

Alterations adopted in the London Pharmacopoeia of MDCCCXXIV fully stated ; with introductory remarks, and schemes illustrative of formulæ influenced by chemical action / by Richard Stocker.

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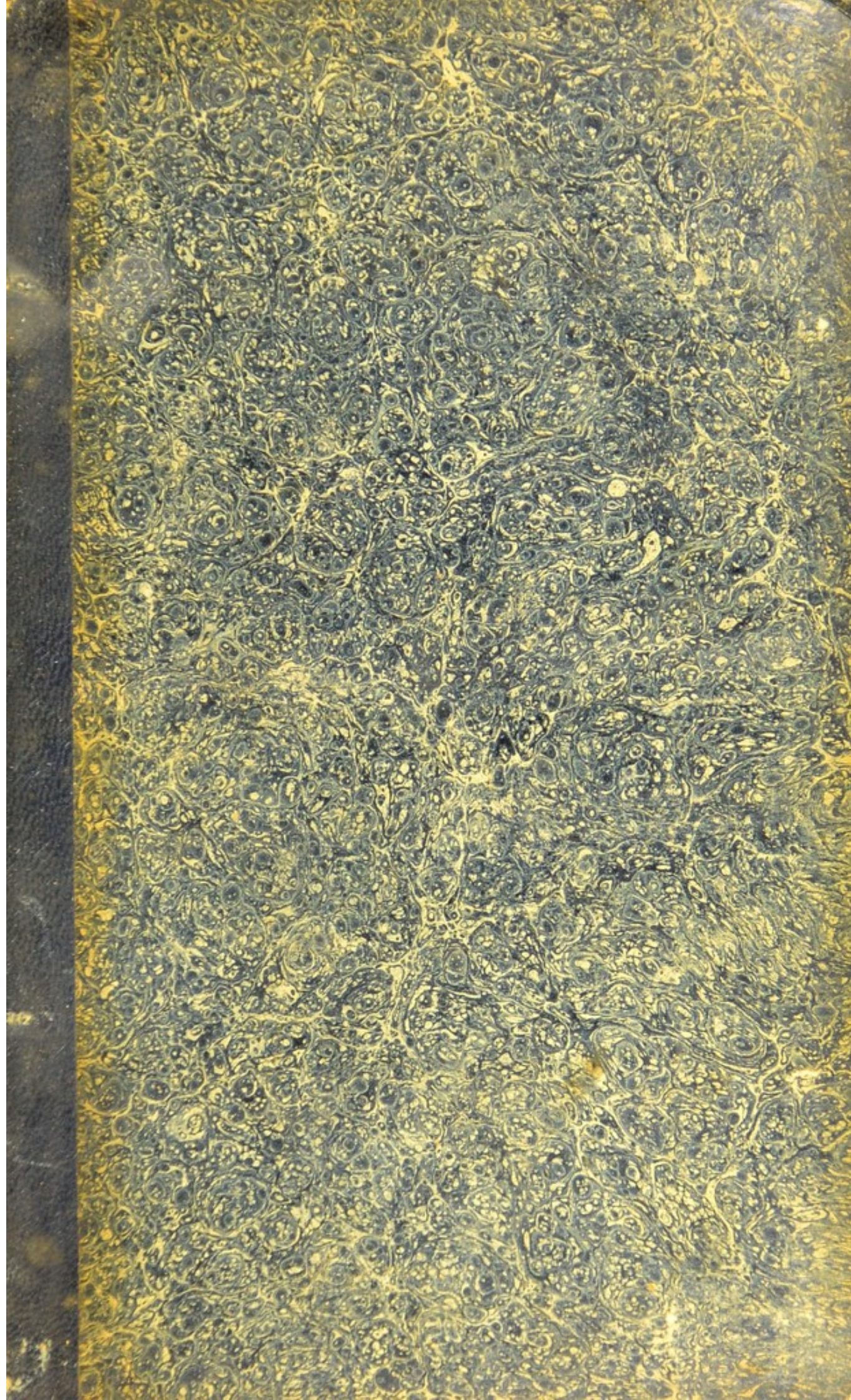
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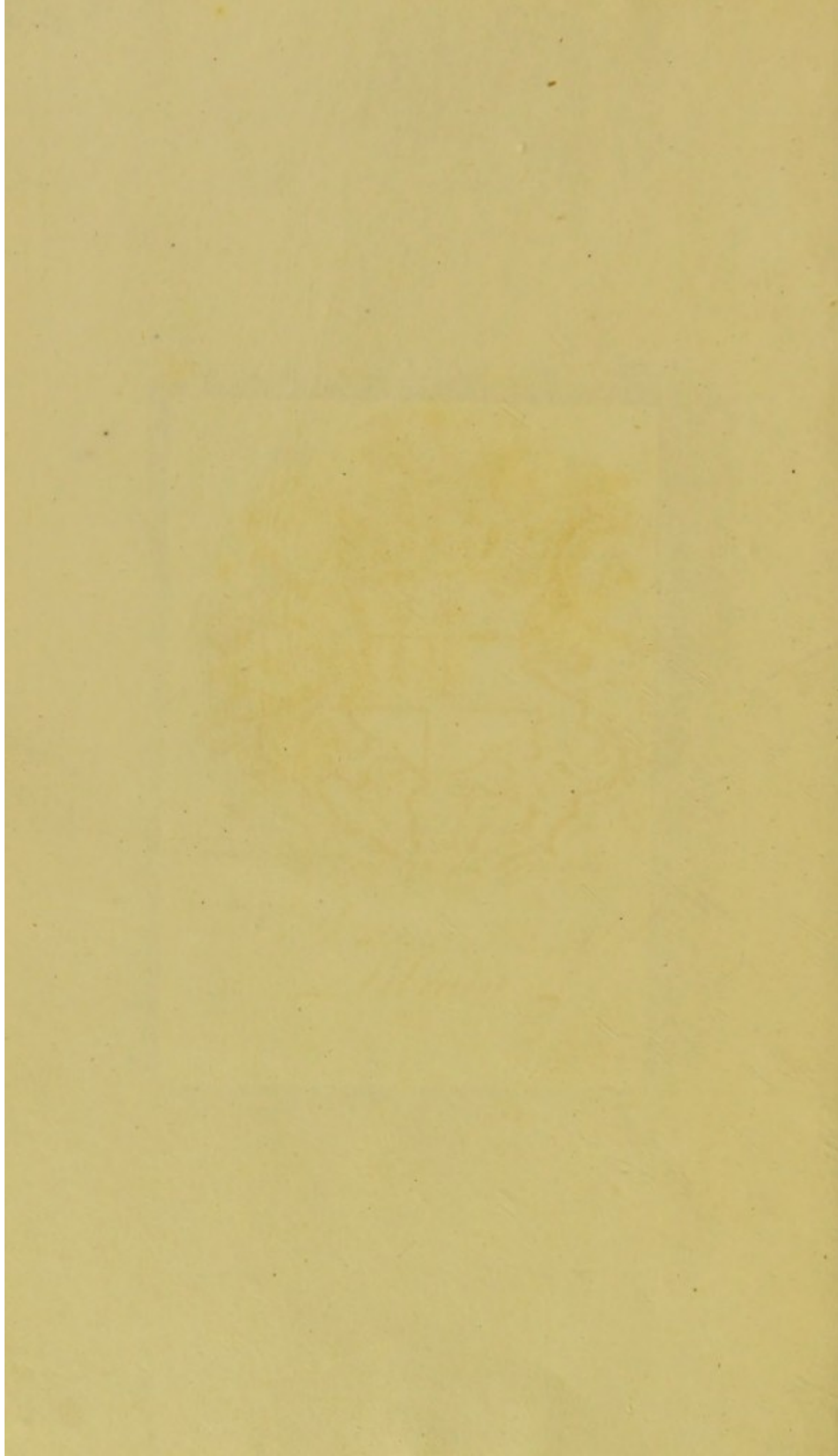
LONDON PHARMACOPOEIA

1824

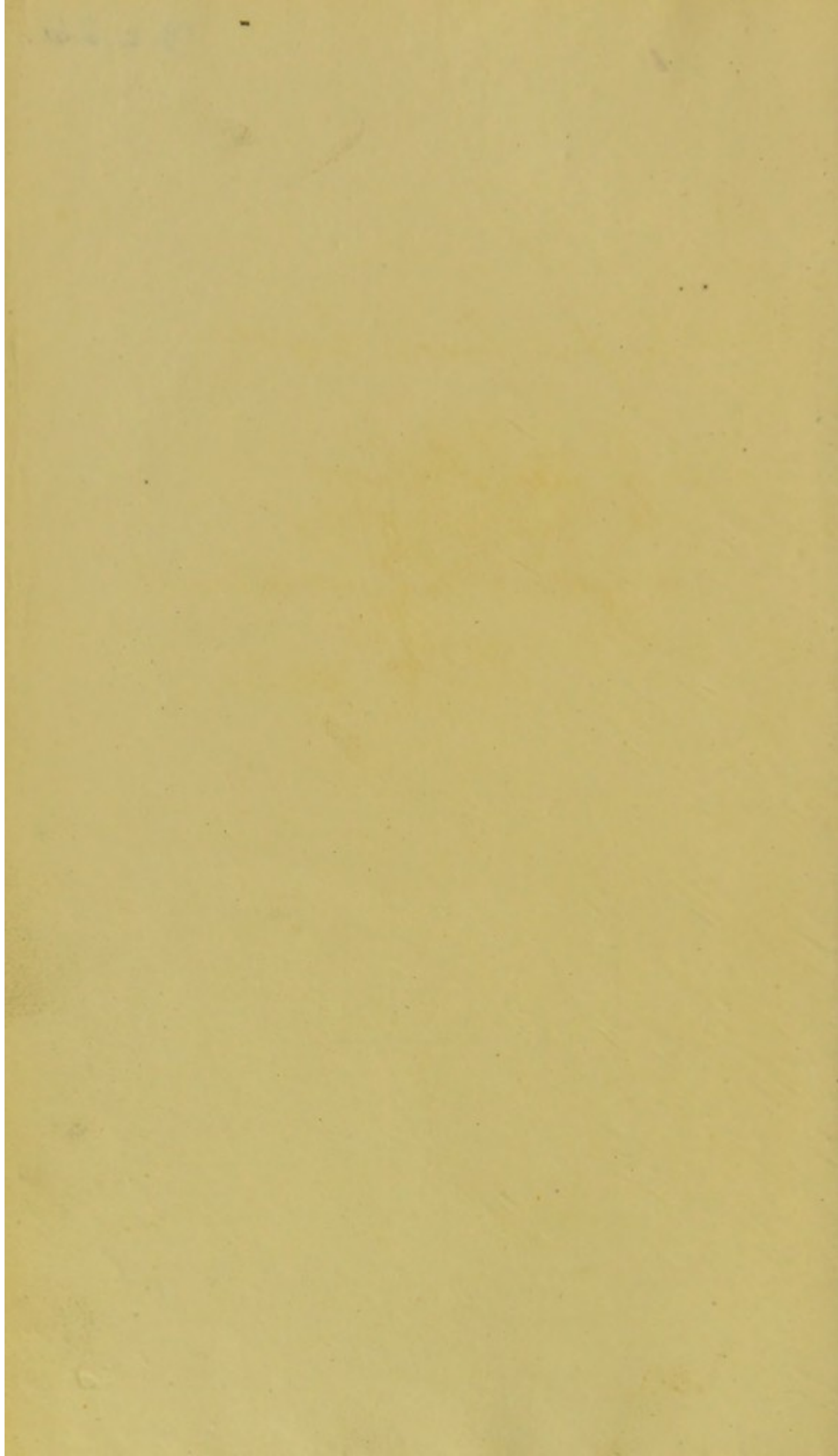
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ALTERATIONS

ADOPTED IN THE

LONDON PHARMACOPŒIA

OF MDCCCXXIV

FULLY STATED;

WITH

INTRODUCTORY REMARKS,

AND

SCHEMES

ILLUSTRATIVE OF FORMULÆ INFLUENCED BY

CHEMICAL ACTION.

~~~~~

BY RICHARD STOCKER,

APOTHECARY TO GUY'S HOSPITAL.

~~~~~

In nova fert animus mutatas dicere formas
Corpora—

—▶▶●◀◀—

London :

PRINTED FOR THOMAS & GEORGE UNDERWOOD,
32, FLEET STREET.

—
1824.

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Dimit

ALTERATIONS

ADAPTED IN THE

RESEARCH

LONDON PHARMACEUTICAL

OF MEDICINE

In the first part of the work the author has endeavored to give a general view of the progress of the science of medicine during the last century, and to show the influence of the various sciences upon it.

INTRODUCTORY REMARKS

SCHEMES

OF THE PHARMACEUTICAL

CHEMICAL ACTION



RICHARD STOCKER

APOTHECARY TO ST. GEORGE'S HOSPITAL

The author has endeavored to give a general view of the progress of the science of medicine during the last century, and to show the influence of the various sciences upon it.

London :

PRINTED FOR THOMAS & GEORGE UNDERWOOD,
15, FLEET STREET.

Printed by the Philanthropic Society, St. George's Fields.

PREFACE.

In the New London Pharmacopœia of 1824, so many alterations have been introduced, that it differs materially from that edited in 1809, and of which a second edition was published *with alterations* in 1815.

In the present work it is intended to give,

- I. A few preliminary observations, including some practical remarks on several of the preparations.
- II. An enumeration of all the particulars in which the present Pharmacopœia differs from that published as a second edition in 1815.
- III. A series of SCHEMES, in which considerable pains have been taken to point out clearly and satisfactorily, what compositions and decompositions must necessarily take place in those *Formulae* which are more obviously Chemical. And

Prefixed to the whole is a List of all the new Members of the College since 1809.

PREFACE.

The illustration of Chemical action by means of SCHEMES, similar to those subjoined to the present work, has for several years been with the Author a favorite mode of conveying instruction to his Pupils. By words alone he often found it difficult to communicate the precise ideas he wished; but when the information to be given could also be accompanied, as in the present instances, by Schemes of the facts alluded to, the youthful mind became far more susceptible of impression, and the Rationale of each process having been also visibly demonstrated, the idea was afterwards more permanently retained in the memory.

Segnius irritant animos demissa per aurem,
Quam quæ sunt oculis subjecta fidelibus—

The great object kept steadily in view throughout, has been plainness and clearness of explanation, and this more particularly as applicable to the junior members of the profession; for the Author has not the vanity to suppose he can convey any instruction to those who are adepts in professional knowledge, and to whom it would be more becoming in him to offer himself as the Scholar than as the Preceptor.

R. S.

GUY'S HOSPITAL,
May 1, 1824.

NOMINA SOCIORUM

ET

PERMISSORUM (NOVORUM)

COLLEGII REGALIS MEDICORUM

LONDINENSIS.

SOCII NOVI.

THOMAS CAROLUS MOR-
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Josephus Cope.

Andreas Bain.

Jacobus Tattersall.

Thomas Dunne.

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Johannes Blackall.

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Gulielmus Hen. Williams.

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Eques auratus.✱

Robertus Williams.

Johannes Kidd, *Medicinæ*

Regius Professor, Oxo-
niæ.

Gulielmus Macmichael.

Johannes Haviland, <i>Medi-</i>	Gulielmus King.
<i>cinæ Regius Professor,</i>	Carolus Ludovicus Meryon.
<i>Cantabrigiæ.</i>	Jeremiah Gladwin Cloves,
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Johannes Ranicar Park.	Henricus Herbert Southey,
Gulielmus M. Boyton.	<i>Regis Medicus.</i>
Archibald Billing, <i>Censor.</i>	

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Franciscus Hawkins.	

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Harry Gulielmus Carter.	Eduardus Seymour.
Johannes Spurgin.	

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Thomas M'Whirter.	Thomas Brown.
Johannes Hinds.	Georgius Dent.
Johannes Franciscus Berger.	Gulielmus Mason.

Benjamin Fonseca Outram.	Stephanus Luke.
Gulielmus Bromet.	Jacobus M'Gregor, <i>Eques</i>
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Thomas Jones.	<i>extraordinarius.</i>
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Robertus Gooch.	Gulielmus Silver.
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Matthæus Brydie Cowie.	Georgius Gregory.
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Theodore Gordon.	Henricus Lee.

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Georgius Darling.	Petrus Franciscus Luard.
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Heathfield T. Frampton.	Johannes Mason Good.
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G. H. Weatherhead.	Julius Rucco.
Johannes Armstrong.	Henricus Blegborough.
Jacobus Copland.	Georgius Magrath.
Alex. Philip Wilson Philip.	Ricardus Lewin Pennell.
Gulielmus Rhodes Bernard.	Georgius Haines Jones.
Johannes Jacobus Furnivall.	Fredericus Cobb.
Robertus Masters Kerrison.	Robertus Lee.
Johannes Gogill Leath.	Gulielmus Gairdner.
Augustin Sayer.	Thomas Harrison Burder.
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Ashby Smith.	Carolus Locock.
Johannes Vetch.	Johannes Hawker English,
Robertus Alex. Chermside.	<i>Eques auratus.</i>
Henricus Ronalds.	Georgius Hamilton Roe.
Jacobus Alexander Gordon.	Jacobus Black.
Johannes Webster.	Jacobus Bartlett.
Thomas Southwood Smith.	Johannes Burne.
Jacobus Johnson.	Paris Thomas Dick.
Hannanel de Leon.	Gulielmus Baker.
Roderick Macleod.	Henricus Davis.

PERMISSI EXTRA URBEM.

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Georgius Bellamy.	Fredericus Granger.
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Jacobus Proud Johnson.	David Barry.
Samuel M'Guffog.	Carolus Mogg.
Francisco Romero.	Jacobus Clarke.
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Johannes Carnegie.	David J. H. Dickson.
Robertus Smith.	Henricus Somerville.

INTRODUCTORY REMARKS.

IN the MATERIA MEDICA the *new* articles introduced are the *Acidum aceticum fortius*,* *Antimonii Vitrum*, *Bismuthum*, *Cubebæ Baccæ*, *Helenii Radix*, *Kramerix Radix*, *Lactuca*, *Stramonii Semina et Folia*, *Tiglii Oleum*, and the Seeds of the *Colchicum*, *Conium*, & *Digitalis*.

In the *altered* names we observe, that the old *Cantharis* supplants *Lytta*; that *Arsenicum album* (*Acidum arseniosum*) is introduced for *Arsenici Oxydum*; that the Burdundy Pitch is designated *Pix abietina*, and the common Pitch *Pix nigra*. The undefined *Lapis calcarius* (*Carbonis calcis dura*) is properly called *Marmor Album*.

The *Calumbæ Radix* being now first referred to, as procured from the *Cocculus palmatus*, is simplified by the name of *Calumba*, and the *Pterocarpus Erinacea* is mentioned as the plant from which the *Kino* is obtained.

The only articles *omitted* are the *Aloës vulgaris Extractum*, and *Vinum*;† but several of the Preparations, in which

* Prepared of great purity by Beaufoy and Co. at South Lambeth.

† And yet from the lips of a grave and learned Physician have we oft been delighted to hear, that

“ Wine cures the Gout, the Colic, and the Phthisic,
And it is of all things the very best of Physic.”

a mixture of Rectified Spirit and Water is employed as the *Menstruum*, are still called *Vina*. The solution of the tartarized Antimony in the last Pharmacopœia was called *Liquor*, although it contained *more wine* than water; but at present, when it is directed to be made with the exclusion altogether of wine, it is designated *Vinum Antimonii tartarizati*.

In the Materia Medica we find the *Acidum citricum*, *Magnesiæ Subcarbonas*, and *Potassæ Sulphas*, while *formulae* for their preparation are still retained.

The *Guaiaci Resina* of the Materia Medica, changes to a *Gum-Resin* when employed in the preparations!

The *Poma* of the *Colocynthis* and of the *Elaterium* are called *Pepones*.

PREPARATA ET COMPOSITA. The Benzoic Acid is to be prepared by sublimation, as it always was by the manufacturing Chemist. It will be difficult, we think, to obtain any Citric Acid from the *small* quantities of the materials ordered by the College. The Nitric Acid in distillation, is much more likely to be contaminated with Muriatic Acid (from common salt being occasionally present in the Nitre from which it is procured) than with the Sulphuric Acid; the direction for a second distillation, to remove any accidental impurity from this latter acid, appears therefore almost superfluous, while the other remains unnoticed.

Ammoniæ Subcarbonas, as met with in the Shops, is not so freely soluble as to enable a pint of distilled water to

take up four ounces. When in its perfect state it contains in 100 parts, 56.41 of Carbonic Acid, and 43.59 of Ammonia; but the longer it is kept, the greater is the proportion of Carbonic Acid, and the smaller the proportion of Ammonia which it contains, the alkali gradually escaping into the atmosphere. It has even sometimes been found to contain Carbonic Acid 55.70, Ammonia 26.17, Water 18.13.* The mode of preparing the solution, therefore, appears objectionable, and to be much inferior to the former method of obtaining it from Muriate of Ammonia and a subalkaline salt.†

In making the *Potassæ Carbonas* and *Sodæ Carbonas*, the Subcarbonates may occasionally have their Alkalies saturated by the Carbonic Acid, which flies off in preparing the *Liquor Ammoniac Acetatis*.

The *Liquor Calcis* is now very properly directed to be made with cold Water.

If three ounces of the Muriate of Lime had been dissolved in as much Water as would have yielded *six* fluid ounces of solution, each fluidrachm would then have held half a drachm of the Salt. This observation is applicable to other of the solutions.

* Thompson's Chemistry, vol. 2, page 413, 6th Edition.

† There are said to be two *pungent* Carbonats, one containing $43\frac{1}{2}$ Ammonia, $56\frac{1}{2}$ Carbonic Acid, and the other 30 Alkali, 55 Acid, and 15 Water, which last is the solid salt of the Pharmacopœia; and one *scentless*, having 21.5 Ammonia, 56 Acid, and 22.5 Water.

In making the *Argenti Nitras*, it may be observed, that the Acid of Nitre will still dissolve more Silver than the College direct.

