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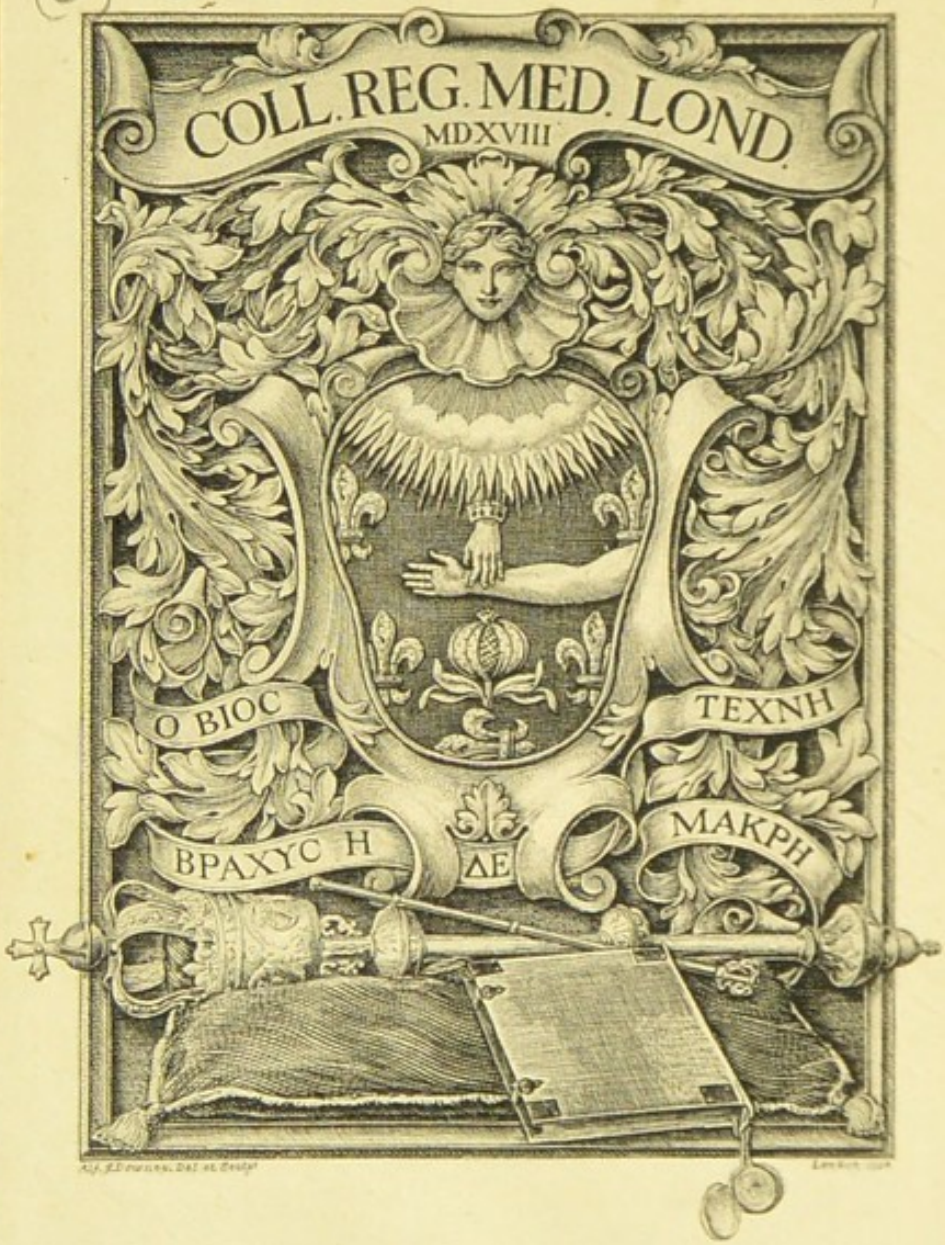

SYLLABUS

OF

A COURSE

OF

CHEMICAL LECTURES,

READ AT

GUY'S HOSPITAL.

