Folia	℈j	ʒj.
Serpentariæ Radix	gr. x	ʒss.
Simaroubæ Cortex	gr. x	ʒss.
Sinapis Semina	ʒj	℥ss.
Soda tartarizata	ʒij	℥j.
Sodæ Boras	gr. x	ʒss.
—— Carbonas	gr. x	ʒss.
—— Subcarbonas	gr. x	ʒss.

Sodæ Subcarbonas exsiccata	gr. v to	gr. xv.
—— Sulphas	ʒss	ʒij.
Spartii Cacumina	℈j	ʒj.
Spigeliæ Radix	gr. x	℈ij.
Spiritus Ætheris aromaticus	fʒss	fʒj.
———— compositus	fʒss	fʒj.
———— nitrici	♏x	♏xl.
———— sulphurici	fʒj	fʒiij.
———— compositus	fʒj	fʒiij.
——— Ammoniæ aromaticus	fʒss	fʒj.
———— fœtidus	fʒss	fʒj.
———— succinatus	♏x	fʒss.
——— Anisi	fʒij	fʒss.
——— Armoraciæ compositus	fʒij	fʒss.
——— Carui	fʒij	fʒss.
——— Cinnamomi	fʒj	fʒss.
——— Colchici Ammoniatus	fʒss	fʒj.
——— Juniperi compositus	fʒij	fʒj.
——— Lavandulæ compositus	fʒss	fʒij.
——— Menthæ piperitæ	fʒj	fʒss.
———— viridis	fʒj	fʒss.
——— Myristicæ	fʒj	fʒss.
——— Pimentæ	fʒj	fʒss.
——— Pulegii	fʒj	fʒss.
Spongia usta	ʒj	ʒij.
Stannum	ʒj	ʒss.
Staphisagriæ Semina	gr. iij	gr. x.
Styracis Balsamum	gr. x	ʒss.
Sulphur lotum	ʒj	ʒij.
———præcipitatum	ʒj	ʒij.
Syrupus Papaveris	fʒj	fʒj.
———Rhamini	fʒss	fʒj.
Tabaci Folia	gr. ss	gr. v.
Tamarindi Pulpa	ʒss	ʒj.
Taraxaci Radix	ʒss	ʒj.
Terebinthina Canadensis	℈j	ʒj.
———Chia	℈j	ʒj.
——— ———vulgaris.....	℈j	ʒj.

Tiglii Oleum	gtt. j	to gtt. ij.
Tinctura Aloes	f℥ss	f℥iss.
——————composita	f℥j	f℥ij.
——————Assafœtidæ	f℥ss	f℥iss.
——————Aurantii	f℥ij	f℥iij.
——————Benzoini composita	f℥ss	f℥ij.
——————Calumbæ	f℥j	f℥iij.
——————Camphoræ composita	f℥j	f℥iij.
——————Cantharidis	♏x	f℥j.
——————Capsici	♏x	f℥j.
——————Cardamomi	f℥j	f℥ij.
——————————composita	f℥j	f℥ij.
——————Cascarillæ	f℥j	f℥ij.
——————Castorei	f℥ss	f℥ij.
——————Catechu	f℥j	f℥iij.
——————Cinchonæ	f℥j	f℥ij.
——————————composita	f℥j	f℥iij.
——————Cinnamomi	f℥j	f℥ij.
——————————composita	f℥j	f℥ij.
——————Digitalis	♏x	♏xl.
——————Ferri ammoniacalis	f℥ss	f℥ij.
——————————Muriatis	♏x	f℥j.
——————Gentianæ composita	f℥j	f℥ij.
——————Guaiaci	f℥j	f℥iij.
——————————ammoniatæ	f℥ss	f℥ij.
——————Hellebori nigri	f℥ss	f℥j.
——————Humuli	f℥ss	f℥ij.
——————Hyoscyami	f℥ss	f℥ij.
——————Jalapæ	f℥j	f℥ss.
——————Kino	f℥j	f℥ij.
——————Myrrhæ	f℥ss	f℥j.
——————Opii	♏x	f℥j.
——————Rhei	f℥ij	f℥iss.
——————————compositæ	f℥ij	f℥iss.
——————Scillæ	♏x	f℥ss.
——————Sennæ	f℥ij	f℥j.
——————Serpentariæ	f℥j	f℥iij.
——————Valerianæ	f℥j	f℥iij.
——————————ammoniata	f℥j	f℥ij.

Tinctura Zingiberis	fʒj to	fʒiſs.
Tormentillæ Radix	gr. x	ʒss.
Toxicodendri Folia	gr. ij	gr. xv.
Tragacantha	gr. x	ʒj.
Tussillago	ʒss	ʒj.
Valerianæ Radix	℈j	ʒij.
Veratri Radix	gr. ij	gr. v.
Vinum Aloes	fʒj	fʒij.
——— Antimonii tartarizati	♏x	fʒj.
——— Colchici	♏xxx	fʒj.
——— Ferri	fʒij	fʒj.
——— Ipecacuanhæ (Diaphoretic)	♏xx	♏xl.
——— ——— (Emetic)	fʒij	fʒss.
——— Opii	♏x	fʒj.
——— Veratri	♏v	♏x.
Ulmi Cortex	℈j	ʒj.
Uva Ursi	gr. x	ʒj.
Zinci Oxydum	gr. j	gr. vi.
—— Sulphas	gr. j	gr. v.
——— (Emetic)	gr. x	ʒss.
Zingiberis Radix	gr. v	ʒss.

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