For preparing the *Hydrargyri Sulphuretum nigrum & rubrum*, would not the *washed* Sulphur have been preferable to the common sublimed Sulphur which may contain Sulphuric Acid, and from which the washing is intended to free it?

In the distillation of several of the Waters, viz. those of Cinnamon, Peppermint, Spearmint, and Pennyroyal, we are now directed to employ either the articles, or their Essential Oils; and in the three latter Waters we may still substitute thrice the weight of the fresh herb.

The *Infusum Calumbæ* is made with *double* the quantity of the root. The Infusions of Linseed, of Roses, and of Senna, are severally dignified with the addition of *compositum* to their titles. Many far more compounded preparations are still without this distinction.

The *Extractum Colocynthis compositum* is now prepared with *eight times* the quantity of each ingredient, and to the strained liquor, besides the Aloes and Scammony, *three ounces of hard Soap* are to be added. Submuriate of Quicksilver, which is often, in prescribing, added to this Extract, does not appear to be acted on by the Soda in the Soap, at least no visible change is produced on the Submuriate by a solution of Soap in Spirit.

In the distilled Spirits, those of Cinnamon, Peppermint, Spearmint, Pennyroyal, and Rosemary, are selected to be

prepared from their Essential Oils only, in the others we observe no variation.

A maceration of the Seeds of the Colchicum in the Aromatic Spirit of Ammonia is now first introduced under the title of *Spiritus Colchici ammoniatus*. There is also a *Vinum Colchici* prepared from the fresh root.

In the preparation of the Tinctures, the assistance of a gentle heat is now in all cases dispensed with. The Tinctures of Ginger and of Myrrh are prepared with Rectified Spirit undiluted, and so is the *Tinctura Aloës composita*.

The twelve fluid ounces of Liquor obtained in the preparation of *Æther rectificatus*, are subsequently directed to be shaken with *nine fluid ounces of distilled Water*, after which the supernatant Liquor is to be separated for use.

In purifying Honey in a water bath as directed, great waste of the article will generally be experienced. As the more aqueous parts exhale, the saccharine matter crystallizes on the surface, and this most frequently forms the scum that we are directed to remove. By adding water to the separated portion, and subsequent evaporation, we generally recover the honey in its syrupy state. The best mode of separating the impurity is to add in the first instance, a certain quantity of water, and then to expose the whole to the prescribed heat. Thus the foreign matter, if any, will readily rise to the surface, and admit of being separated, and by continuing the heat, the water added may be all got rid of.

In preparing Syrups it should be recollected, that *thirty ounces of Sugar* will not wholly dissolve in a pint of water,

twenty-nine ounces was the quantity ordered in the older editions of the Pharmacopœia. The proportion of Sugar therefore in the *Syrupus Aurantiorum* will be several ounces more than the infusion can dissolve; there is also too much ordered in the *Syrupus Croci*. In preparing the *Syrupus Sarsaparillæ*, it is not evident why the Sugar is added at so early a period.

The ingredients of the *Confectio aromatica* will be most conveniently kept (omitting the Water) in the form of *powder*. The addition of the Water to the dry articles is useless, and only renders it an inconvenient form for the Apothecary.

The *Confectio Opii* is now to be prepared with the addition of some powder of Tragacanth. This may render the Confection more tenacious, and support the powders in it better when added to Mixtures. We think, however, that it should be kept, omitting the *Common Syrup*, in the form of *powder*. Of such powder *ten grains* would contain *a full grain* of opium, and if wanted in Confection, this could readily be made by mixing the powder with thrice its weight of Syrup. By the drying of the Syrup, the dose of Opium in the Confection is liable to variation.

A powder, into which the *astringent* bark Cinnamon enters, is certainly not judiciously retained in the *Pulvis Aloës compositus*; it is, we observe, properly rejected for Ginger in the *Pilulæ Cambogiæ compositæ*.

As the *Pulvis Cretæ compositus* is often used without Opium, it will be prudent for the Apothecary either to keep this alone, to guard against the serious danger of one being substituted for the other, or at least to let that with Opium

be prepared in very small quantities. On the whole, however, we think it would have been better to have erased the latter from the Pharmacopœia, and to have left the Opium to be added to the other whenever it might have been wanted, remembering that this is in the proportion of *one grain* to *thirty-nine* of the compound Powder.

To form the *Pilulæ Hydrargyri Submuriatis compositæ* into a pilular mass, various substances have been ordered; the Balsam of Copaiba was objectionable, and the Mucilage of Acacia rendered the mass very hard. If the Rectified Spirit now directed be added after the dry ingredients have been *well rubbed* together, the mass will readily form into Pills. The half drachm of the Spirit by weight measures about forty-five minims, and this is the quantity we should employ. The Pills ought only to be formed as they are wanted, and in small quantities, or the dry ingredients may be kept mixed in powder ready for use.

The *Emplastrum Lyttæ* of the late Pharmacopœia was sufficiently *soft* to allow of being spread on leather with the thumb. By diminishing the Lard one half in the present *Emplastrum Cantharidis*, the plaster is rendered *harder*; but can never require the spatula for spreading it to receive a heat above what may be given to it by immersion in boiling water.

In *boiling* the ingredients of the *Emplastrum Cumini* to a proper consistence, as now directed, some of the Essential Oils of the seeds and berries are liable to be driven off, and this with injury to the Plaster.

N.B.—*In the Materia Medica*

N.B.—*In the Materia Medica*

† denotes New Articles.

† New Names.

* Verbal Alterations.

|| Also among the Preparations.

ALTERATIONS AND ADDITIONS

IN THE

MATERIA MEDICA.

† Acidum Aceticum fortius.

Hujus pondus specificum est ad pondus aquæ destillatæ ut 1.046 ad 1.000.

Sodæ Subcarbonatis crystallorum grana 87 a granis 100 hujus acidi saturantur.

|| Acidum citricum.

Crystalli.

Acidum Aceticum è ligno destillatum.

†Antimonii Vitrum.	Antimonii Oxydum sulphuretum vitrifactum.
‡Arsenicum Album.	Acidum arseniosum.
†Bismuthum.	
Calumba.	†Cocculus palmatus. <i>Radix.</i> DE CANDOLLE, <i>Sys. Nat.</i>
Camphora.	Laurus Camphora. <i>Concretum sui generis, sublimatione * paratum.</i>
†Cantharis.	Cantharis vesicatoria. LATREILLE, <i>Gen. Insect.</i>
Cardamomi Semina.	‡Matonia Cardamomum. <i>Semina.</i> SMITH, in <i>Rees Cyclop.</i>
Caricæ Fructus.	Ficus Carica. <i>Fructus exsiccatus.*</i>
Colchici Radix ex †Semina.	Colchicum autumnale. <i>Radix recens et Semina.</i>
Colocynthis Pulpa.	Cucumis Colocynthis. <i>*Peponum pulpa.</i>
Conii Folia et †Semina.	Conium maculatum. <i>Folia et Semina.</i>
†Cubeba.	Piper Cubeba. <i>Baccæ.</i>

Digitalis Folia et † Se- mina:	Digitalis purpurea. <i>Folia et Semina.</i>
Elaterii Pepones.*	Momordica Elaterium. <i>Pepones * recentes.</i>
†Helenii Radix.	Inula Helenium. <i>Radix.</i>
Kino.	†Pterocarpus Erinacea. <i>Extractum.</i>
†Krameriae Radix.	Krameria triandra. <i>Radix.</i> <i>Flor. Peruv.</i>
†Lactuca.	Lactuca sativa.
Magnesiæ Subcarbonas.	Subcarbonas Magnesiæ.
†Marmor album.	Carbonas Calcis dura.
Pix abietina.*	Pinus Abies. <i>Resina præparata.</i>
†Pix nigra.	Pinus sylvestris. <i>Resina præparata so- lida.</i>
Potassæ Sulphas.	Sulphas Potassæ.
†Stramonii Semina et Folia.	Datura Stramonium. <i>Semina et Folia.</i>
†Tiglii Oleum.	Croton Tiglium. <i>Oleum e Seminibus expressum.</i>
Uvæ passæ.	Vitis vinifera. <i>Baccæ exsiccatae,</i>

Digitalis Folio et Radice
 Folio et Semine
 Monarda Plantago
 Pappus & veronica

Helianthus Radix
PICERATA ET COMPACTA
 Pterocarpus Eriocarpus
 Eriocarpus

Krameria Radix
 Krameria triandria
 Radix

Alnus Fructus
ALBA
 Lactuca sativa

Malva sylvestris
 Epithymum plantaginifolium
 Carbonis Calcis dura
 Pinus Abies
 Resina propolis

Pinus sylvestris
 Resina propolis
 Resina propolis
 Resina propolis
 Resina propolis

Resina propolis
 Resina propolis
 Resina propolis
 Resina propolis
 Resina propolis

Resina propolis
 Resina propolis
 Resina propolis
 Resina propolis
 Resina propolis

PRÆPARATA ET COMPOSITA.

ACIDA.

ACIDUM BENZOÏCUM.

R Benzoïni libram ;

Vasi vitreo arenæ imposito Benzoïnum immitte, et calore gradûs 300^{mi} adhibito et paulatim aucto, sublima donec nihil ampliùs ascendat ; quod sublimatum est chartâ bibulâ involutum comprime, ut à parte oleosâ separetur ; dein iterum sublima, calore non ultra gradum 400^m aucto.

ACIDUM MURIATICUM.

Vice Si in ejus &c. lege,

Sodæ Subcarbonatis Crystallorum grana 124 ab hujus acidi granis centum saturantur.

ACIDUM NITRICUM.

Vice Si in ejus &c. lege,

Sodæ Subcarbonatis Crystallorum grana 212 ab
hujus acidi granis centum saturantur.

ACIDUM TARTARICUM.

R Potassæ Supertartratis libras duas cum semisse,
Aquæ destillatæ ferventis congios tres,
Cretæ præparatæ libram,
Acidi sulphurici libram*;

Potassæ Supertartratem coque cum Aquæ destil-
latæ congiis duobus, et adjice paulatim Cretam
præparatam, donec bullulæ non ampliùs excitentur ;
sepone ut subsidat Calcis Tartras ; liquorem effunde,
et Tartratem Calcis Aquâ destillatâ sæpiùs ablue,
donec saporis expers sit. Tum superinfunde
Acidum sulphuricum Aquæ destillatæ ferventis
congio dilutum, et sepone per horas viginti quatuor,
subindè agitans. Liquorem cola, et balneo aquoso
consume ut fiant crystalli.

ALKALIA, ET EORUM SALES.

LIQUOR AMMONIÆ.

℞ Ammoniæ Muriatis uncias octo,
Calcis recentis uncias sex,
Aquæ octarios quatuor;

Calci superinfunde Aquæ octarium; tum vas contege et sepone per horam; dein Ammoniæ Muriatem et reliquam Aquam priùs fervefactam adjice, et vas iterum contege; liquorem postquam refrixerit cola; tum destillent Liquoris Ammoniæ fluidunciæ duodecim in receptaculum cujus calor gradum 50^m non superet.

Liquoris Ammoniæ pondus specificum est ad pondus Aquæ destillatæ ut 0.960 ad 1.000.

POTASSE ACETAS.

℞ Potassæ Subcarbonatis libram,
Acidi acetici fortioris octarios duos,
Aquæ destillatæ ferventis octarios duos;

Acidum cum Aquâ priùs commixtum Potassæ Subcarbonati adjice, donec bullulæ non ampliùs excitentur et cola. Liquorem primò in balneo aquoso consume donec cessaverit ebullitio. Dein

calori gradatim aucto expone, et iterum consume donec pellicula supernatet; pelliculam ablatam super chartam bibulam exsicca. Iterum et sæpiùs consumatur liquor, et pelliculam eodem modo aufer et exsicca.

POTASSE CARBONAS.

R Liquoris Potasse Subcarbonatis congiū ;

Acidum carbonicum per Liquorem Potassæ Subcarbonatis in vase idoneo trans mitte ad plenam saturationem et cola. Vaporet liquor colatus ut fiant crystalli, cavendo ne calor gradum 120^m excedat. Has, effuso liquore, super chartam bibulam exsicca.

Acidum carbonicum facillimè obtinetur e Marmore albo et Acido sulphurico diluto.

SODÆ CARBONAS.

R Sodæ Subcarbonatis libram,
Aquæ destillatæ octarios tres ;

Sodæ Subcarbonatem in Aquâ destillatâ liqua. Dein Acidum carbonicum* per liquorem in vase

* Vide Potassæ Carbonas.

idoneo trans mitte ad plenam saturationem, et se pone ut fiant crystal li. Crystallos chartâ bibulâ involutas et compressas exsicca. Consume liquorem reliquum, cavendo ne calor gradum 120^m excedat, ut iterum prodeant crystal li. Has eodem modo comprime et exsicca.

CALCIS PRÆPARATA.

LIQUOR CALCIS.

R Calcis selibram,

Aquæ destillatæ octarios duodecim ;

Calci Aquam affunde, et simul agita ; tum protinus vas contege, et se pone per horas tres ; dein Liquorem cum Calce superstite in vasis vitreis obturatis serva, et, ubi utendum est, ex limpido Liquore sume.

CALCIS MURIAS.

R Salis qui restat post sublimationem Ammoniæ Subcarbonatis libras duas,

Aquæ octarium ;

Misce et per chartam cola ; vaporet liquor donec Sal exsicce tur. Hunc in vase accuratè obturato serva.

LIQUOR CALCIS MURIATIS

R Calcis Muriatis uncias duas,
Aquæ destillatæ fluiduncias tres ;

Calcis Muriatem in Aquâ liqua ; tum per chartam
cola.

METALLA, ET EORUM SALES.

PRÆPARATA EX ANTIMONIO.

ANTIMONIUM TARTARIZATUM.

R Vitri Antrimonii in pulverem subtilissimum contriti,
Potassæ Supertartratis contritæ, singulorum,
libram,
Aquæ destillatæ ferventis congium ;

Vitrum Antimonii cum Potassæ Supertartrate accuratè misce, et in Aquam destillatam ferventem paulatim conjice, spathâ assiduè movens ; coque per quadrantem horæ, et sepone. Liquorem frigidum cola, et liquorem colatum decoque ut fiant crystalli.

VINUM ANTIMONII TARTARIZATI.

R Antimonii tartarizati scrupulum,
Aquæ destillatæ ferventis fluiduncias octo,
Spiritus rectificati fluiduncias duas ;

Antimonium tartarizatum in Aquâ destillatâ
fervente liqua ; tum liquori colato Spiritum adjice.

PULVIS ANTIMONIALIS.

Misce et conjice in crucibulum latum igne candens, et assiduè move donec vapor conspicuus non ampliùs ascendat. Quod restat in pulverem tere et crucibulo idoneo immitte. Tum ignem subministra et paulatim auge ut candeat per horas duas. Residuum tere ut fiat pulvis subtilissimus.

PRÆPARATUM E BISMUTHO.

BISMUTHI SUBNITRAS.

R Bismuthi unciam,
Acidi nitrici fluidunciam cum semisse,
Aquæ destillatæ octarios tres ;

Aquæ destillatæ fluidrachmas sex cum Acido nitrico misce, et Bismuthum in his liqua ; tum cola. Aquæ quod reliquum est liquori colato

adjice, et sepone ut subsidat pulvis. Deinde effuso liquore supernatante Bismuthi Subnitratem Aquâ destillatâ ablue, et chartâ bibulâ involutam leni calore exsicca.

PRÆPARATA E FERRO.

FERRUM AMMONIATUM.

℞ Ferri Subcarbonatis,
Acidi muriatici,
Ammoniaë Muriatis, singulorum, libram ;

Ferri Subcarbonati superinfunde Acidum muriaticum, et sepone donec bullulae non amplius excitentur. Liquorum per chartam cola, et colatum decoque donec omnis humor consumptus sit. Quod restat cum Ammoniaë Muriate diligenter misce : tum igne acri subjecto protinùs sublima : denique in pulverem tere.

FERRUM TARTARIZATUM.

℞ Ferri libram,
Potassæ Supertartratis contritæ libras duas,
Aquæ destillatæ octarios quinque, vel quantum
satis sit ;

Ferrum et Potassæ supertartratem simul tere, et in vase vitreo patulo cum Aquæ octario per dies viginti aëri expone, quotidie agitans, adjectâ subindè Aquâ destillatâ ut semper humida sint. Dein cum Aquæ destillatæ octariis quatuor coque per quadrantem horæ, et cola. Liquorem balneo aquoso consume donec Ferrum tartarizatum penitùs exsiccatum sit. Hoc in pulverem tere, et vase bene obturato serva.

VINUM FERRI.

R Ferri drachmam,

Potassæ Supertartratis contritæ drachmas sex,

Aquæ destillatæ octarios duos, vel quantum satis sit,

Spiritûs tenuioris fluiduncias viginti ;

Ferrum et Potassæ Supertartratem simul tere, et in vase vitreo patulo cum Aquæ fluidunciâ per hebdomadas sex aëri expone, spathâ quotidie movens, adjectâ subinde Aquâ destillatâ ut semper humida sint. Dein leni calore exsicca, in pulverem tere, et cum Aquæ destillatæ fluidunciis triginta misce. Liquorem cola, et colato Spriritum adjice.

PRÆPARATA EX HYDRARGYRO.

HYDRARGYRUM PURIFICATUM.

Hydrargyrum in retortam ferream infunde, et, igne subjecto, destillet Hydrargyrum purificatum.

HYDRARGYRI SUBMURIAS.

R Hydrargyri purificati *pondere* libras quatuor,
Acidi sulphurici *pondere* uncias triginta,
Sodæ Muriatis libram cum semisse,
Ammoniaë Muriatis uncias octo ;

Hydrargyri libras duas cum Acido sulphurico in vase vitreo coque, donec Hydrargyri Sulphas exsiccata fuerit ; hanc ubi refrixerit cum Hydrargyri libris duabus, in mortario fictili contere ut optimè misceantur. Dein Sodæ Muriatem adjice, et simul tere, donec globuli non ampliùs conspiciantur ; tum sublima. Sublimatum in pulverem subtilissimum contere, per cribrum trans mitte, et cum Ammoniaë Muriate, in Aquæ destillatæ ferventis congio priùs liquefactâ, diligenter misce. Sepone ut subsidat pulvis. Liquorem effunde, et pulverem Aquâ destillatâ fervente sæpiùs ablue, donec Liquore Ammoniaë instillato nihil dejiciatur. Denique fiat pulvis subtilissimus, eodem modo quo Cretam præparari præcepimus.

PLUMBI ACETAS.

R Plumbi Subcarbonatis libram,
Acidi acetici fortioris octarium,
Aquæ destillatæ ferventis octarium cum semisse ;

Misce Acidum cum Aquâ ; his Plumbi Subcarbonatem paulatim adjice, et coque donec Acidum saturetur ; deinde per chartam cola, et, Aquâ consumptâ donec pellicula subnascatur, sepone ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

PRÆPARATA E ZINCO.

ZINCI OXYDUM.

R Zinci Sulphatis libram,
Liquoris Ammonię octarium, vel quantum satis sit,
Aquæ destillatæ octarium ;

Zinci Sulphatem in Aquâ destillatâ liqua, et adjice Liquoris Ammonię quantum satis sit, ut Oxydum Zinci penitùs dejiciatur. Liquore effuso, pulverem Aquâ destillatâ sæpius ablue, et balneo arenæ exsicca.

ZINCI SULPHAS.

R Zinci frustulorum uncias quatuor,
Acidi sulphurici pondere uncias sex,
Aquæ destillatæ octarios quatuor ;

Misce in vase vitreo, et, finitâ effervescentiâ, liquorem per chartam cola ; tum decoque, donec pellicula subnascatur, et sepone, ut fiant crystalli.

GUMMI-RESINÆ.

Gummi-resinæ si minus puræ esse videantur, coque in Aquâ, donec mollescant, et prelo exprime per pannum cannabinum ; dein sepone, ut pars resinosa subsidat. Liquorem supernatantem effusam balneo aquoso consume, adjectâ sub finem parte resinosâ, ut cum parte gummosâ in unum coëat.

OLEA DESTILLATA.

OLEUM ANISI,
 ANTHEMIDIS,
 CARUI,
 JUNIPERI,
 LAVANDULÆ,
 MENTHÆ PIPERITÆ,
 MENTHÆ VIRIDIS,
 ORIGANI,
 PIMENTÆ,
 PULEGII,
 ROSMARINI.

Anisi et Carui Semina, Anthemidis et Lavandulæ Flores, Juniperi et Pimentæ Baccæ, Rosmarini Cacumina, et reliquorum Herbæ recentes, adhibenda sunt.

AQUÆ DESTILLATÆ.

AQUA CINNAMOMI.

R Cinnamomi Corticis contusi libram, vel
 Olei Cinnamomi *pondere* scrupulos quinque ;

Oleo, vel Cortici in Aquâ per horas quatuor et viginti macerato, affunde tantum Aquæ ut post destillationem supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Eodem modo destillet Congius

AQUÆ MENTHÆ PIPERITÆ *ex*

Menthæ piperitæ exsiccatae librâ cum semisse, vel
Olei Menthæ piperitæ *pondere* drachmis tribus ;

AQUÆ MENTHÆ VIRIDIS *ex*

Menthæ viridis exsiccatae librâ cum semisse,
vel

Olei Menthæ viridis *pondere* drachmis tribus ; et

AQUÆ PULEGII *ex*

Pulegii exsiccati librâ cum semisse, vel
Olei Pulegii *pondere* drachmis tribus.

INFUSUM CALUMBÆ.

R Calumbæ drachmas duas,
Aquæ ferventis octarium dimidium ;

Macera per horas duas, in vase levitèr clauso, et
cola.