BY

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PREFACE.

In every Science taught by lectures, a Syllabus of the Courſe has been found uſeful to the ſtudent. He is thereby furniſhed with a conciſe ſtatement of the ſeveral diviſions of the ſubject, and of its general arrangement. He is ſupplied with definitions of ſcientific terms, and is enabled to connect, and retain with facility, the information he receives.

The objects of Chemiſtry being various, its views extenſive, its prin-

ciples of union as a ſcience, ſubtle, and its inveſtigations minute, the aid of ſuch a ſynopſis was as neceſſary to it as to any other branch of Natural Philoſophy. Modern improvements as they have enlarged the ſcope of this ſcience, have added to the uſes of a proſpectus to explain it. The diſcoveries which have been recently made are ſo various and important, the Nomenclature has undergone, within theſe few years, ſuch a complete and eſſential change, that the Chemiſtry of the preſent day may be not improperly conſidered—as a new ſcience expreſſed in a new language.

It is on theſe grounds, that the author has thought it his duty to draw

up

up the following Syllabus of the lectures which he reads at Guy's Hoſpital.

As his courſe is neceſſarily deſigned for Medical Students, he has beſtowed particular attention on thoſe parts which relate to their profeſſion. He has not, however, by any means confined his views to this object alone, knowing that there is ſcarcely a ſcience or an art, ſcarcely a manufacture or an occupation, in which an acquaintance with chemical reſearch is not productive of advantage; that although the ſcholar, the artiſt, and the gentleman, may approach it with different views, each will obtain information more than ſufficient to reward him for the purſuit.

The author has, on this account, endeavoured to arrange the elementary principles of the ſcience, ſo as to render them applicable not only to medical purpoſes, but to every other to which Chemiſtry is adapted; and in doing thus much, he is not without hope, that, independent of preſent advantage, he ſhall have made himſelf uſeful to his pupils when they have ceaſed to attend him; that by future peruſals of this Syllabus, they may recall ſome valuable information which length of time or diverſity of employment had eraſed from their memories; that it may ſerve as a general outline of the ſcience, which they may fill up at their leiſure,—as a ſyſtematic arrangement, to which

they

they may refer whatever they can learn of others or diſcover of themſelves.

Although the ſyſtems of the older chemiſts are now exploded, and many of their principles ſhewn to be fallacious, their works are ſtill acknowledged to contain valuable ſources of information. But as the ancient Nomenclature differs ſo eſſentially from the modern, the young ſtudent often finds the meaning of theſe authors involved in conſiderable obſcurity. To obviate this difficulty as much as poſſible for the learner, tables are ſubjoined after the manner of the *Tabl. de la Nomenclat. Chim. propoſ. par M. M. Morveau Lavoiſier*, &c. in which the

old

old and new names of chemical ſubſtances are ſo claſſed, as to be brought under the eye, and compared at one view; and as ſome pains have been taken to render theſe tables at once copious and correct, it is hoped that they will, on moſt occaſions, be found to anſwer their intended purpoſe.

The properties of Light, ſo far as it is fit to conſider them in a chemical point of view, are comprehended under the head of the opinions regarding Caloric.

SYLLABUS OF CHEMISTRY.

INTRODUCTION.

OF the properties of *Matter*, the ſubject of experimental philoſophy in general.

Theſe either common to all bodies, as *Extenſion*, *Impenetrability*, *Diviſibility*, *Weight*; or proper to particular bodies, as *Colour*, *Figure*, *Texture*, *Solubility*, &c.

From the conſideration of the peculiar properties of *Matter* ariſes its diſtribution into different *Kinds*; and from the action of *theſe* upon each other, the various *Combinations* and *Decompoſitions* which conſtitute the province of CHEMISTRY.