EXTRACTA.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM

℞ Colocyinthidis Pulpæ concisæ uncias sex,
 Aloës spicatae Extracti contriti uncias duodecim,
 Scammoneæ Gummi-resinæ contritæ uncias quatuor,
 Cardamomi Seminum contritorum unciam,
 Saponis duri uncias tres,
 Spiritûs tenuioris congiûm ;

Macera Colocyinthidis Pulpam in Spiritu, leni calore, per quatrîdium. Lîquorem cola, eîque ad-jice Aloën, Scammoneam, et Saponem ; dein Spiritum consume, donec idoneam crassitudinem habeat, et, sub finem, Cardamomi Semina admisce.

EXTRACTUM LACTUCÆ.

℞ Lactucæ foliorum recentium libram ;

Contunde in mortario lapideo, insperso exiguo Aquæ : dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.

EXTRACTUM STRAMONII.

R Stramonii Seminum libram,
Aquæ ferventis congium ;

Macera per horas quatuor in vase levitèr clauso prope ignem : dein Semina exime, et contunde in mortario lapideo : contusa liquori redde. Tum decoque ad octarios quatuor, et liquorem adhuc calentem cola. Denique eum consume, donec idoneam crassitudinem habeat.

MISTURA FERRI COMPOSITA.

Myrrham cum Spiritu Myristicæ et Posassæ Subcarbonate simul tere, hisque, inter terendum, primùm Aquam Rosæ cum Saccharo, deinde Ferri Sulphatem adjice.

SPIRITUS.

SPIRITUS COLCHICI AMMONIATUS.

R Colchici Seminum contusorum uncias duas,
Spiritus Ammoniaë aromatici octarium ;

Macera per dies quatuordecim et cola.

SPIRITUS CINNAMOMI.

R Olei Cinnamomi *pondere* scrupulos quinque,
Spiritus rectificati octarios quatuor cum semisse ;

Oleo Spiritum adjice, et tantum Aquæ affunde,
ut post destillationem supersit quod satis sit ad
prohibendum empyreuma : tum lento igne destillet
congius.

EODEM MODO DESTILLET CONGIUS

SPIRITUS MENTHÆ PIPERITÆ *ex*

Olei Menthæ piperitæ *pondere* scrupulis sex cum
semisse ;

SPIRITUS MENTHÆ VIRIDIS *ex*

Olei Menthæ viridis *pondere* scrupulis sex cum
semisse ; *et*

SPIRITUS PULEGII *ex*

Olei Pulegii *pondere* scrupulis septem.

SPIRITUS ROSMARINI.

R Olei Rosmarini *pondere* unciam,
Spiritus rectificati congium ;

Oleo Spiritum adjice, et tantum Aquæ affunde,

ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

TINCTURÆ.

TINCTURA ALOËS.

Macera per dies quatuordecim, et cola.

TINCTURA MYRRHÆ.

R Myrrhæ contusæ uncias quatuor,

Spiritûs rectificati octarios tres;

Macera per dies quatuordecim, et cola.

TINCTURA ZINGIBERIS.

R Zingiberis Radicis concisæ uncias duas,

Spiritûs rectificati octarios duos;

Macera per dies quatuordecim, et cola.

ÆTHER RECTIFICATUS.

— fluidunciæ duodecim; destillatum cum Aquæ fluidunciis novem simul agita, et sepone ut subsidat Aqua. Denique Ætherem rectificatum supernatantem affunde, et vase bene obturato conserva.

VINUM ALOËS.

R Aloës spicatæ Extracti uncias octo,
Canellæ Corticis uncias duas,
Spiritus tenuioris,
Aquæ destillatæ, singulorum octarios quatuor ;

Aloën cum arenâ albâ, sordibus purgatâ, in pulverem tere ; Canellæ Corticem etiam in pulverem tere ; hisque, inter se mistis, Spiritum et Aquam affunde. Macera per dies quatuordecim, subinde movens, et cola.

VINUM COLCHICI.

R Colchici Radicis recentis concisæ libram,
Spiritus tenuioris fluiduncias quatuor,
Aquæ destillatæ fluiduncias octo ;

Macera per dies quatuordecim, et cola.

VINUM IPECACUANHÆ.

R Ipecacuanhæ Radicis contusæ uncias duas,
Spiritus tenuioris fluiduncias duodecim,
Aquæ destillatæ fluiduncias viginti ;

Macera per dies quatuordecim, et cola.

VINUM OPII.

- ℞ Extracti Opii unciam,
Cinnamomi Corticis contusi,
Caryophyllorum contusorum, singulorum drach-
mam,
Spiritus tenuioris fluiduncias sex,
Aquæ destillatæ fluiduncias decem ;
Macerate per dies octo, et cola.

VINUM VERATRI.

- ℞ Veratri Radicis concisæ uncias octo,
Spiritus tenuioris octarium,
Aquæ destillatæ octarium cum semisse ;
Macerate per dies quatuordecim, et cola.
-

ACETUM COLCHICI.

—macerate per dies tres ; dein exprime—

SYRUPUS SARSAPARILLÆ.

- ℞ Sarsaparillæ Radicis concisæ libram,
Aquæ ferventis congium,
Sacchari purificati libram ;
Macerate Radicem in Aquâ per horas viginti

quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; dein adjice Saccharum, et ad idoneam crassitudinem consume.

CONFECTIO OPII.

Adde insuper cæteris

Tragacanthæ contritæ drachmas duas.

CONFECTIO PIPERIS NIGRI.

R Piperis nigri,

Helenii Radicis, singulorum libram,

Fœniculi Seminum libras tres,

Mellis,

Sacchari purificati, singulorum libras duas;

Arida simul in pulverem subtilissimum tere; dein, adjecto Melle, contunde, donec corpus unum sit.

PILULÆ CAMBOGIÆ COMPOSITÆ.

R Cambogiæ contritæ drachmam,

Aloës spicatæ Extracti contriti drachmam cum semisse,

Zingiberis *Radicis contriti* drachmam dimidiam,

Saponis *duri* drachmas duas;

Misce inter se pulveres; dein, adjecto Sapone, omnia simul contunde, donec corpus unum sit.

PILULÆ HYDRARGYRI SUBMURIATIS
COMPOSITÆ.

Pro adjice Mucilaginis Acaciæ quod satis sit, *lege*
Spiritus rectificati drachmam dimidiam.

EMPLASTRUM CUMINI.

Pici et Ceræ simul liquefactis arida in pulverem trita, Olivæ Olei et Aquæ, singulorum fluidunciam cum semisse adjice ; tum ad idoneam crassitudinem decoque.

EMPLASTRUM CANTHARIDIS.

R Cantharidis in pulverem subtilissimum tritæ
libram,

Emplastri Ceræ libram cum semisse ;

Adipis præparatæ libram dimidiam ;

Emplastro et Adipi simul liquefactis, et ab igne remotis, paulo antequam concrecant, Cantharidem insperge, atque omnia misce.

EMPLASTRUM OPII.

Emplastro Plumbi liquefacto Abietis Resinam, Opium, et Aquæ Octarium dimidium adjice, et lento igne decoque, donec omnia in emplastri crassitudinem coëant.

EMPLASTRUM PICIS COMPOSITUM

Pici, Resinæ, et Ceræ, simul liquefactis, primùm Abietis Resinam, dein Olivæ Olei et Aquæ, singulorum fluiduncias duas, et Oleum Myristicæ adjice. Denique omnia misce, et ad idoneam crassitudinem decoque.

EMPLASTRUM PICIS COMPOSITUM

Pici, Resinae, et Cerae, singulis tincturis, primum
 Abietis Resinam, deinde Oleum Olivae et Aquam, singulis
 tum fluidioribus, deinde, et Oleum, singulis, adijce.
 Denique omnia trice, et ad idoniam consistentiam
 decupe.

OSTENSIO, quod resinae, et cerae, singulis, primum

trahantur, deinde, et Oleum, singulis, adijce.

trahantur, deinde, et Oleum, singulis, adijce.

trahantur, deinde, et Oleum, singulis, adijce.

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trahantur, deinde, et Oleum, singulis, adijce.

trahantur, deinde, et Oleum, singulis, adijce.

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NOMINUM NOVORUM,

OSTENDENS AD QUOD PRIORIS PHARMACOPŒIÆ
NOMEN QUODQUE PERTINET.

NOMINA NOVA.

NOMINA PRIORA.

A.

Acidum aceticum dilutum

—— arseniosum

Arsenicum album.

—— sublimatum.

Acidum aceticum.

Oxydum Arsenici album

Arsenici Oxydum.

—— sublimatum.

C.

Calumba.

Cantharis.

Cantharis vesicatoria.

Ceratum Cantharidis.

—— Plumbi Acetatis.

Cucumis Colocynthis, *Pepo-*
*num pulpa.*Calumbæ *Radix.*

Lytta.

Lytta vesicatoria.

Ceratum Lyttæ.

—— Plumbi Superacetatis.

Cucumis Colocynthis, *Pomo-*
rum pulpa.

E.

Elaterii *Pepones.*

Emplastrum Cantharidis.

Elaterii *Poma.*

Emplastrum Lyttæ.

NOMINA NOVA.

NOMINA PRIORA.

I.

Infusum Lini compositum.	Infusum Lini.
——— Rosæ compositum.	——— Rosæ.
——— Sennæ compositum.	——— Sennæ.

M.

Magnesiae Subcarbonas.	Magnesiae Carbonas.
Marmor album.	Lapis calcarius.
Matonia Cardamomum.	Elettaria Cardamomum.

P.

Pix abietina.	Pix arida.
——— nigra.	Resina nigra.
Plumbi Acetas.	Plumbi Superacetas.

T.

Tinctura Cantharidis.	Tinctura Lyttæ.
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V. U.

Vinum Antimonii tartarizati.	Liquor Antimonii tartarizati.
Unguentum Cantharidis.	Unguentum Lyttæ.
——— Picis nigræ.	——— Resinæ nigræ.

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NOMINUM PRIORUM,

OSTENDENS AD QUOD PHARMACOPEIÆ MDCCCXXIV
NOMEN QUODQUE PERTINET.

NOMINA PRIORA.

NOMINA NOVA.

A.

Acidum aceticum.

Acidum aceticum dilutum.

Arsenici Oxydum.

Arsenicum album.

———— sublimatum.

Arsenicum album sublima-
tum

C.

Calumbæ *Radix*.

Calumba.

Ceratum Lyttæ.

Ceratum Cantharidis.

———— Plumbi Superaceta-
tis.

———— Plumbi Acetatis.

Cucumis Colocynthis, *Pomo-
rum pulpa*.

Cucumis Colocynthis, *Pepo-
num pulpa*.

E.

Elaterii *Poma*.

Elaterii *Pepones*.

Elettaria Cardamomum.

Matonia Cardamomum.

Emplastrum Lyttæ.

Emplastrum Cantharidis.

NOMINA PRIORA.

NOMINA NOVA.

I.

Infusum Lini.

——— Rosæ.

——— Sennæ.

Infusum Lini compositum.

——— Rosæ compositum.

——— Sennæ compositum.

L.

Lapis calcarius.

Liquor Antimonii tartarizati.

Lytta.

Lytta vesicatoria.

Marmor album.

Vinum Antimonii tartarizati.

Cantharis.

Cantharis vesicatoria

M.

Magnesiæ Carbonas.

Magnesiæ Subcarbonas.

O.

Oxydum Arsenici album.

Acidum arseniosum.

P.

Pix arida.

Plumbi Superacetas.

Pix abietina.

Plumbi Acetas.

R.

Resina nigra.

Pix nigra.

T.

Tinctura Lyttæ.

Tinctura Cantharidis.

U.

Unguentum Lyttæ.

——— Resinæ nigræ.

Unguentum Cantharidis.

——— Picis nigræ.

SCHEMES

ILLUSTRATIVE

OF CHEMICAL

Composition and Decomposition.

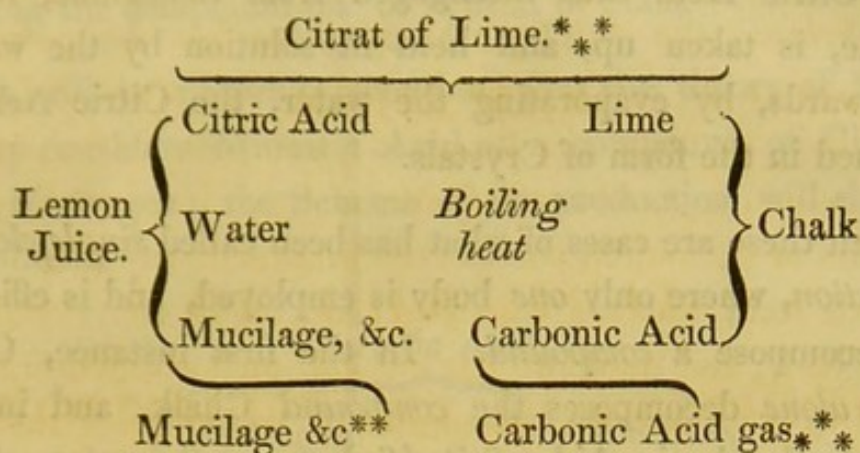
To understand the following *Schemes*, it should be recollected that the *vertical* brackets $\{ \}$ denote all the bodies originally employed or elicited to produce the subsequent results, and that the horizontal ones \frown point out all the new products of the chemical agency, after the vertical ones have been brought or mixed together. Single or simple bodies have no vertical bracket, but *half an horizontal* one shews that the product is *pharmaceutically* regarded as a simple body. Thus in the first part of the fourth *Scheme*, the Carbonic Acid of the compound Chalk, embraced by the vertical bracket on the right hand, and the Potass, part of the compound Cream of Tartar, also embraced by the left hand vertical bracket, unite, and produce the Subcarbonat of Potass, which stands above the upper horizontal bracket; and to shew that this newly formed salt is *soluble*, the middle point of the bracket is turned *upwards*. And again, the Lime of one side, and the Tartaric Acid of the other, form also a new compound, the Tartrat of Lime, which is under a bracket having its middle point turned

downwards, and we are hence to infer, that the Salt is *insoluble*, or that it *precipitates*. In the second process of the same *Scheme*, the Sulphuric Acid alone has the power of decomposing the newly formed compound Tartrat of Lime; and taking to itself the Lime, it forms with it Sulphat of Lime, which is *fixed* or *insoluble*, and this is denoted by the direction of the middle point of the bracket downwards. The Tartaric Acid, thus set loose from the Lime, is considered as a simple body, and therefore has but *half* an horizontal bracket, which, to point out the suspension or solubility of the acid in water, has its inner point directed upwards. And so of all the rest, which a little practice will render very intelligible: still, however, as more explanatory of the result,

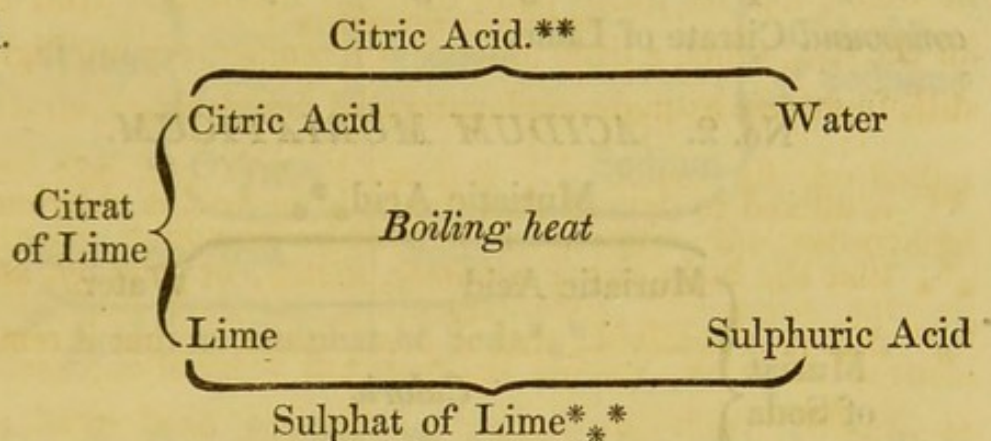
- ** is affixed to denote that the body is *held in solution*,
- ** that the body either *sublimes*, *distils*, or *flies off*, and
- ** that it is *insoluble*, that it *precipitates*, or that it remains *fixed*.

No. 1. *ACIDUM CITRICUM.*

1st.



2nd.



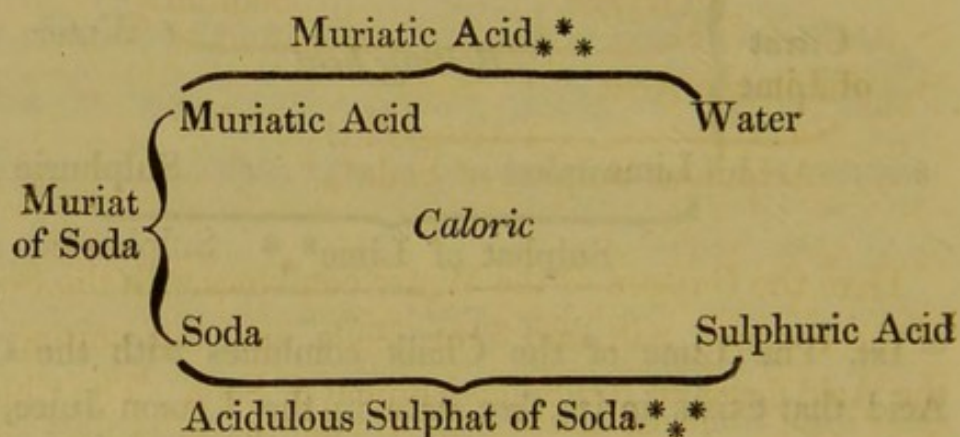
1st. The Lime of the Chalk combines with the Citric Acid that exists in its free state in the Lemon Juice, and produces a Citrat of Lime, the insolubility of which salt is denoted by the position of the stars. The Carbonic Acid, when detached from its base the Lime, by the superior attraction which the Citric Acid has for Lime, having nothing to detain it, rises in bubbles through the liquor, and escapes in the form of *Gas*. The repeated washings are intended to remove from the Citrat of Lime all the Mucilage, Extractive, or other matter that originally existed in the Lemon Juice.

2ndly. The Sulphuric Acid, having a stronger attraction for Lime than the Citric Acid has, decomposes the Citrat

of Lime, forming with the Lime an insoluble compound. The Citric Acid thus disengaged from the Lime, being soluble, is taken up, and held in solution by the water. Afterwards, by evaporating the water, the Citric Acid is obtained in the form of Crystals.

Both these are cases of what has been called *single elective attraction*, where only *one* body is employed, and is efficient to decompose a *compound*. In the first instance, Citric Acid *alone* decomposes the *compound* Chalk, and in the second, Sulphuric Acid *of itself* destroys the union of the *compound* Citrate of Lime.

No. 2. *ACIDUM MURIATICUM.*

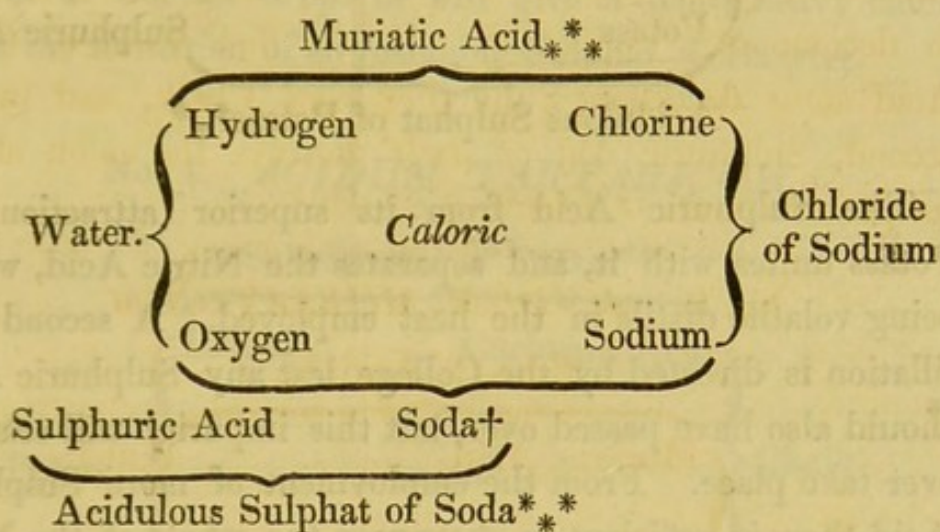


In its natural state Muriatic Acid is gaseous (Muriatic Acid Gas.) In this process, by superior affinity, the Sulphuric Acid unites with the Soda of the Muriat of Soda, (common Salt) and the Muriatic Acid is set at liberty. Thus the product may be regarded as the Acid Gas condensed in water. The mass which remains fixed in the retort, is an acidulous salt, employed in the preparation of the *Sodæ Sulphas* by saturating its excess of Acid by Soda.

The above Scheme is also a case of single elective attrac-

tion, where one body, Sulphuric Acid, is capable of decomposing the compound one of Muriat of Soda.

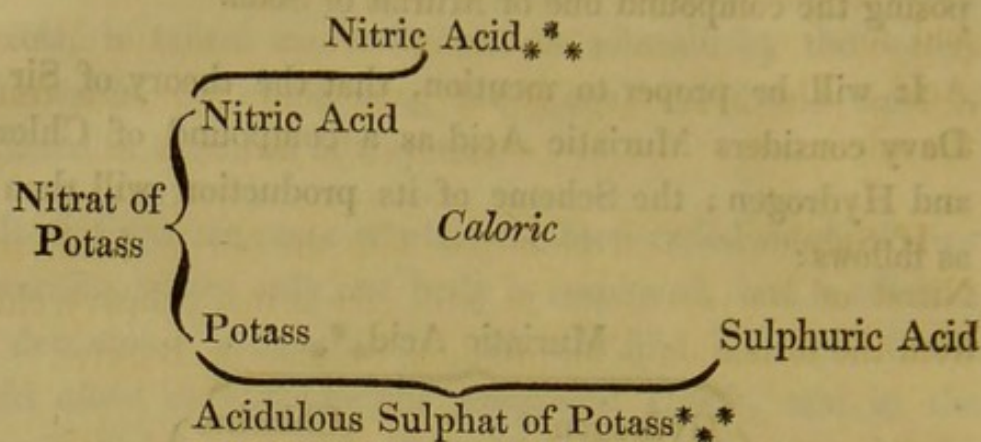
It will be proper to mention, that the theory of Sir H. Davy considers Muriatic Acid as a compound of Chlorine and Hydrogen; the Scheme of its production will then be as follows:



Here the Oxygen of the Water combines with the Sodium of the common Salt and forms Soda, and this uniting with the Acid forms an Acidulous Sulphat of Soda. The Chlorine deserted by the Sodium, unites with the Hydrogen of the decomposed Water, and this, with the remaining Water, constitutes the Acid[‡] in question.