CHEMISTRY therefore defined, *The Science of the Compoſition and Decompoſition of the heterogeneous particles of Matter.*

Of the diſtinction between this, and other branches of natural knowledge, more eſpecially *Natural Hiſtory* and *Natural Philoſophy*.

What is generally underſtood by the *Vis Inertiæ* of matter.

Of the *Motion* of bodies, as communicated to them by *external Impulſe*, or excited in them by their diſpoſition to *attract*, or *repel* each other.

Of the different ſpecies of *Attraction* which originate from this diſpoſition, viz. of *Magnetiſm*—of *Electricity*—*Capillary Attraction*—*Attraction of Gravitation*—*Attraction of Coheſion* and *Chemical Attraction*.

Of Chemical Attraction.

This found to operate excluſively between ſuch particles of matter as are *diſſimilar*, or *heterogeneous*.

It takes place amongſt the *more minute Particles* of matter, and at *inſenſible Diſtances*.

It requires that theſe ſhould poſſeſs a certain degree of *Fluidity*.

It

It produces in their properties very remarkable changes, of *Temperature*, *Specific Gravity*, *Texture*, *Colour*, *Taste*, *Smell*, &c. so that the properties of the compound can seldom be deduced from those of its component parts.

This attraction exerts itself between different bodies with different degrees of *Force*; hence the important doctrine of *Chemical Affinity*.

Of the construction of tables of *Simple* and *Compound Affinity*, called also tables of *Single* and *Double Elective Attraction*.

Of *Saturation*, or the limitation to the proportions in which certain bodies *chemically* unite.

Of the means by which the power of *Chemical Attraction* may be increased or diminished

The influence of *Heat* on it more especially remarkable.

Of Caloric.

How the terms *Caloric*, *Matter of Heat* or *Fire*, *Temperature*, &c. are philosophically to be understood.

Of the various opinions which have been entertained with regard to the nature of *Caloric*.

It exists either in a *loose* state, producing in different bodies *Warmth*, *Expansion*, *Fluidity*, *Volatility*, &c. in proportion to its quantity; or in a state of *Combination* in which its properties cease to be evident; in the one case called *sensible*, in the other *latent*.

Caloric in a *sensible* or *loose* state has a tendency to diffuse itself among contiguous substances, so as to maintain an uniformity of temperature.

It passes from one body to another with more or less celerity according to its intensity. *Dense* bodies also transmit it more readily, than *rare*; hence the distinction between more or less perfect *Conductors* of *Caloric*.

In *fluid* bodies it keeps up a perpetual circulation of their particles.

Equal quantities of *Caloric* produce unequal temperatures in equal quantities of dissimilar substances. Bodies therefore said to have different *Capacities* for *Caloric*, or to differ in their *specific* or *comparative Heats*.

A variation

A variation in the *Temperature* of bodies univerſally accompanied by a variation in their *Bulk*.

In ſome the dilatation and contraction appear to correſpond with the quantity of *Caloric* by which they are occaſioned. Hence the conſtruction of the *Thermometer*.

Of the precautions to be obſerved in the application of this uſeful inſtrument.

Of the *Liquefaction*, *Melting*, or *Fuſion* of bodies.

Of their *Volatilization*, or converſion into vapour by *Caloric*.

In this ſtate they poſſeſs a high degree of *Elaſticity*. Upon the expanſive power of volatized water depends the effects of the *Steam Engine*.

To the head of *Evaporation* may alſo be referred the proceſſes of *Diſtillation*, and *Sublimation*.

By accumulated *Caloric* bodies may be either rendered *luminous*, without ſuffering any other eſſential change; or they may be entirely altered in their properties, producing at the ſame time *Light* and *Heat*.—In the one caſe they are ſaid to be *ignited*, in the other *inflamed*. Hence the diſtinction between *combuſtible* and *incombuſtible* ſubſtances.

The *Inflammation*, or *Combuſtion* of bodies takes place only when they are expoſed to *Air*. The ſubjects of *Caloric* and *Air* therefore naturally connected.

Of atmospherical or common Air.

Of the *Weight*, *Elaſticity*, and other general properties of this fluid.

Subject to various changes from viciſſitude of temperature and other accidental cauſes.

Of the *chemical* properties of the inferior ſtratum of the *Atmoſphere*.

Shewn both by *Analyſis* and *Syntheſis* to be compoſed of two parts.

One by which *Reſpiration* and *Combuſtion* can alone be ſupported, *Oxygen Gas*.

The other in which both *Life* and *Flame* are immediately extinguiſhed, *Azotic*, or *Nitrogen Gas*.

Of Oxygen Gas.

Obtained in a ſeparate ſtate from *metallic Oxyds* and compounds of the *Nitric* and other acids by the application of heat.

Its purity aſcertained by mixture with *Nitrous Gas*. *Eudiometer*.

Somewhat heavier than *Common Air*.

Is abſorbed by many bodies upon ſimple expoſure, as in *Fermentation*, *Bleaching*, &c.

Serves the purpoſes of *Reſpiration* and *Combuſtion* in an eminent degree.

In *Reſpiration* is diminiſhed in bulk, and produces *Carbonic Acid Gas*; hence the function of the *Lungs* and origin of *Animal Heat*.

By combuſtion with *Hydrogen Gas* (ſo named from this property) it forms *Water*.

In the combuſtion of many other bodies, as *Sulphur*, *Phoſphorus*, *Charcoal*, &c. whilſt *Heat* and *Light* are given out, it communicates to them the properties of *Acids*. The gas itſelf diſappears, but produces in the acid *Reſidua* an increaſe of weight proportional to the quantity

 conſumed;

consumed; hence the modern theories of *Combustion* and *Acidification*, as depending on the decomposition of *Oxygen Gas* and the consequent union of its *Base* with the substances employed to effect it; and hence the terms *Oxygen* and *Oxygenation*.

Metals by combustion approach to an acid state, to which some may be brought by a further accession of *Oxygen*; hence the terms *Oxyd* and *Oxydation*.

Of Azotic Gas.

Remains after the abstraction of *Oxygen Gas* from *Atmospherical Air* on its exposure to *Sulphuret of Potash*, a mixture of *Iron Filings* and *Sulphur*, &c.

Obtained in its purest state from a mixture of *Oxy-muriatic acid* and *Ammoniacal* gasses.

Lighter than *Atmospherical Air*.

Noxious to *Life* and *Flame*, but not to *Vegetation*.

Forms a constituent part of *Animal Matter*.

More

More particularly characterised by the production of *Nitrous Acid* on its union with *Oxygen*, and of *Ammoniac* with *Hydrogen*. From the former of these properties obtains the name *Nitrogen*.

Of the means employed by nature to maintain a due proportion between this and *Oxygen Gas* in the composition of the *Atmosphere*,

---

Of Water.

The *physical* properties of *Water* differ in the *solid*, *liquid*, and *gasseous* or *vaporous* states of aggregation, which depend upon the influence of *Caloric*.

In its passage from the *liquid* to the *solid* state of aggregation, there takes place an increase of *Temperature*, an extrication of *Air*, or other extraneous matter previously contained, a peculiar arrangement of *Particles*, and a consequent augmentation of *Bulk*.

The *Expansion* of *Water* in the act of *Congela-*

tion exerts itſelf with irreſiſtible force; hence the beneficial effects of froſt on ſome occaſions and its inconveniences on others.

Water in the liquid ſtate to a certain degree *compreſſible*.

Poſſeſſes in this ſtate a *ſolvent* power over moſt other bodies, ſeldom therefore free from impregnation.

It enters into many bodies as a *conſtituent* part.