† Soda, instead of being a simple body or element, is compounded of the Metal Sodium and Oxygen, in the proportion of about 100 parts by weight of Sodium to 33 of Oxygen. The specific weight of Sodium is to Water as .972 to 1.000.

‡ Called by Gay Lussac Hydrochloric Acid. Its component parts are stated to be equal volumes of Hydrogen and of Chlorine Gasses, or by weight 1 of Hydrogen to 36 of Chlorine.

No. 3. *ACIDUM NITRICUM.*

The Sulphuric Acid from its superior attraction for Potass unites with it, and separates the Nitric Acid, which being volatile distils in the heat employed. A second distillation is directed by the College lest any Sulphuric Acid should also have passed over, but this impurity will scarcely ever take place. From the employment of more Sulphuric Acid than is sufficient to disengage the whole of the Nitric Acid, an acidulous salt (as in the preparation of Muriatic Acid) is left, which dissolved and crystallized, forms the *Potassæ Supersulphas*; it also forms the *Potassæ Sulphas* by having the superabundant† Acid saturated with Potass.

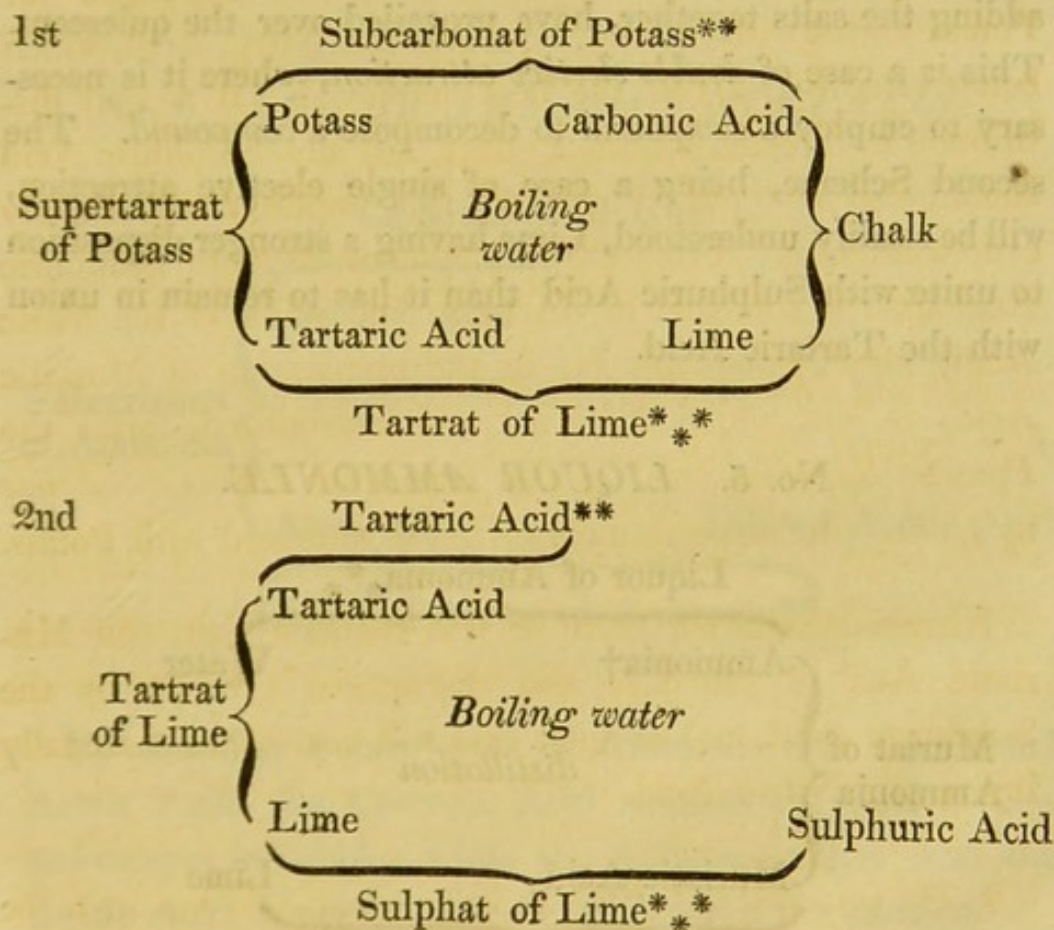
Nitre may contain more or less common Salt, the Muriatic Acid of which is also disengaged (No. 2) by the Sulphuric Acid, and in such case will sometimes materially injure the Nitric Acid.

† The principal use of the Superabundant Acid appears to be to contribute a sufficient portion of Water to preserve the constitution of the Nitric Acid, which consists of 79.7 Acid, and 20.3 Water. The Acid is composed of nearly 26 Azote and 74 Oxygen, or of 1 volume of Azote and $2\frac{1}{2}$ volumes of Oxygen.

The Muriatic Acid can be effectually separated by Nitrat of Silver, the oxyde of the Metal leaving the Nitric Acid, and forming a dense cloud by its union with the Muriatic Acid. The appearance of this precipitate is a sure test of the admixture of the Muriatic with the Nitric Acid.

If Sulphuric Acid be mixed with the Nitric Acid, some Nitrat of Barytes dropt in will give a dense heavy cloud, from the formation of an insoluble Sulphat of Barytes.

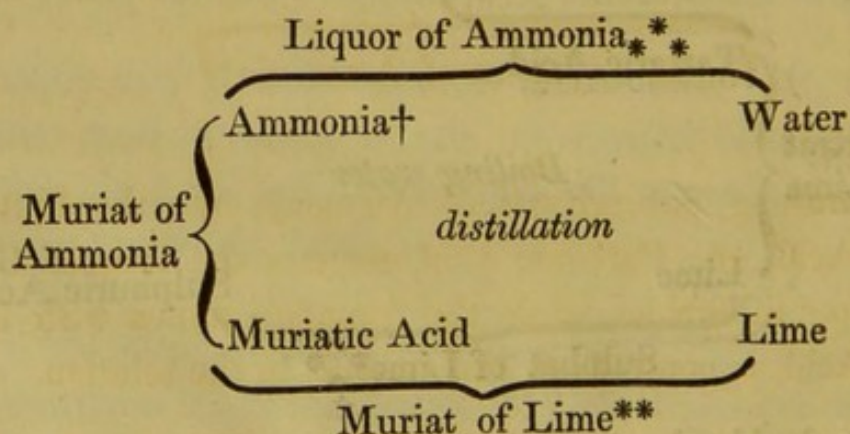
No. 4. *ACIDUM TARTARICUM.*



Here a double decomposition first takes place, the Lime of the Chalk forming with the Tartaric Acid an insoluble compound, and the Carbonic Acid going over to the Potass.

Whereas Lime singly would not separate the Tartaric Acid, neither would Carbonic Acid alone detach Potass from Tartaric Acid; by employing their united energy in the form of Chalk, the *divellent* affinities, or those which tend to disturb or tear asunder the union of the bodies we employ, prevail over the *quiescent* affinities, or those powers which tend to keep them united. Thus the union of Potass and Tartaric Acid, and again of the Lime and Carbonic Acid are instances of quiescent affinities, but the subsequent union of the Lime and Tartaric Acid, and of the Carbonic Acid and Potass are, on the contrary, proofs that the *divellent* affinities, on adding the salts together, have prevailed over the quiescent. This is a case of *double elective attraction*, where it is necessary to employ a *compound* to decompose a *compound*. The second Scheme, being a case of single elective attraction, will be readily understood, Lime having a stronger disposition to unite with Sulphuric Acid than it has to remain in union with the Tartaric Acid.

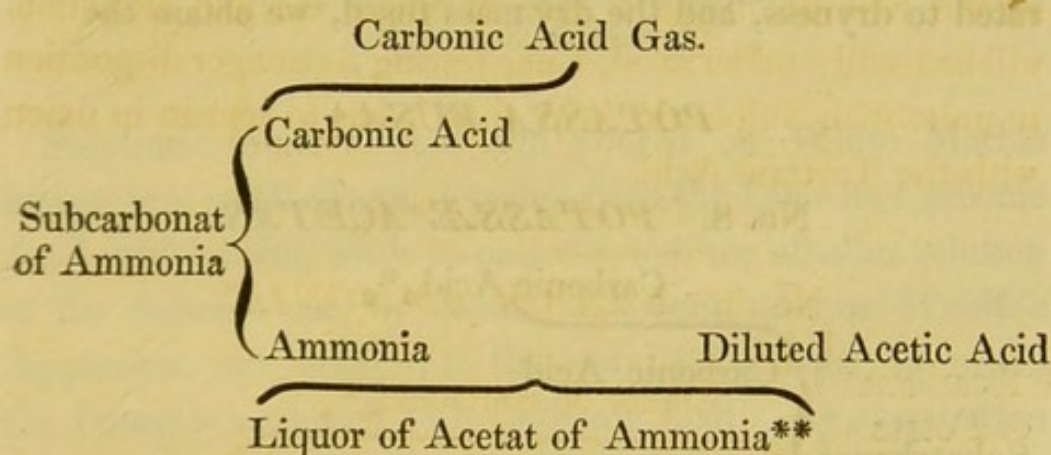
No. 5. *LIQUOR AMMONIÆ.*



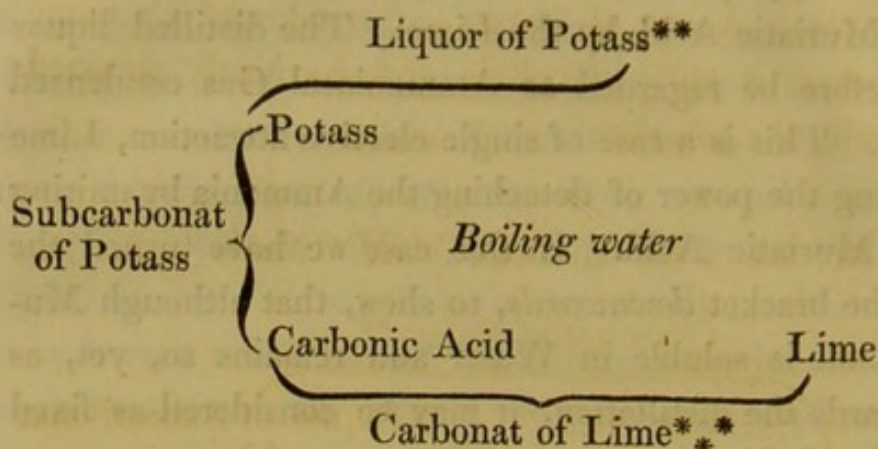
† Appears to consist of 3 volumes of Hydrogen and 1 volume of Azote.

Pure Ammonia in its *natural state is gaseous*, but the Water here employed absorbs it as quickly as it is separated from the Muriatic Acid by the Lime. The distilled liquor may therefore be regarded as Ammoniacal Gas condensed in Water. This is a case of single elective attraction, Lime *alone* having the power of detaching the Ammonia by uniting with the Muriatic Acid. In this case we have turned the point of the bracket *downwards*, to shew, that although Muriate of Lime is soluble in Water and remains so, yet, as far as regards the distillation, it may be considered as fixed or remaining behind.

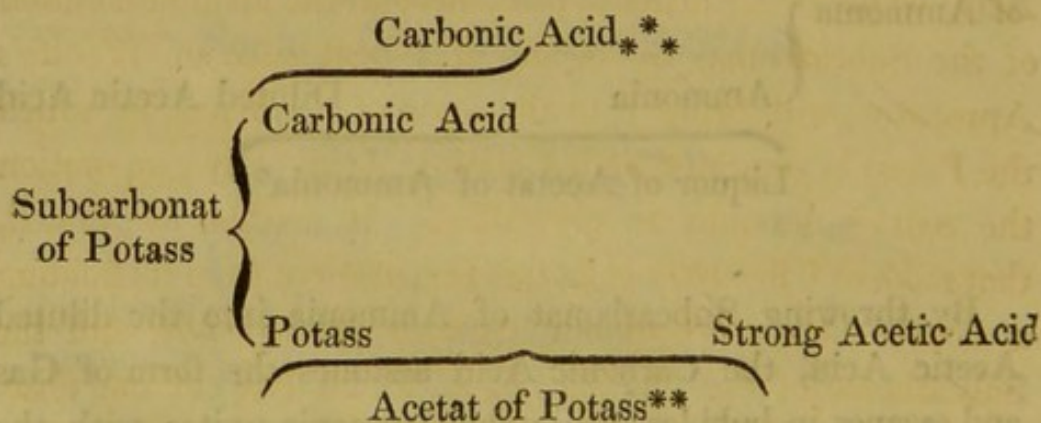
No. 6. *LIQUOR AMMONIÆ ACETATIS.*



By throwing Subcarbonat of Ammonia into the diluted Acetic Acid, the Carbonic Acid assumes the form of Gas and escapes in bubbles, while the Ammonia unites with the Acetic Acid, is neutralized, and remains in the solution.

No. 7. *LIQUOR POTASSÆ.*

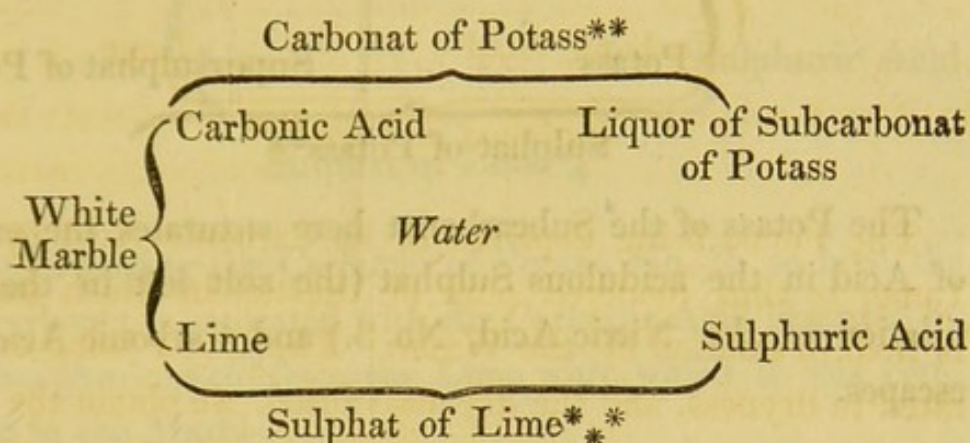
The Potass being deprived of its Carbonic Acid by the Lime, is thus rendered pure or caustic, in which state it is held in solution by the Water. The Liquor being evaporated to dryness, and the dry mass fused, we obtain the

POTASSA FUSA.†No. 8. *POTASSÆ ACETAS.*

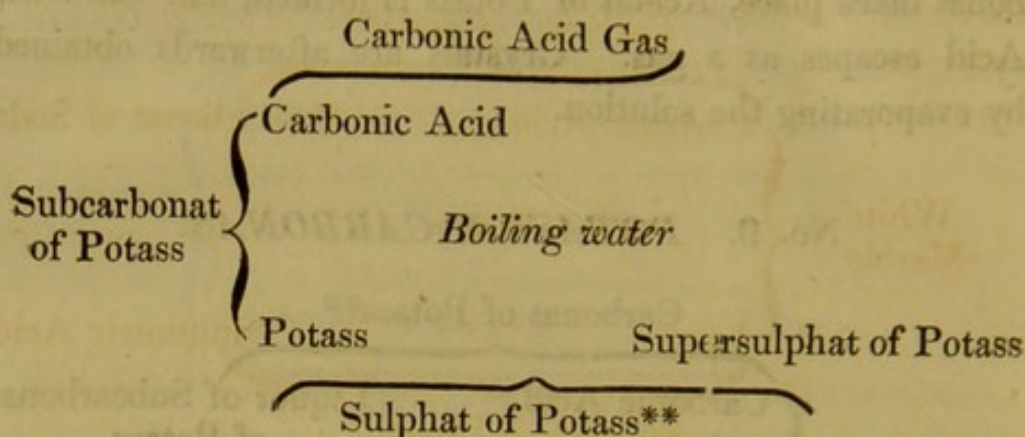
† Potass, as well as Soda, must no longer be regarded as an Element, or simple body. It has been decomposed and shewn to consist of the Metal Potassium 100 parts to 20 of Oxygen. In specific gravity the Metal is to Water as about .85 to 100.

The Acetic Acid having a stronger attraction for Potass, Carbonic Acid has for it, a disunion of the Subcarbonat takes place, Acetat of Potass is formed, and Carbonic Acid escapes as a gas. Crystals are afterwards obtained evaporating the solution.

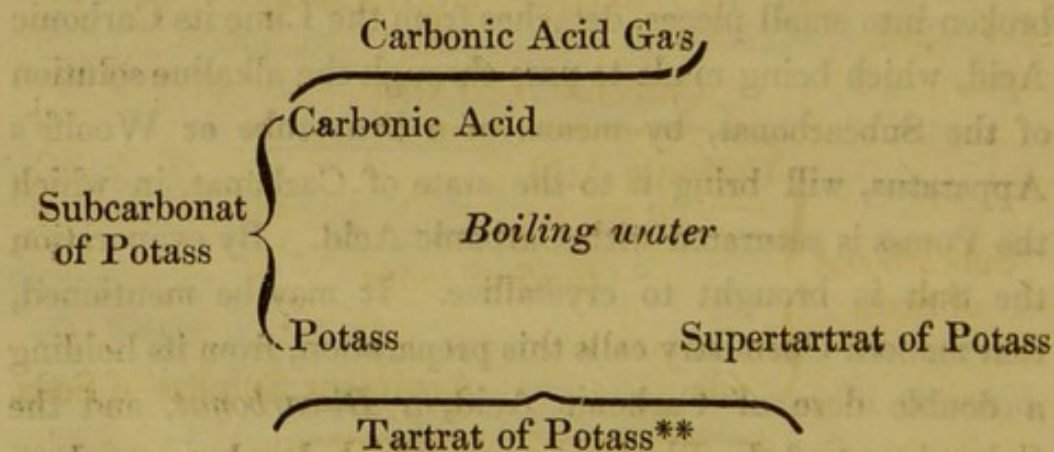
No. 9. *POTASSÆ CARBONAS.*



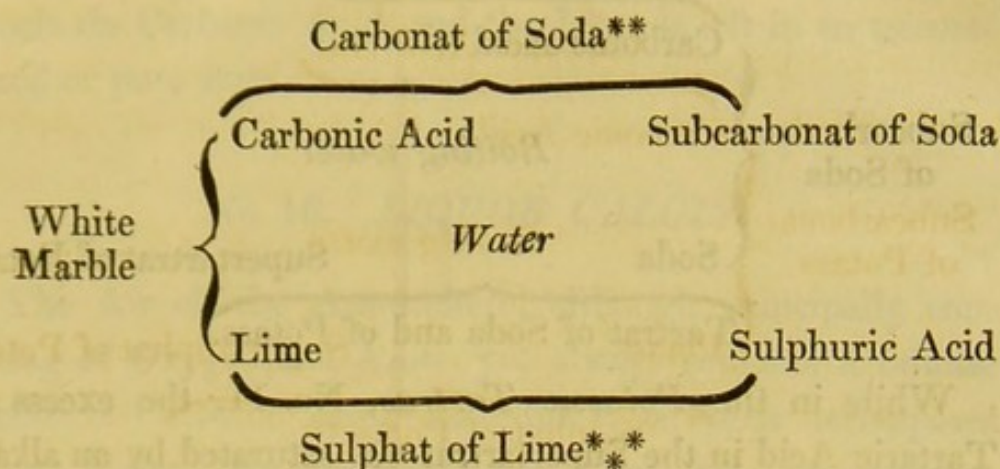
Sulphuric Acid diluted and poured on White Marble broken into small pieces, detaches from the Lime its Carbonic Acid, which being made to pass through the alkaline solution of the Subcarbonat, by means of a bent tube or Woolfe's Apparatus, will bring it to the state of Carbonat, in which the Potass is saturated with Carbonic Acid. By evaporation the Salt is brought to crystallize. It may be mentioned, that modern Chemistry calls this preparation, from its holding a double dose of Carbonic Acid, a *Bi-carbonat*, and the Subcarbonat of the Pharmacopœia, which has but one dose, a *Carbonat*. This second dose of Carbonic Acid is very loosely attached, and by a little increase of heat is got rid of, and the salt is reduced to its minor state of union with the Acid; but this minor dose of Carbonic Acid is not separable even at a red heat.

No. 10. *POTASSÆ SULPHAS.*

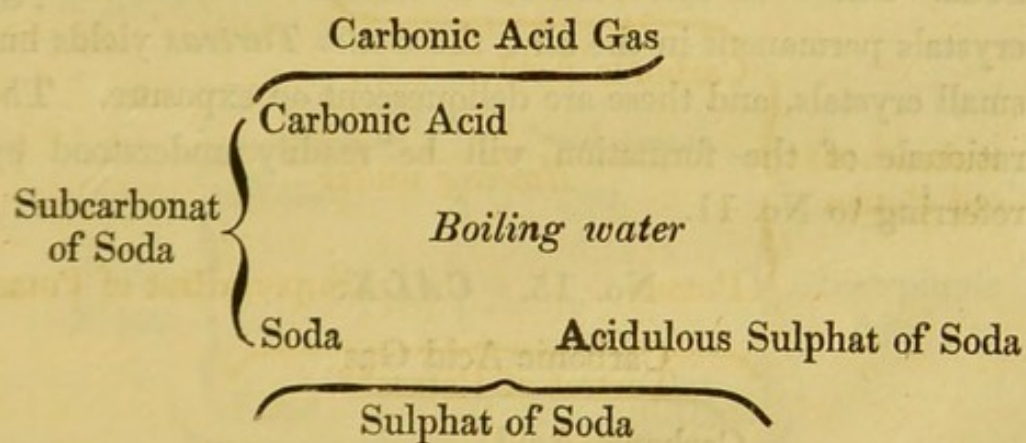
The Potass of the Subcarbonat here saturates the excess of Acid in the acidulous Sulphat (the salt left in the distillation of the Nitric Acid, No. 3.) and Carbonic Acid gas escapes.