The temperature at which it paſſes to the ſtate of vapour proportional, as in all other *Liquids*, to the degree of preſſure made upon its ſurface, as ſeen in the application of *Papin's Digeſter*.

The *Vapour* of *Water* highly *elaſtic*; hence, as already mentioned, the conſtruction of *Steam Engines*.

By the *Vapour* of *Water* the combuſtion of many bodies is accelerated. When applied to heated *Iron*, *Zinc*, and other metals, it converts them into *Oxyds*, yielding at the ſame time *Hydrogen Gas*, which produces *Water* in combuſtion with *Oxygen Gas*, as before ſtated.

Water therefore no longer conſidered as an *Element*, but compounded of the *Baſes* of theſe two fluids.

Of

Of Hydrogen Gas, or Inflammable Air.

Found in a diſengaged ſtate in *Coal Mines*, on the ſurface of *Stagnant Waters*, and riſing through the waters of certain *Springs*.

Obtained alſo artificially from the diſtillation of *animal*, *vegetable*, and *bituminous* matter; from the application of heat to *Eſſential Oils*, *Alcohol*, *Æthers*, &c. and from pure *Ammoniac* by means the *Electric Spark*.

Pureſt from the decompoſition of *Water* by *Metals* as above ſtated, or during their ſolution in *diluted Acids*.

When pure many times lighter than *Atmoſpherical Air*; hence the conſtruction of *Aeroſtatic Machines*.

Smell adventitious.

On inſpiration proves noxious to *Animal Life*, apparently by the excluſion of the *reſpirable* part of the *Atmoſphere*; hence its late application in the treatment of certain diſeaſes, ariſing as it has been thought, from exceſs of *Oxygen* in the ſyſtem.

Burns only when in contact with *Oxygen Gas.* The *Slowness* or *Rapidity* of the combustion depends on the proportions, and intimacy of the previous Mixture.

On all occasions *Water* is the consequence.

The extrication of *Oxygen Gas* from vegetables growing under the influence of light depends, according to the general opinion, on the decomposition of *Water*, the *Hydrogen* of which is absorbed.

Hydrogen and *Nitrogen Gasses* by their union compose *Ammoniac.*

Of Acids.

Distinguished by being *sour* to the taste, changing vegetable *blue* colours to *red*, and by their extensive power of combining with other substances.

All unite readily with *Water.*

In

In combination with *Alkalis* form for the moſt part what are called *Neutral Salts*; with *Earths* and *Metallic Oxyds*, *earthy* and *metallic Salts*.

Moſt of the acids *antiſeptic*. Some powerfully *corroſive*.

Conſiſt of *Inflammable Subſtances* united to the baſe of *Oxygen Gas*, the proportion of which determines the degree of *acidity*.

Uſually divided into *mineral*, *vegetable*, and *animal*, according to the ſources from whence they are moſt abundantly obtained.

The *mineral Acids* are the *Sulphuric*, *Nitric*, *Muriatic*, *Carbonic*, *Fluoric*, *Boracic*, *Succinic*, *Arſenic*, *Tungſtenic*, and *Molybdenic*.

Of the Sulphuric or *Vitriolic Acid.*

Obtained from the burning of *Sulphur*, and diſtillation of *Sulphate* of *Iron*.

Concentrated afterwards by *boiling*.

When pure, *limpid*, *ponderous*, *unctuous*, *inodorous* and intenſely *ſour*.

Has

Has a powerful attraction for *Moisture*, and on mixture with *Water* occasions an increase of temperature.

Freezes most easily when concentrated.

Unites intimately with *Alkalis*, producing with the vegetable, *Sulphate* of *Potash* (*Kali Vitriolatum* P. L.), with the mineral, *Sulphate* of *Soda* (*Natron Vitriolatum* P. L.), and with the volatile, *Sulphate* of *Ammoniac*.

With the *Earths*, *Sulphate* of *Baryt*, of *Lime*, of *Magnesia* (*Magnesia Vitriolata* P. L.), &c.