No. 11. *POTASSÆ TARTRAS.*

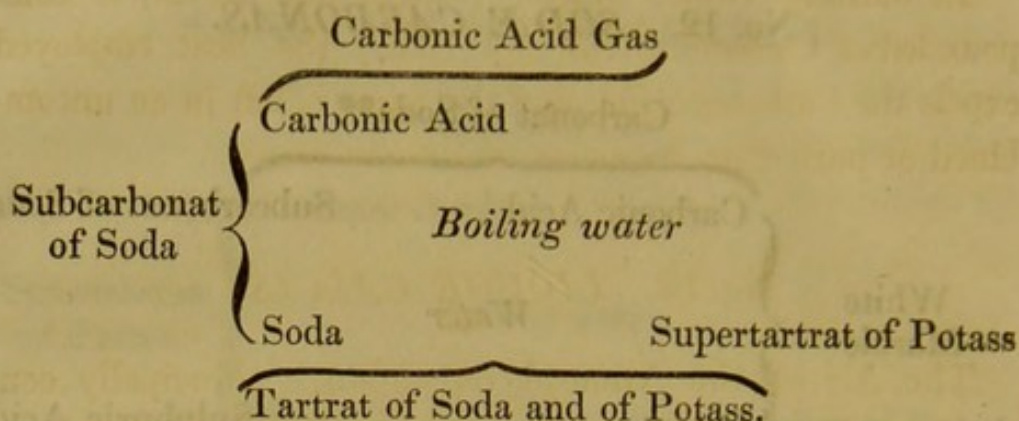
The excess of Acid in the Supertartrat of Potass (Cream of Tartar) is here saturated by a *base similar to its own*, namely, Potass, and left in solution; while the Carbonic Acid quitting the Potass, and having nothing to detain it, flies off in the gaseous form, as in similar cases.

No. 12. *SODÆ CARBONAS.*

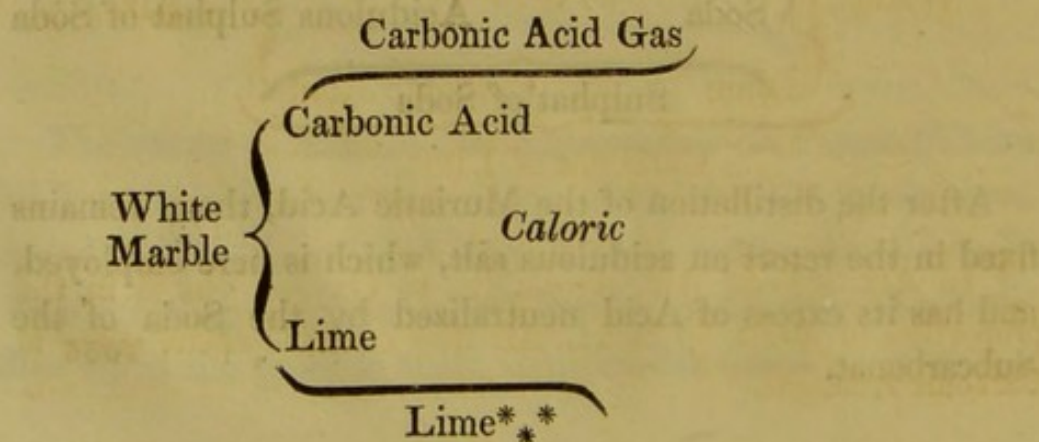
As in making the Carbonat of Potass, No. 9, so here the Subcarbonat is saturated with the Carbonic Acid liberated by the Sulphuric Acid from the Lime with which it was combined in the Marble.

No. 13. *SODÆ SULPHAS.*

After the distillation of the Muriatic Acid, there remains fixed in the retort an acidulous salt, which is here employed, and has its excess of Acid neutralized by the Soda of the Subcarbonat.

No. 14. *SODA TARTARIZATA.*

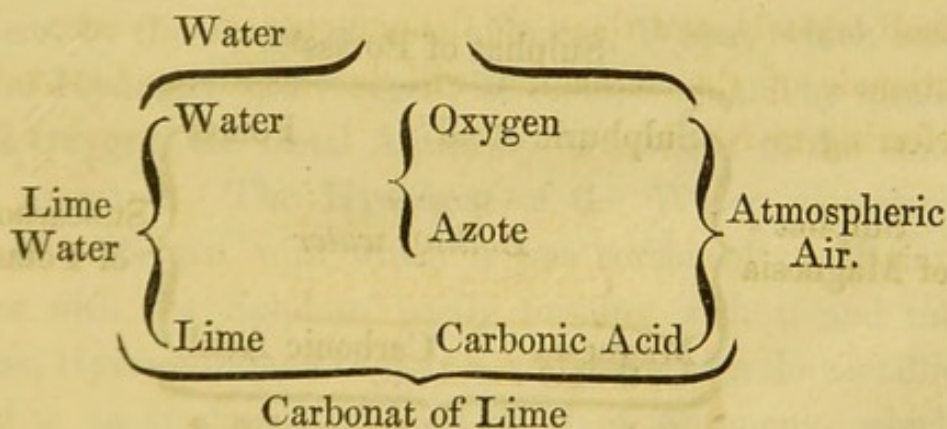
While in the *Potassæ Tartras*, No. 11, the excess of Tartaric Acid in the Supertartrat was saturated by an alkali, or *base similar* to the one entering into its composition, namely, Potass; here on the contrary the alkali employed for a similar purpose is a *different* one, namely, Soda; and this difference in the two salts is worthy of being remembered, the one, *Potassæ Tartras*, being a salt with a single base, while the *Soda tartarizata* is what is called a triple salt, composed of Tartaric Acid with bases both of Potass and of Soda. The *Soda tartarizata*, or Rochelle salt, forms large crystals permanent in the air; the *Sodæ Tartras* yields but small crystals, and these are deliquescent on exposure. The rationale of the formation will be readily understood by referring to No. 11.

No. 15. *CALX.*

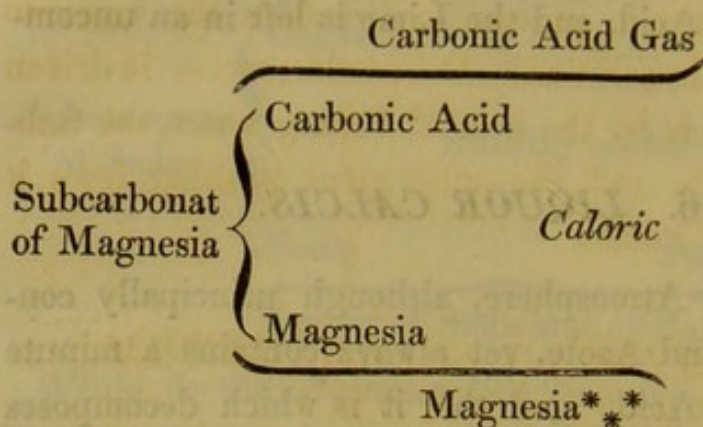
In burning White Marble (which, like Chalk, is compounded of Carbonic Acid and Lime) the heat employed expels the Carbonic Acid, and the Lime is left in an uncombined or pure state.

No. 16. *LIQUOR CALCIS.*

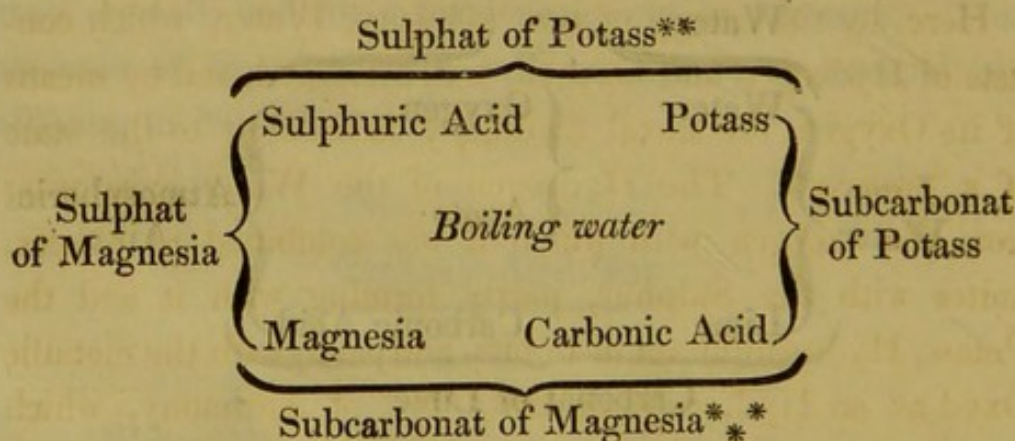
The Air of the Atmosphere, although principally consisting of Oxygen and Azote, yet always contains a minute portion of Carbonic Acid,* and this it is which decomposes Lime Water, by separating the Lime held in solution, and forming with it a Carbonat of Lime, which is an insoluble compound. It is this combination therefore that occasions the film observed on the surface of *Liquor Calcis*, if this be exposed but for a short time to the air. The Liquor is ordered to be kept constantly over the Cream of Lime, that the Water may be always saturated with the Lime. The following Scheme will shew the action of Air on the Liquor.



* In Atmospheric Air, Azotic gas to Oxygen gas is in the proportion of about 79 to 21. Air also contains about $\frac{1}{1000}$ of Carbonic Acid gas.

No. 17. *MAGNESIA.*

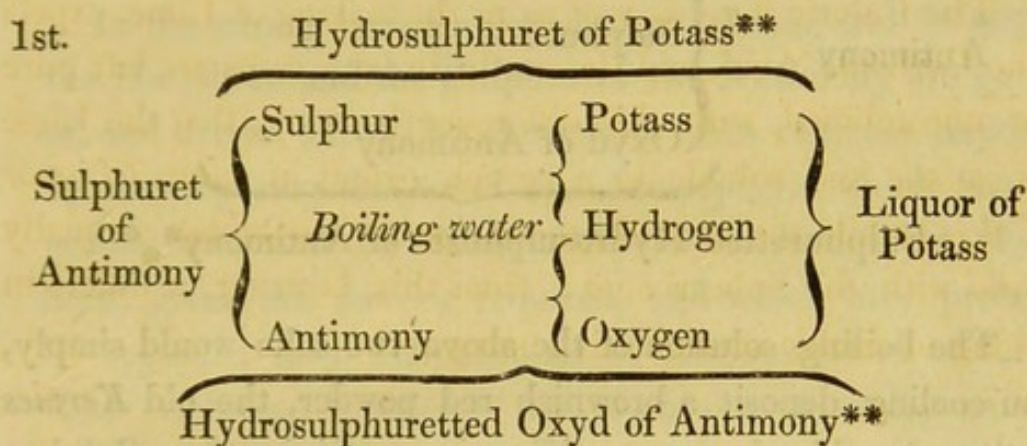
The Caloric here, as well as in the making of Lime, expels the Carbonic Acid, and the earths in both cases are left pure or uncombined, with this difference however, that the Lime is *caustic* and soluble to a certain extent in water, (*Liquor Calcis*) while the pure Magnesia (nearly insoluble) is equally *mild* with the Subcarbonat; from this, however, it differs in being of double strength as a purgative.

No. 18. *MAGNESIÆ SUBCARBONAS.*

In this case of double affinity, the Sulphuric Acid combining with Potass liberates the Carbonic Acid, which, when liberated, rushes into union with the Magnesia, and forms

the Subcarbonat. The Liquor is boiled after the salts have been added to each other, to get rid of some *superabundant* Carbonic Acid, which is present and enables the water to hold the Magnesia in solution. When this excess is driven off, which it readily is by the heat of boiling water, the Subcarbonat precipitates, and the subsequent washing frees it from the Sulphat of Potass.

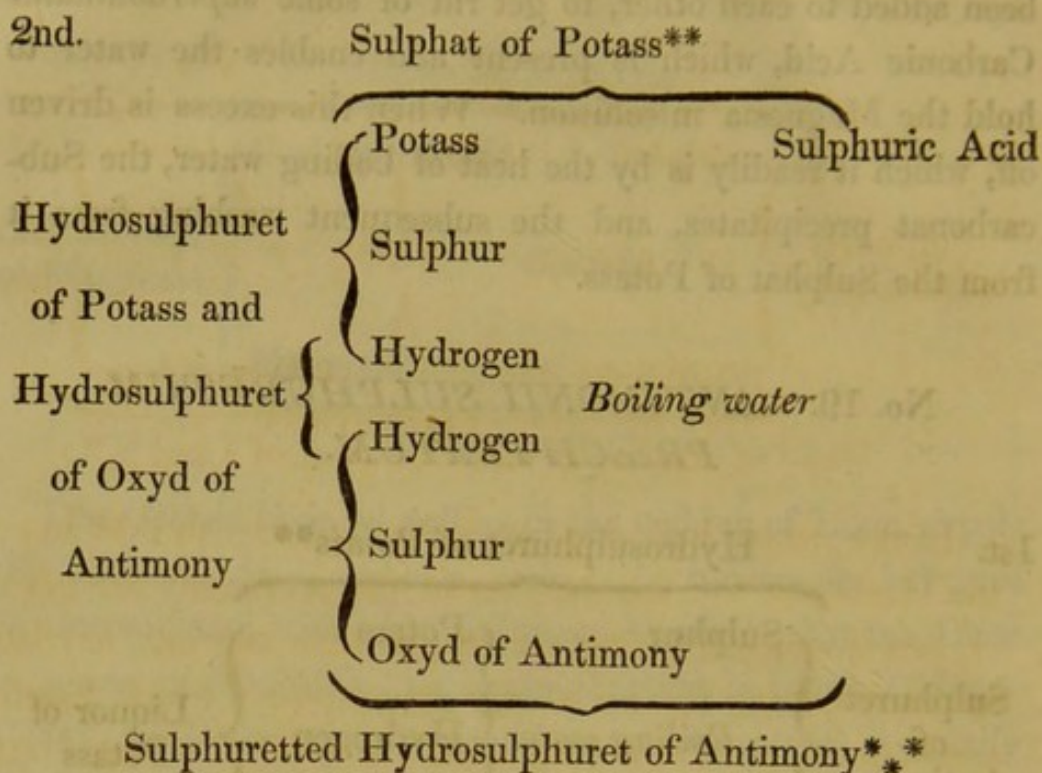
No. 19. *ANTIMONII SULPHURETUM
PRÆCIPITATUM.*



Here, by the energy of new affinities, Water, which consists of Hydrogen and Oxygen, is decomposed, and by means of its Oxygen, the metal Antimony is brought to the state of a protoxyd. The Hydrogen of the Water separating from the Oxygen with which it was combined as Water, unites with the Sulphur, partly forming with it and the Potass, Hydrosulphuret of Potass, and partly with the metallic Oxyd as an Hydrosulphuretted Oxyd of Antimony, which combinations are both soluble in boiling Water,† then

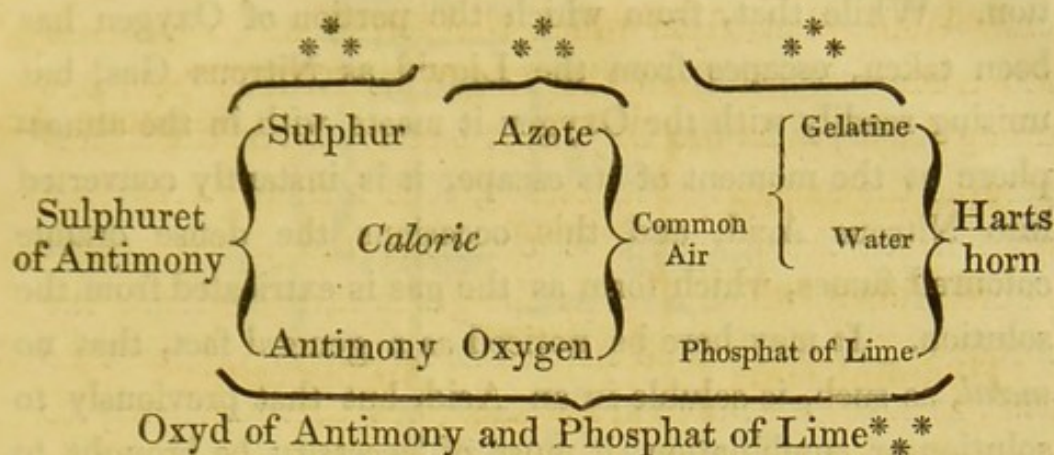
† This complicated result may be also explained thus: by boiling Sulphuret of Antimony with Liquor of Potass, a Sul-



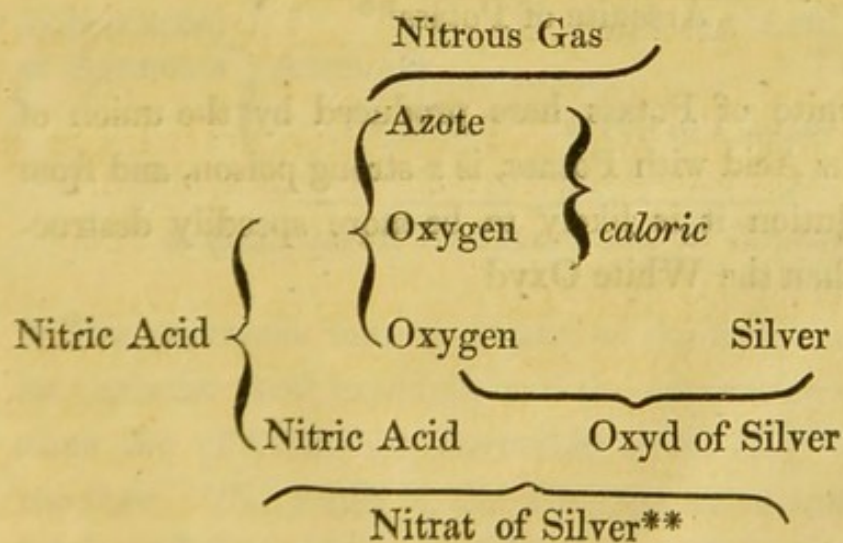


The boiling solution of the above two salts would simply, on cooling, deposit a brownish red powder, the old *Kermes mineral*; this, however, differs in containing less Sulphur than the precipitated Sulphuret, in which the Sulphur that has combined with the Potass and Hydrogen, is also detached by the agency of the Sulphuric Acid, and precipitates at the same time and together with the other natural deposit. On the addition of the Acid some sulphuretted Hydrogen gas flies off.

phuret of Potass is formed, and this acting on the Water, which is a compound of Oxygen and Hydrogen, attracts its Hydrogen and becomes a Sulphuretted Hydrosulphuret, and in this state it unites with the Antimony, which has been oxydated by the Oxygen of the decomposed Water, and has also combined with a portion of the Hydrogen forming an Hydrosulphuretted Oxyd.

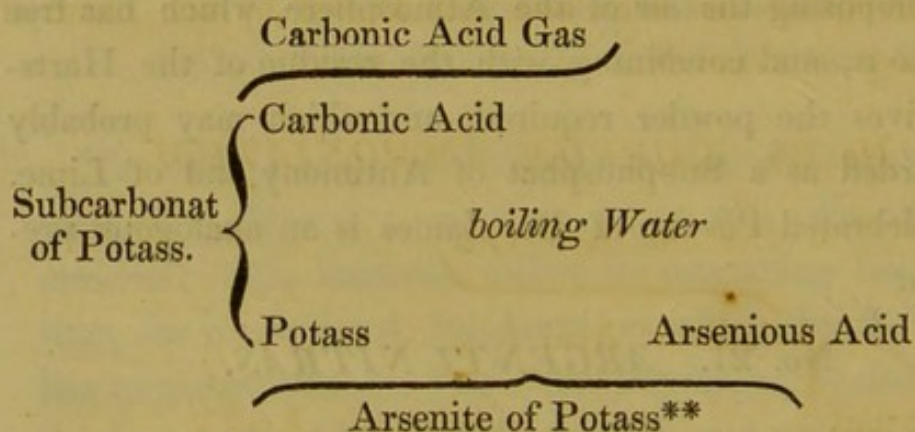
No. 20. *PULVIS ANTIMONIALIS.*

In the strong heat employed, the Gelatine and Water of the Hartshorn and the Sulphur of the Antimony are got rid of, and driven off. The Antimony then becomes oxydated by decomposing the air of the Atmosphere, which has free access to it, and combining with the residue of the Hartshorn, gives the powder required, and which may probably be regarded as a Subphosphat of Antimony and of Lime. The celebrated Powder of Dr. James is an analogous preparation.

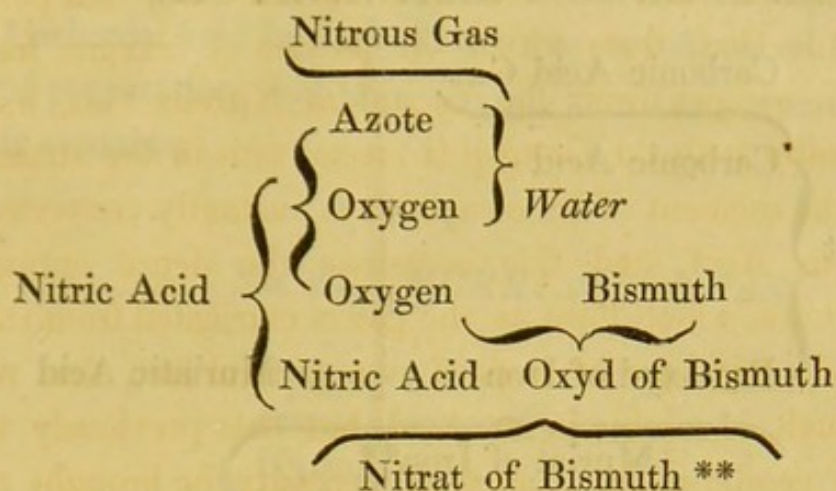
No. 21. *ARGENTI NITRAS.*

Silver decomposing one portion of Nitric Acid becomes oxydated, and is then dissolved in some undecomposed portion. While that, from which the portion of Oxygen has been taken, escapes from the Liquid as Nitrous Gas, but uniting readily with the Oxygen it meets with in the atmosphere at the moment of its escape, it is instantly converted into Nitrous Acid, and this occasions the dense orange coloured fumes, which form as the gas is extricated from the solution. It may here be noticed as a general fact, that no *metal*, as such, is soluble in an Acid, but that previously to solution or combination, it must of necessity be brought to the state of *Oxyd*.

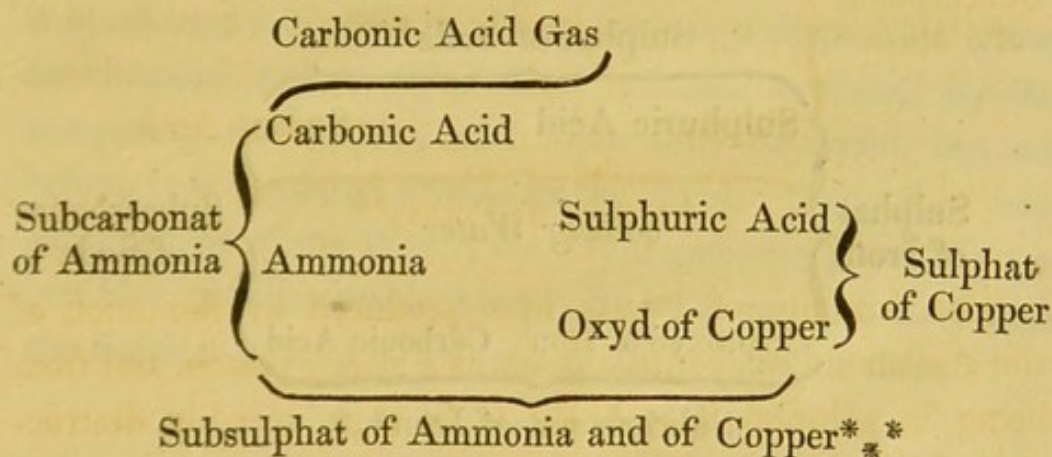
No. 22. *LIQUOR ARSENICALIS.*



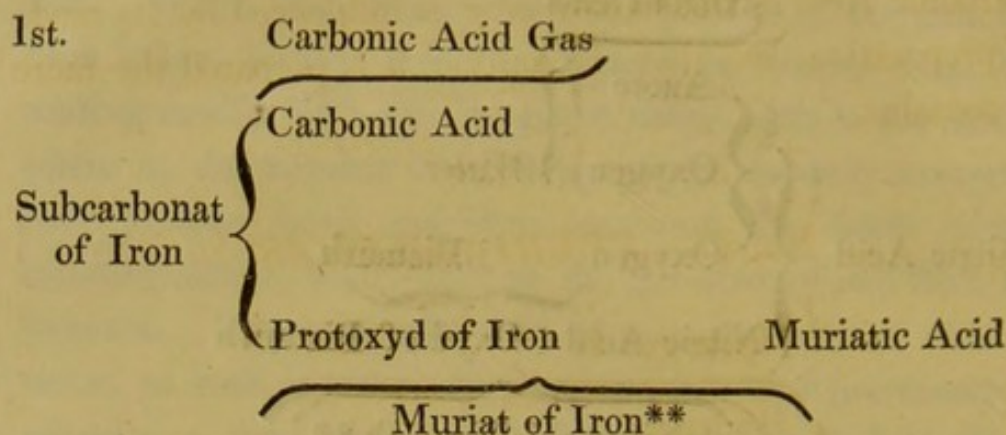
The Arsenite of Potass here produced by the union of the Arsenious Acid with Potass, is a strong poison, and from being in solution it is likely to be more speedily destructive of life than the White Oxyd

No. 23. *BISMUTHI SUBNITRAS.*

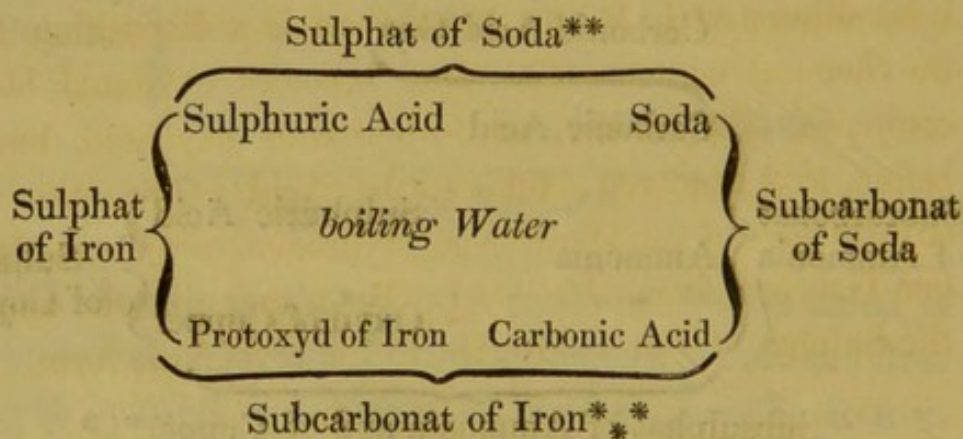
Water being added to the strained solution decomposes Nitrat of Bismuth, deprives the salt of a portion of its Acid, and then a Subnitrat, according to Bucholz, precipitates. This white precipitate has been long well known by the name of Magistery of Bismuth.

No. 24. *CUPRUM AMMONIATUM.*

The Ammonia uniting to part of the Sulphuric Acid has its Carbonic Acid expelled, and the extrication of this occasions the effervescence observable on rubbing the two salts together. The result is, the *Cuprum ammoniatum* or Subsulphat of Ammonia and of Copper.

No. 25. *FERRUM AMMONIATUM.*

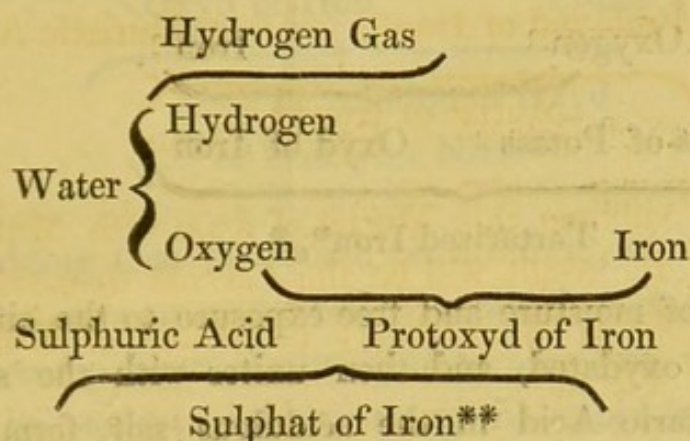
2nd. Dry and sublime this Muriat of Iron with Muriat of Ammonia, and the result will be the *Ferrum ammoniatum*, which most probably is a ternary compound of Muriat of Ammonia and of Iron.

No. 26. *FERRI SUBCARBONAS.*

Here the Soda combines with the Sulphuric Acid, and the Carbonic Acid, as it is liberated from the Alkali, goes over to, and precipitates with the Protoxyd of Iron. The precipitate at first is of a light bluish green colour, and remains so while moist. In drying the colour changes, probably

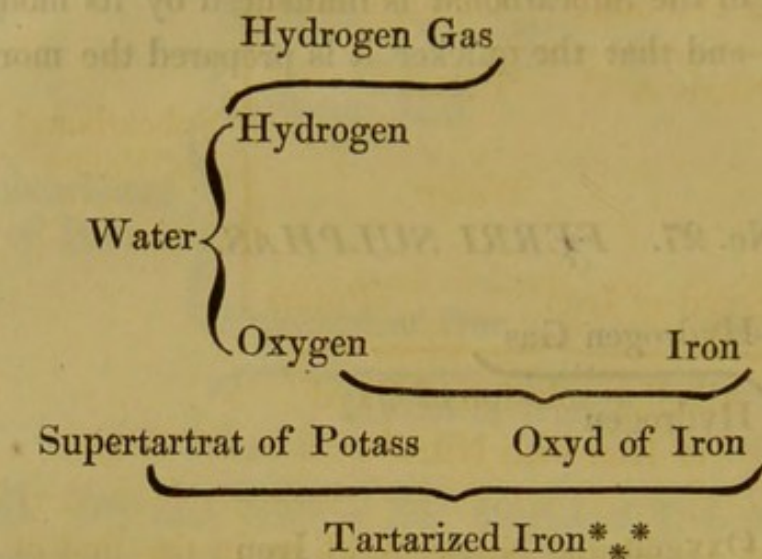
from the absorption of Oxygen; and finally it acquires a reddish brown colour. It is said, that the proportion of Carbonic Acid in the Subcarbonat is influenced by its mode of preparation, and that the quicker it is prepared the more it contains.

No. 27. *FERRI SULPHAS.*

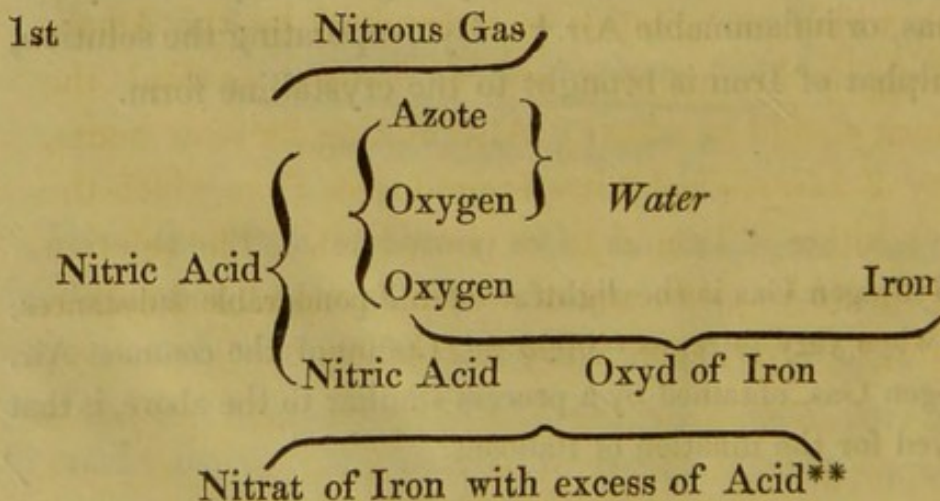


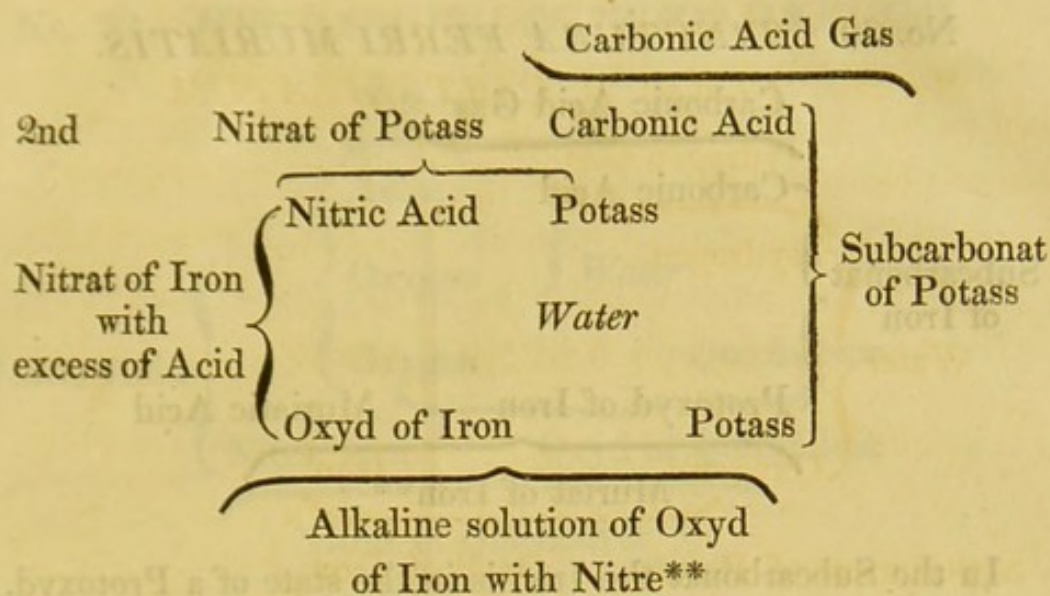
The *strong* Sulphuric Acid has no action on Iron, but if it be diluted with Water, then there is a disposition given for chemical action. The Iron becomes oxydated by decomposing the Water, and when thus oxydated, but not before, it is rendered soluble in the Acid. The other constituent part of the Water, viz. Hydrogen, escapes as Hydrogen Gas, or inflammable Air.† By evaporating the solution, the Sulphat of Iron is brought to the crystalline form.

† Hydrogen Gas is the lightest of all ponderable substances, being when very pure as 0.0693 to 1.0000 of the common Air. Hydrogen Gas, obtained by a process similiar to the above, is that employed for the inflation of Balloons.

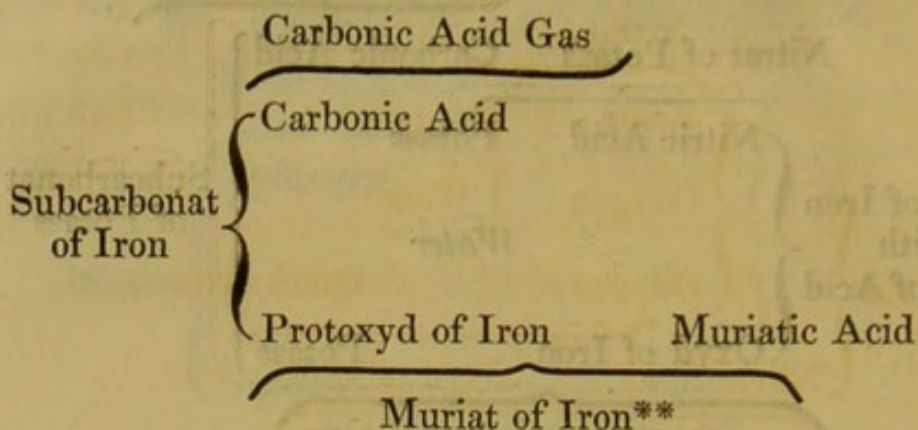
No. 28. *FERRUM TARTARIZATUM.*

By the aid of moisture and free exposure to the air, the Iron becomes oxydated, and then unites with the superabundant Tartaric Acid in the acidulous salt, forming a compound of Tartrat of Iron and of Potass. The *Ferrum tartarizatum* is then dissolved by boiling the mass in Water, and the filtered Liquor evaporated, till the Salt be thoroughly dried.

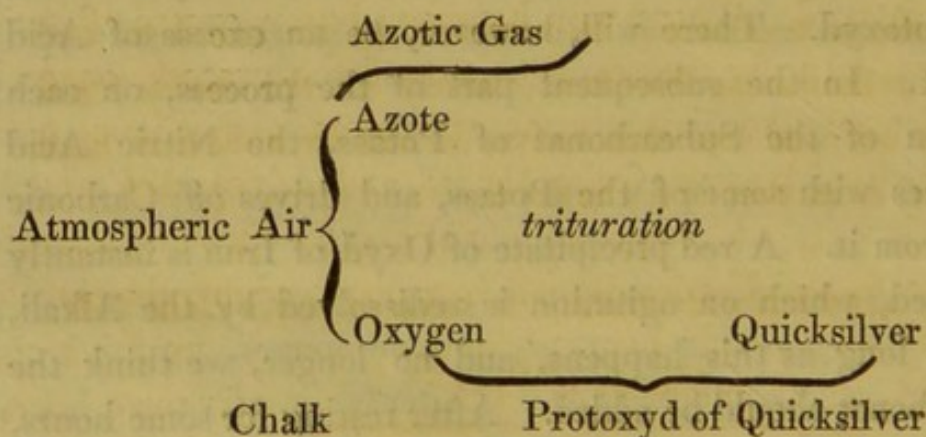
No. 29. *LIQUOR FERRI ALKALINI.*



By adding Iron to diluted Nitric Acid, as in the first of the above processes, a violent action is induced from the rapid decomposition of the Acid by the Iron. This action should be moderated by plunging the vessel in cold water, and thus the solution, when finished, will be of a pale green colour, in which the Iron is at its *minimum* of oxydizement, *i. e.* protoxyd. There will, however, be an excess of Acid present. In the subsequent part of the process, on each addition of the Subcarbonat of Potass, the Nitric Acid combines with some of the Potass, and drives off Carbonic Acid from it. A red precipitate of Oxyd of Iron is instantly produced, which on agitation is redissolved by the Alkali, and as long as this happens, and no longer, we think the Subcarbonat should be added. After resting for some hours, a quantity of crystallized Nitre is produced, from which the Alkaline solution of Iron is to be poured off. The solution or liquor should be clear, and of a deep brownish red colour. It contains, however, some Nitre in solution.

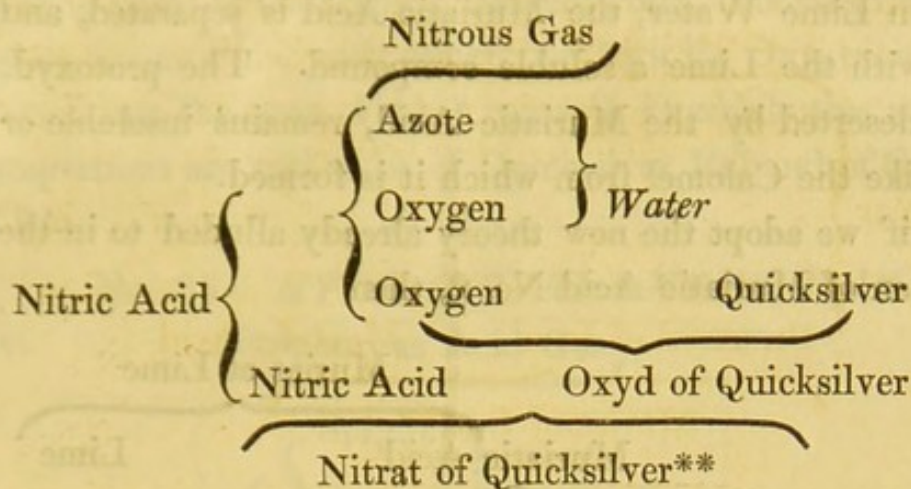
No. 30. *TINCTURA FERRI MURIATIS.*

In the Subcarbonat the Iron is in the state of a Protoxyd. It is readily decomposed by the Muriatic Acid, which expels the Carbonic Acid; and the Iron, becoming still farther oxydated, is converted into the red or per-oxyd, and dissolves in the Muriatic Acid. This solution is afterwards largely diluted by the addition of Rectified Spirit.

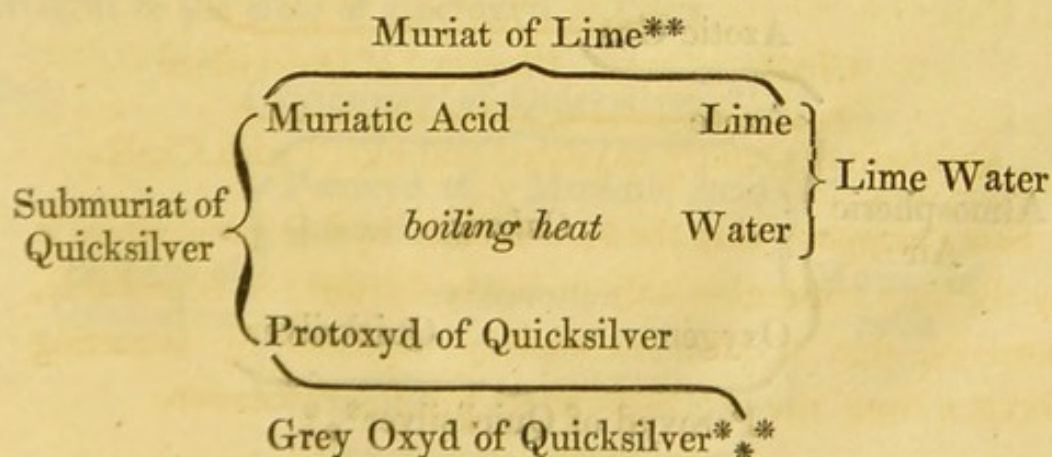
No. 31. *HYDRARGYRUM CUM CRETA.*

Quicksilver slightly oxydated and mixed with Chalk.

Some suppose that the Quicksilver in this preparation is by the long trituration only minutely divided; it is probable, however, that it becomes slightly oxydated by attracting Oxygen from the Atmosphere during the trituration.

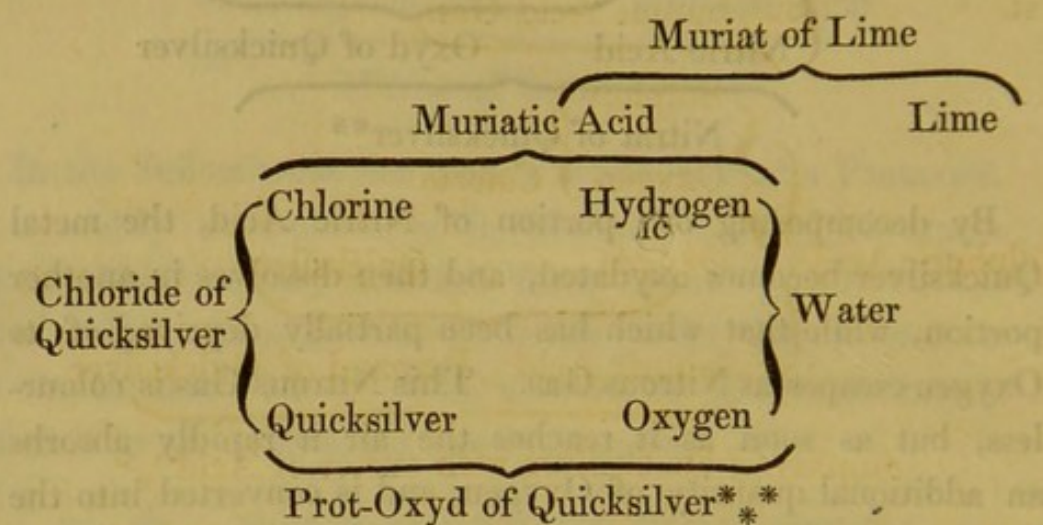
No. 32. *HYDRARGYRI NITRICO-OXYDUM.*

By decomposing one portion of Nitric Acid, the metal Quicksilver becomes oxydated, and then dissolves in another portion, while that which has been partially deprived of its Oxygen escapes as Nitrous Gas. This Nitrous Gas is colourless, but as soon as it reaches the air it rapidly absorbs an additional quantity of Oxygen, and is converted into the Nitrous Acid, giving rise to dense orange coloured fumes. Drying the salt obtained by evaporating the solution, and afterwards increasing the heat, nearly all the Nitric Acid is driven off, and the Quicksilver is left in a state of high oxydation, or in that of a Peroxyd.

No. 33. *HYDRARGYRI OXYDUM CINEREUM.*

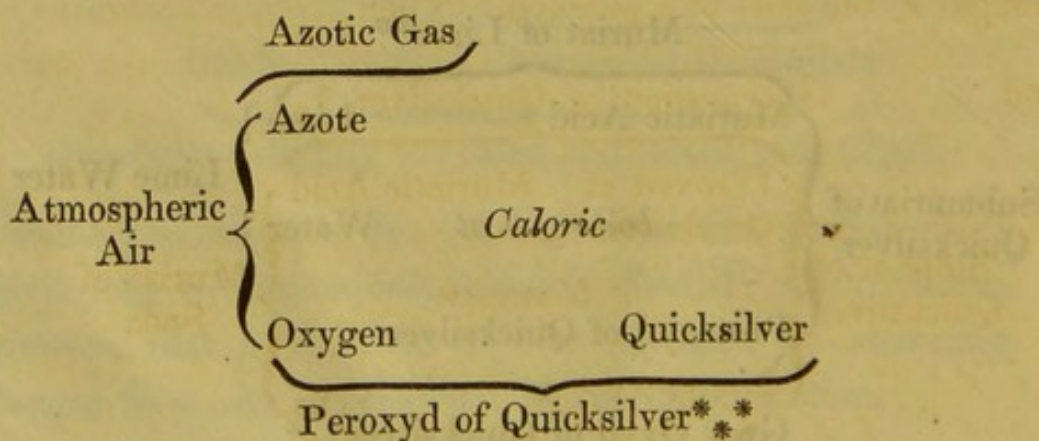
During the boiling of Calomel, or the Submuriat of Quicksilver in Lime Water, the Muriatic Acid is separated, and forms with the Lime a soluble compound. The protoxyd, being deserted by the Muriatic Acid, remains insoluble or fixed, like the Calomel from which it is formed.

But if we adopt the new theory already alluded to in the formation of Muriatic Acid No. 2, then



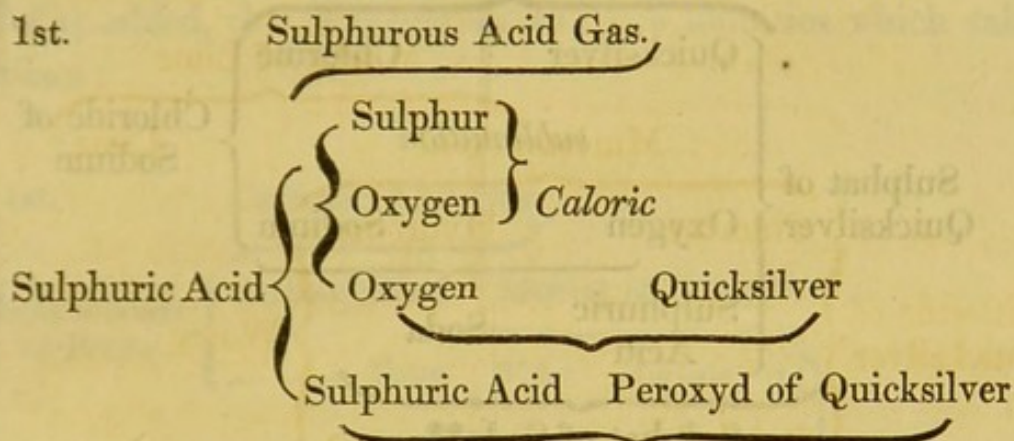
The Chlorine forms with the Hydrogen of the Water Muriatic Acid, and this is attracted by, and unites with the Lime; while the Quicksilver, quitted by the Chlorine, unites with the Oxygen of the decomposed Water, and forms the insoluble grey oxyd.

No. 34. *HYDRARGYRI OXYDUM RUBRUM.*



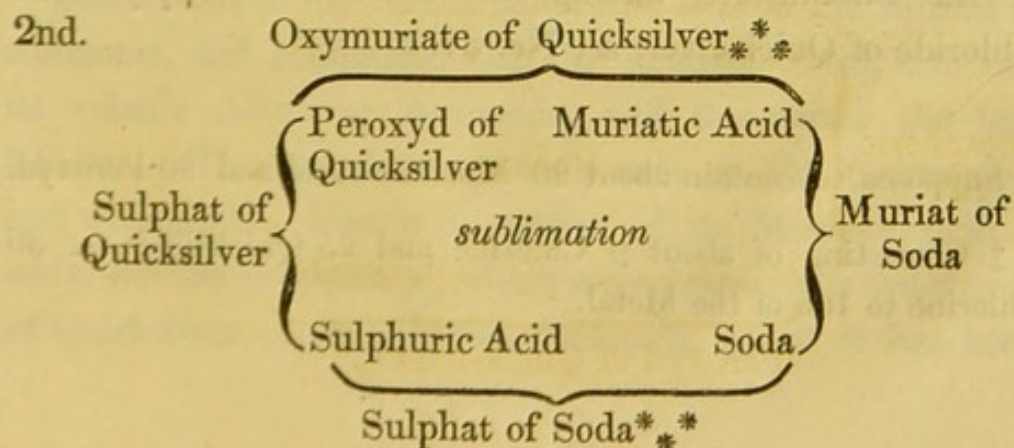
At the high temperature of 600° , which is just below the boiling point of Quicksilver, namely 656° , this metal decomposes common air, and combining with its Oxygen is converted into the state of a red peroxyd, in which the relative proportions are said to be of Quicksilver 100 and of Oxygen 7.99.

No. 35. *HYDRARGYRI OXYMURIAS.*

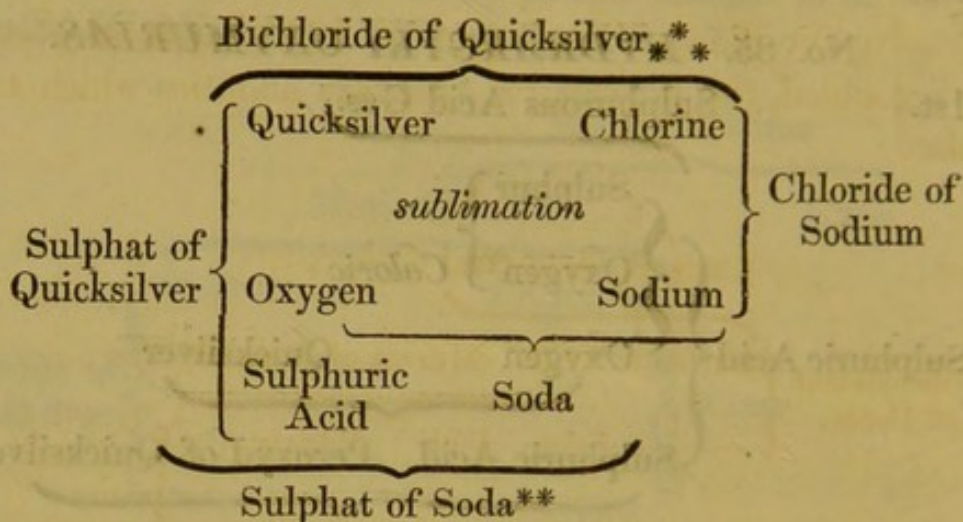


Sulphat of Quicksilver with excess of Acid* *

By the agency of Caloric, Quicksilver is enabled to decompose Sulphuric Acid, and taking Oxygen from a part, converts the remaining portion of Acid thus acted on into Sulphurous Acid, *i. e.* Sulphuric Acid *minus* a quantity of Oxygen. This new form of Acid being volatile, is driven off during the process. By the combined action of the Acid and Metal on each other aided by Caloric, the Quicksilver is brought to the state of a peroxyd. Then



According to this Scheme a double decomposition takes place, and two new salts are produced, the one Oxymuriate of Quicksilver† subliming, and the other, Sulphat of Soda remaining fixed in the heat employed. If, however, we adopt the new theory, then we shall have the following Scheme :



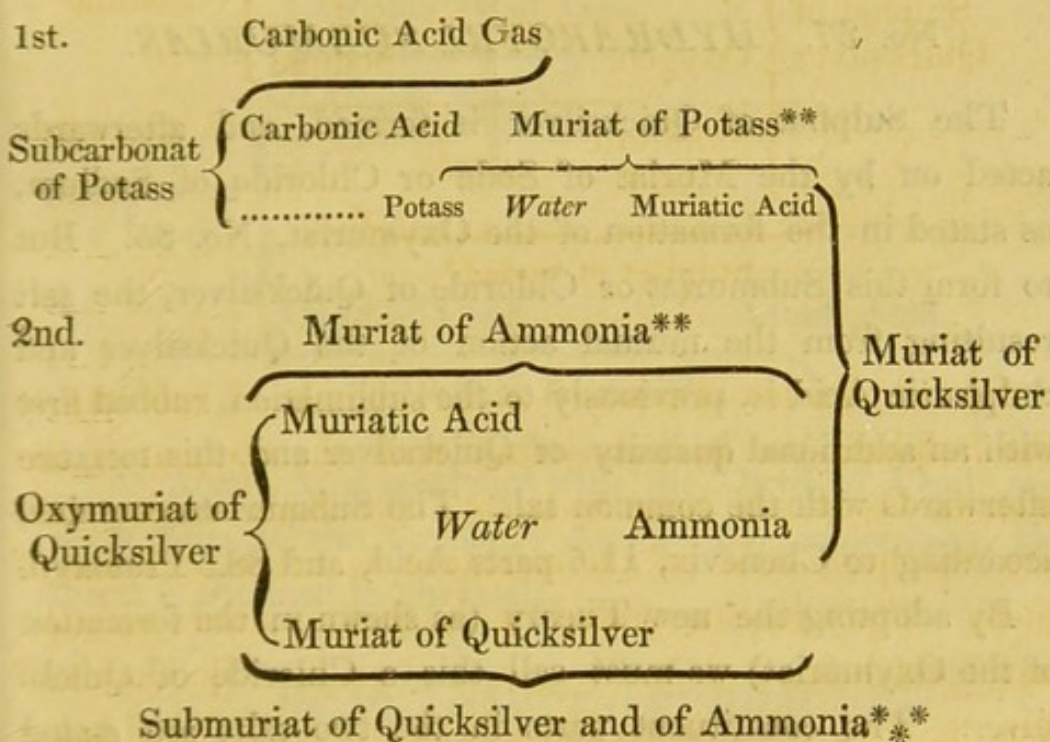
On the addition of common salt (Chloride of Sodium) to the Sulphat, the Sodium unites with the Oxygen of the metallic Oxyd and forms Soda, and the Soda uniting with the Sulphuric Acid of the mercurial Salt forms Sulphat of Soda. The Chlorine quitted by the Sodium unites with the metal which has lost its Oxygen, and yields a Bichloride of Quicksilver,‡ called also a Perchloride, from the Metal being saturated or having its *maximum* dose of Chlorine. Calomel, or the Submuriate, having less chlorine is simply called Chloride of Quicksilver, see No. 37.

† Supposed to contain about 20 Muriatic Acid and 80 Peroxyd.

‡ Consisting of about 9 Chlorine and 25 Quicksilver, or 36 Chlorine to 100 of the Metal.

No. 36. *HYDRARGYRUM PRÆCIPITATUM ALBUM.*

To Muriate of Ammonia and Oxymuriat of Quicksilver dissolved in Water, the Liquor of Subcarbonat of Potass being added, the following are the new affinities which take place :



The Potass of the Subcarbonat first acts on the Muriat of Ammonia, and combining with the Muriatic Acid, sets free its volatile Alkali or Ammonia, and this forms the first Scheme. The Ammonia instantly acts on the Oxymuriat, and withdrawing from it a portion of its Muriatic Acid, a white powder precipitates, which is considered as a Submuriat of Quicksilver combined with Ammonia, or as it has been

called, an Ammoniaco-Submuriate of Quicksilver, and this forms the second Scheme, although both in reality are but a single complex one. The Precipitate might indeed have been formed at once, and more directly, by the addition of Liquor Ammonia, or of its Subcarbonat to a solution of the Oxymuriat in Water, but owing to the sparing solubility of this salt, the above mode of preparing it is to be preferred as the least troublesome, though apparently operose and complicated.

No. 37. *HYDRARGYRI SUBMURIAS.*

The Sulphat of Quicksilver is formed, and afterwards acted on by the Muriat of Soda or Chloride of Sodium, as stated in the formation of the Oxymuriat, No. 35. But to form this Submuriat or Chloride of Quicksilver, the salt resulting from the mutual action of the Quicksilver and Sulphuric Acid is, previously to the sublimation, rubbed first with an additional quantity of Quicksilver and this mixture afterwards with the common salt. The Submuriate contains, according to Chenevix, 11.5 parts Acid, and 88.5 Protoxyd.

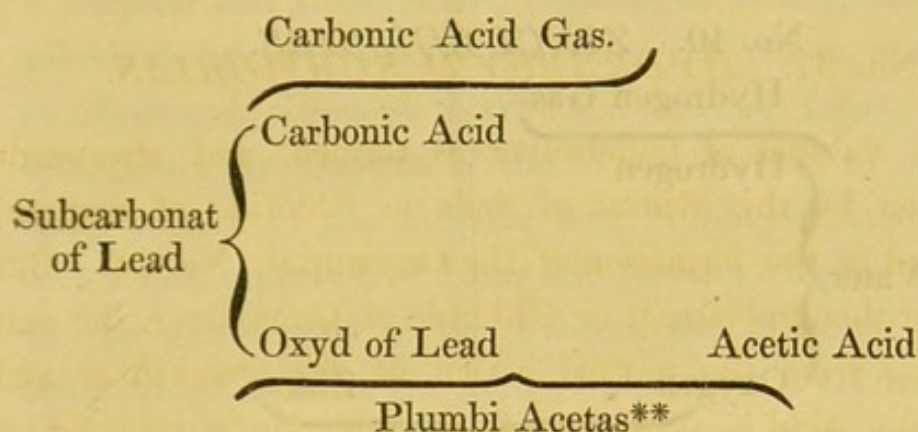
By adopting the new Theory (as shewn in the formation of the Oxymuriat) we must call this a Chloride of Quicksilver. The constituent parts in the two salts are stated to be in the

	Chlorine.	Quicksilver.
Chloride	18	100
Per or Bi-Chloride	36	100

and hence the propriety of calling the Oxymuriate a *Bi-Chloride*, seeing that it holds a *double* dose of Chlorine, and this larger dose is also designated by the other name of *Per-chloride*.

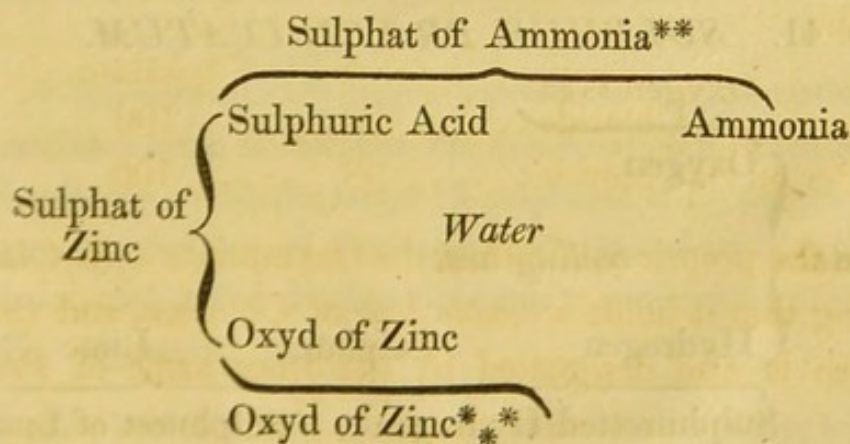
The intention of washing the sublimed mass with a solution of Muriat of Ammonia, is to remove any Oxymuriate of Quicksilver that may have formed in the process of sublimation; for the Oxymuriate is freely soluble in water containing Muriat of Ammonia, while the solution has no influence on the Submuriat; the two salts are thus readily separated from each other.

No. 38. *PLUMBI ACETAS.*



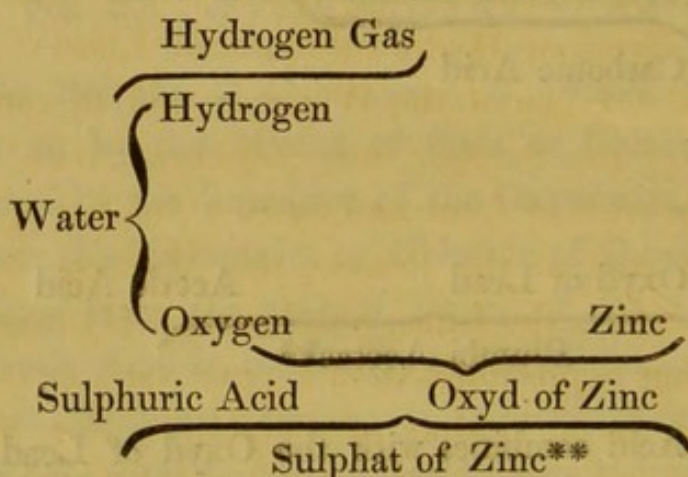
The Acetic Acid combines with the Oxyd of Lead, and expels from it the Carbonic Acid. By evaporation, the Acetat is obtained in chrystals.

No. 39. *ZINCI OXYDUM.*



Ammonia has great affinity for metallic Oxyds, and frequently combines with them, as is remarkably the case with Oxyd of Copper. In the above Scheme, the Ammonia takes the Sulphuric Acid from the Sulphat of Zinc, and the metallic Oxyd precipitates. The customary mode of preparing this Oxyd however, is by fusion of the Zinc under exposure to the air, when it vividly burns, or, in other words, rapidly combines with the Oxygen in the air, which in the high temperature to which it is exposed, it has the power of decomposing.

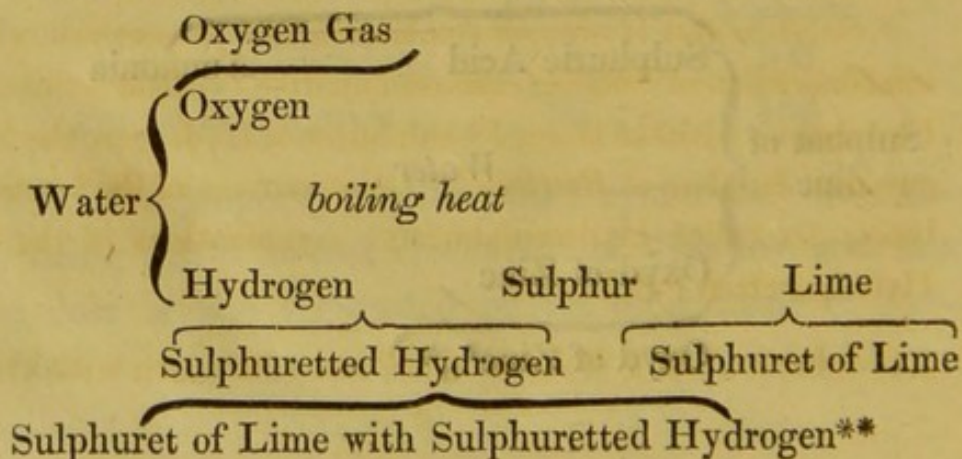
No. 40. *ZINCI SULPHAS.*

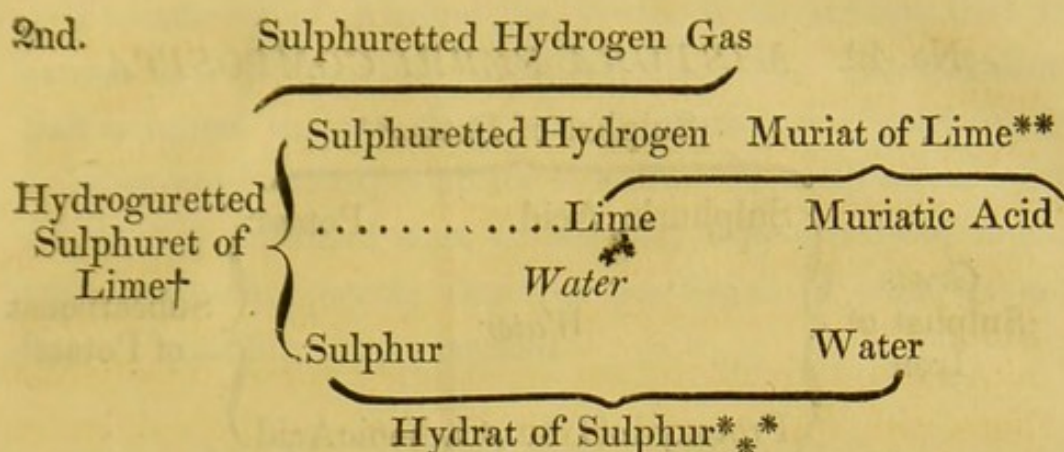


Zinc thrown into the *dilute* Sulphuric Acid, decomposes a part of the Water, and by combining with its Oxygen, is converted into an Oxyd soluble in the Acid, see No. 27, and the Hydrogen having nothing to detain it flies off as Gas.

No. 41. *SULPHUR PRÆCIPITATUM.*

1st.

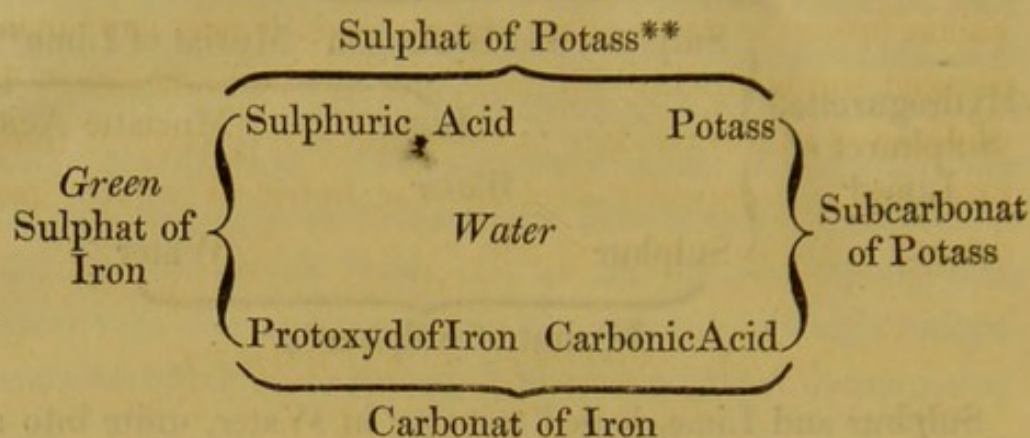




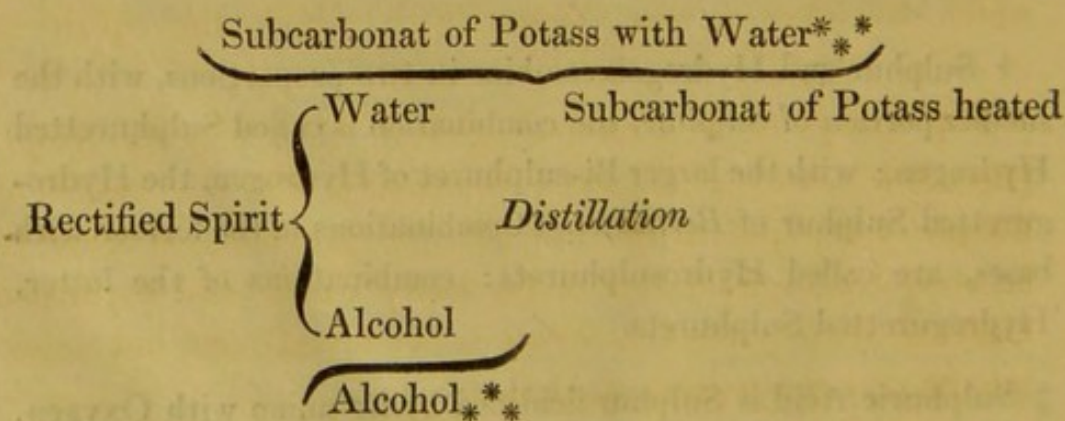
Sulphur and Lime, boiled together in Water, unite into a soluble Sulphuret, which decomposes the Water, and, taking its Hydrogen, forms an Hydro-sulphuret of Lime. At the same time, the Oxygen of the Water is said to convert a small portion of the Sulphur into Sulphuric Acid,† which unites with a portion of Lime and forms a Sulphat of Lime. In the second part of the Process, the Muriatic Acid, on being added, attracts the Lime, Sulphuretted Hydrogen flies off, and Sulphur is precipitated in a pure state, or to speak more correctly, as a Hydrat of Sulphur. For Sulphur naturally is of a greenish yellow colour, and the precipitated Sulphur, or *Lac-Sulphuris*, as it has been called from its whiteness, owes this white colour to a small portion of Water entering into its composition, and hence the more appropriate name of *Hydrat* of Sulphur.

† Sulphur and Hydrogen combine in two proportions, with the smaller portion of Sulphur, the combination is called Sulphuretted Hydrogen; with the larger Bi-sulphuret of Hydrogen, the Hydroguretted Sulphur of *Berthollet*. Combinations of the former with bases, are called Hydrosulphurets: combinations of the latter, Hydroguretted Sulphurets.

‡ Sulphuric Acid is Sulphur acidified by its union with Oxygen.

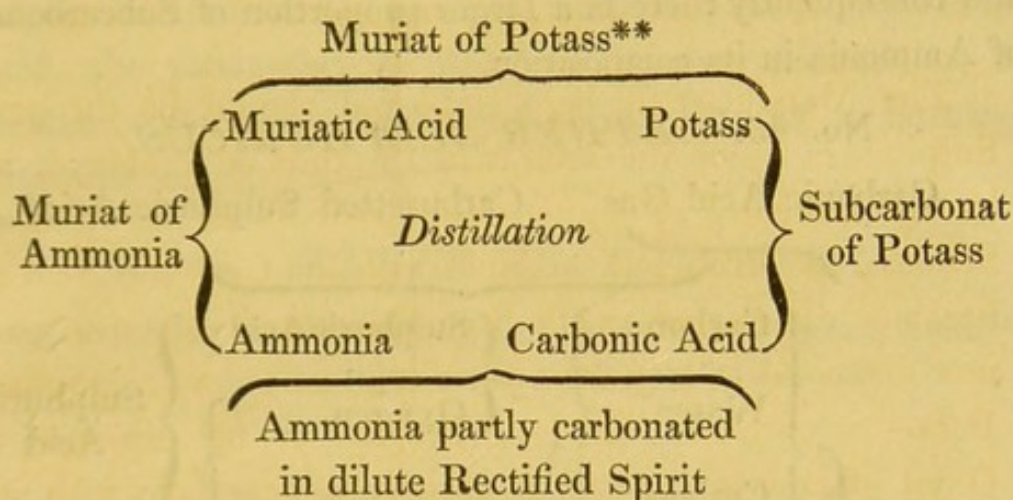
No. 42. *MISTURA FERRI COMPOSITA.*

The Metallic Salt here employed should be the *green* Sulphat, in which the Iron is in the state of Protoxyd, and by the influence of double decomposition, as shewn in the Scheme, the Protoxyd combines with the Carbonic Acid and becomes carbonated, while from the other component parts, now disunited or torn from their original union, a Sulphat of Potass is formed. By long keeping or by exposure, the Oxyd of Iron is disposed to attract, and combine with more Oxygen, passing into the *red* Oxyd, which is the higher state of oxydizement. To prevent this, the mixture should be made but in small quantities, and kept well secluded from the air.

No. 43. *ALCOHOL.*

The affinity of Alcohol for Water is so strong, that it cannot be freed from it by distillation merely. The Alkaline Salt is heated to drive off all the moisture it may contain, or in other words, to expel all its Water of Crystallization. In this heated and dried state it becomes very greedy of moisture, and consequently deprives the Spirit of what superfluous† quantity it may contain.

No. 44. *SPIRITUS AMMONIÆ.*



Here the Potass of the Subcarbonat combining with the Muriatic Acid sets free the Ammonia, which then becomes partly condensed in the Alcohol of the proof Spirit, and in part combining with the Carbonic Acid separated from the Potass, it forms a Subcarbonat of Ammonia; a portion of which dissolves in the Water with which the Spirit is

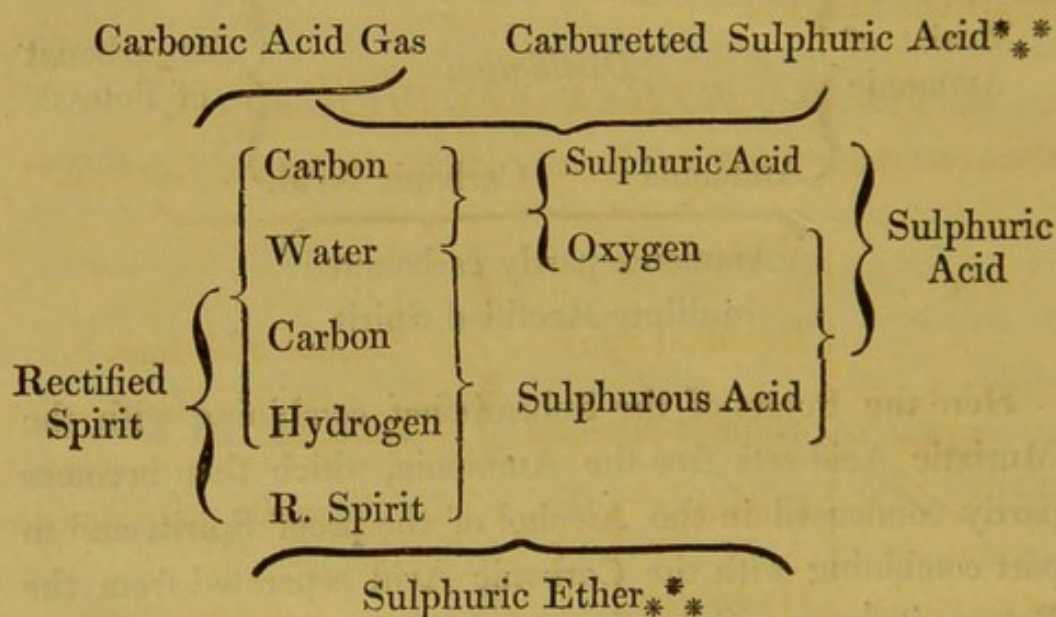
† It should be well recollected, that Alcohol *of the Shops*, (Rectified Spirit) is frequently confounded with the Alcohol *of Chemistry* (deaqueated Rectified Spirit.) Alcohol itself is said to be composed of Olefiant Gas (or heavy carburetted Hydrogen Gas) and *Water*; but this Water is not adventitious, but enters into its very composition as Alcohol.

diluted, while the other portion comes over in the solid form, and remains undissolved. Alcohol only combines with Ammonia when this is in its decarbonated or pure state; but in the *Spiritus Ammoniac*, the Rectified Spirit has its Alcohol mixed with an additional quantity of Water, and in this, some of the carbonated salt also is dissolved. In the

SPIRITUS AMMONIÆ AROMATICUS

a larger proportion of Water comes over in the distillation, and consequently there is a larger proportion of Subcarbonat of Ammonia in its composition.

No. 45. *ÆTHER SULPHURICUS*.

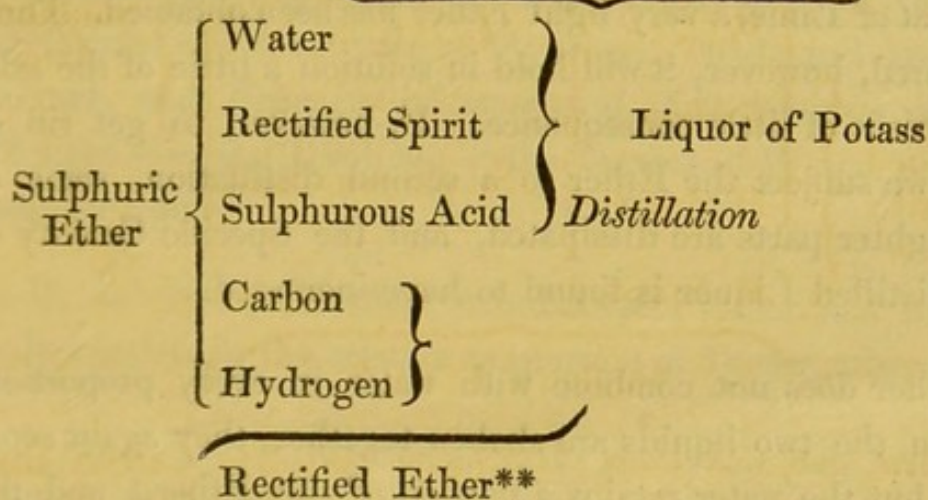


Ether contains more Hydrogen and less Carbon than Rectified Spirit, and hence as might be expected, it is of less specific gravity. After the first distillation, it is found to contain a small quantity of Sulphurous Acid, with some Water and *undecomposed* Spirit. Rectified Spirit may be repeatedly distilled without undergoing any change; but after it has been mixed with Sulphuric Acid, and the mixture is brought to the boiling heat, the Spirit is detained, and

exposed to a higher temperature than that in which it distils when uncombined. It is now decomposed, and leaving a portion of its Carbon behind in the Sulphuric Acid, it is itself converted into a lighter and more fragrant liquor. By continuing the process after all this ethereal liquor has passed over, the heat in the retort increases; and then the Carbon left behind, acting on the Sulphuric Acid, robs some of it of a portion of Oxygen, is itself converted into Carbonic Acid Gas, and at the same time changes the strongly *fixed* Sulphuric Acid, it has acted on, into a *volatile* Sulphurous Acid, the production of which is at once detected by a peculiar suffocating smell, resembling that of a burning brimstone match.

No. 46. *ÆTHER RECTIFICATUS.*

Potass detainin^g the Water, Rectified Spirit, & Sulphurous Acid.**



The intention here of adding the solution of Potass appears to be to neutralize and detain any Sulphurous Acid that may be present, and also to separate any *superfluous* Water, as well as any Rectified Spirit that may have come over in the first distillation, before the heat could be raised sufficiently high to decompose the Spirit. Rectified Ether

is only soluble in definite proportions of Water. The Water agitated with the distilled portion seems also intended to remove any Rectified Spirit that may still remain.* As a preferable mode of rectifying Ether, we have been recommended to put from time to time into the *Ether sulphuricus*, or Liquor of the first distillation, sticks of *Potassa fusa*, as long as these continue to be dissolved. The solution of the Potass depending on the presence of Water and Rectified Spirit, for in pure Ether Potass is insoluble; any Sulphurous Acid that may have come over with the first liquor will also thus be got rid of.† Another way of rectifying Ether is, to throw it into dry Muriat of Lime as long as this will dissolve. In both these processes the Liquor will separate into two portions, the Ether being the lighter and supernatant liquor; and from this the heavier liquor will be best parted by means of the separating funnel. By employing Muriat of Lime, a very light Ether has been obtained. Thus prepared, however, it will hold in solution a little of the salt, but this is of little consequence. If, however, to get rid of this, we subject the Ether to a second distillation, some of the lighter parts are dissipated, and the Specific Gravity of the distilled Liquor is found to have increased.

Ether does not combine with water in every proportion. When the two liquids are shaken together, they again separate, but the water retains a portion of the Ether,‡ and the

* By the washing the Ether is rendered lighter.

† The addition of the Potass gives some colour to the liquor, from which it may be freed by a second distillation as recommended by the College.

‡ About 10 parts Water take up one of Ether.

Ether remains united to a part of the Water. Alcohol unites, however, with water in any proportions.

Thompson, in his London Dispensary, says, the most probable opinion is that the Sulphuric Acid acts merely by abstracting Water from the Alcohol, and that Ether is Alcohol deprived of one-half of its water: and according to the experiments on which this opinion is founded, Alcohol consists of Olefiant Gas 100, Water 50; and Ether of Olefiant Gas 100, and Water 25; and Theodore de Saussure gives the ultimate components of 100 parts, as

67.98 Carbon

14.40 Hydrogen

17.62 Oxygen.

Olefiant Gas* is stated to be a compound of 4 volumes of Carbon, and 4 volumes of Hydrogen, condensed into one volume, and Ether to be composed of 2 volumes of this Olefiant Gas and 1 volume of the Vapour of Water, reduced into 1 volume.

If, however, the difference between Ether and Alcohol only consists in the relative proportion of Water, whence are

* Hydrogen Gas is found to unite chemically only with two proportions of Carbon; with the smaller proportion the Gas has received the name of Carburetted Hydrogen, or Bi-hydroguret of Carbon; with the other, in which there is double the quantity of Carbon, the Gas is called Hydroguret of Carbon, or Olefiant Gas. Hydrogen Gas when *pure*, even in combustion in Oxygen Gas, gives out but a very faint light, but this Olefiant Gas, which contains the largest quantity of Carbon, burns with more brilliancy than any other Gas we are acquainted with.

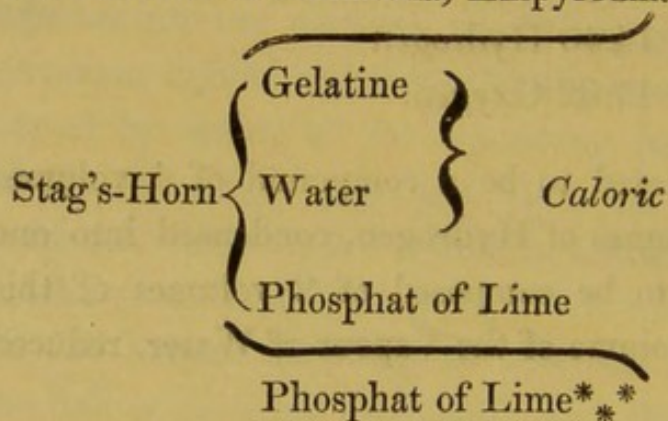
we to derive the large quantity of Carbon that remains in the retort after the distillation of the *Ether sulphuricus*?

No. 47. *PILULÆ FERRI COMPOSITÆ.*

The rationale of the action of the Subcarbonat of Soda and of the Sulphat of Iron on each other has been already explained under the *Mistura Ferri composita*, Scheme No. 42.

No. 48. *CORNU USTUM.*

Subcarbonat of Ammonia, Empyreumatic Oil and Water***



The *Cornu ustum* must be regarded as analogous to common bone-ash. The Horn here intended for use is that of the Stag, Hart, or Deer, a very different substance from that horn of the manufacturer, which forms the external part of the horns of oxen and several other animals. The pharmaceutic horn, therefore, is similar to the internal part or core which the other encloses, and differs probably in no respect from this or common bone, when all have been submitted to the strong action of fire. In the heat employed the Gelatine is decomposed, and its products are driven off, together with the Water. Gelatine consists of Azote, Hy-

drogen, and Carbon, and during the burning of the bone which contains it, a quantity of Subcarbonat of Ammonia, and of empyreumatic animal Oil is generated, both of which are volatile and fly off. When these matters are expelled, there remains a Phosphat of Lime, which is the *Cornu ustum* of the Pharmacopœia.

By conducting the decomposition of common bone, first deprived of its fat or marrow, in close vessels, the ammoniacal salt is preserved, and being by subsequent processes purified and freed from its offensive animal oil, it is made to form the basis of the extensively useful salt, the Muriat of Ammonia, from which we obtain all our preparations of Ammonia. The *Liquor volatilis Cornu Cervi*, as it was called, is a direct distillation from Harts-horn, in which the liquor is strongly impregnated with the animal oil above mentioned, and in this respect only does it differ from the *Liquor Ammoniae Subcarbonatis*.

The Syrup of Orange-Peel and the Syrup of Saffron, alluded to in the Introduction, should be made with the following proportions :

SYRUPUS AURANTIORUM.

℞ Aurantii Corticis recentis drachmas octodecim,
Aquæ ferventis fluiduncias octodecim,
Sacchari purificati libras duas cum semisse ;

Macera Corticem in Aqua per horas duodecim, in vase leviter clauso ; tum liquorem effunde, eique Saccharum adjice.

SYRUPUS CROCI.

R Croci Stigmatum drachmas novem,
Aquæ ferventis fluiduncias octodecim,
Sacchari purificati libras duas cum semisse;

Macera Croci Stigmata in Aqua per horas duodecim,
in vase leviter clauso; liquorem cola, et Saccharum adjice.

The following Table for the Regulation of the more common doses of Medicine, viz. the Ounce, the Drachm, and the Scruple, from the ages of one month upwards to the hundredth year, is given at the particular request of several of the Author's young friends.

AGE.	The ADULT DOSE being		
	1 Ounce.	1 Drachm.	1 Scruple.
1 Month	dr. ss	gr. iij	gr. j
3	—	— iv	—
6	scr. ij	— vj	— ij
9	—	— viij	—
1 Year	dr. j	— viij	— iij
2	{ — iss	— x	{ — iv.
3		— xij	
4 *		— xv	
5	— iiss	— xvij	— vj
6	— iij	— xx	— viij
7	— iiiss	— xxv	— viij
8 *	oz. ss	dr. ss	scr. ss
10	dr. ivss	gr xxxv	gr. xij
12	— v	— xl	— xiv
13	— vss	—	— xv
15	— vj	— xlv	— xvj
18	— viss	—	— xvij
20	— vij	— l	— xvij
21 to 45 *	oz. j	dr. j	scr. j
50	dr. vij	gr. l	gr. xvij
60 to 70	— vj	— xlv	— xvj
80 to 90	— v	— xl	— xiv
100 *	oz. ss	dr. ss.	scr. ss

This Table will serve either for solids or fluids. The dose affixed to the Age may be occasionally varied to that immediately above or below it. Opium must be cautiously given to young children, and the minim of the tincture is often to be divided into two or more doses.



The following Table for the Regulation of the more common cases of Abstinence, and the Quantity of the Food, is given in the form of one month's regimen to the Abstinence given in the first column, and of course to the Abstinence given in the second column.

The Abstinence Table

Abstinence	Quantity	Quantity
1 Month	1 Ounce	1 Ounce
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
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59	59	59
60	60	60
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62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

The Table will serve either for solid or liquid. The dose should be given either at the beginning or at the end of the day, and the quantity of the food should be given at the same time.