With *Metals*, *Sulphate* of *Zinc* (*Zincum Vitriolatum* P. L.), *Sulphate* of *Copper* (*Cuprum Vitriolatum* P. L.), &c.

May be deprived of a portion of its *Oxygen* by treatment with *Inflammable Substances* converting it into *Sulphureous acid Gas*, or totally decomposed and reduced to the form of *Sulphur*.

The properties of *Sulphureous acid Gas* in many respects different from those of *Sulphuric Acid*. Its compounds therefore denominated *Sulphites*.

The *Sulphuric Acid* superior to most others in respect to its *Power* of *Attraction*.

The

The *order* of its *Attraction* is *Baryt*, *Potaſh*, *Soda*, *Lime*, *Magneſia*, *Ammoniac*, *Alumine*, *Metallic Oxyds*, *Water*, *Spirit*.

Employed principally in *Dying*, *Bleaching*, *Tanning*, *Purification* of *Oils*, and in *Medicine*.

Of Nitric Acid.

Obtained from the decompoſition of *Nitrate* of *Potaſh* by *Sulphuric Acid*, by de-aqueated *Sulphate of Iron*, or *Alumine*.

Purified by re-diſtilling from a freſh portion of *Nitre*, or by the addition of *Nitrate of Silver*.

In its common form, of a *yellowiſh* or *orange* colour. When pure, altogether *colourleſs*.

More *volatile* and leſs *ponderous* than *Sulphuric Acid*. Its *Acidity* equally intenſe.

Attracts *Moiſture* alſo from the atmoſphere, and unites readily with *Water*; but produces with it a leſs degree of *Heat*.

Deſtructive more immediately than the *Sulphuric Acid* of the life and texture of bodies to which it is applied.

By

By union with *Sulphuric Acid* acquires new properties, *Aqua Regina.*

By its union with the *Alkalis* produces *Nitrate of Potaſh* (*Nitrum* P. L.) *Nitrate of Soda, Nitrate of Ammoniac.*

With *Earths, Nitrate of Baryt, Nitrate of Lime, &c.*

With *Metals, Nitrate of Zinc, Nitrate of Iron, &c.*

In diſſolving *Metals,* is partially decompoſed and converted into *Nitrous Gas,* which on mixture with *Oxygen Gas,* reproduces *Nitric Acid,* and has many other remarkable properties.

Many of the *Inflammable Subſtances* produce a ſimilar effect.

Some decompoſe it more completely; and by the ſeparation of its *Oxygen* occaſion actual *Inflammation.*

Decompoſed alſo by expoſure to *Light,* as well as by the application of *Heat.* The product *Oxygen Gas,* with a certain admixture of *Azotic Gas.* Theſe therefore conſidered as the elements of *Nitric Acid.*

By different modes of combination they may be made to reproduce it.

The

The *order* of *attraction* of this acid the ſame as that of the *Sulphuric*.

Chief uſes in *Dying*, *Etching*, and *Aſſaying*; and ſometimes, though rarely, in *Medicine*.

Of Muriatic Acid.

Obtained by decompoſing *Muriate* of *Soda* (common or ſea ſalt) by means ſimilar to thoſe employed in the preparation of *Nitric Acid*.

Form *gaſſeous*.

In this ſtate is readily abſorbed by water, increaſing both its temperature and bulk, and communicating to it the general properties of an *Acid* (*Acidum Muriaticum*, P. L.).

In union with *Alkalis* forms *Muriate* of *Potaſh*; *Muriate* of *Soda* (*Sal Muriaticus*, P. L.) and *Muriate* of *Ammoniac* (*Sal Ammoniacus*, P. L.).

With *Earths*, *Muriate* of *Baryt*, of *Lime*, &c.

With *Metals*, *Muriate* of *Zinc*, of *Iron*, &c.

With ſome of the *Metals*, as *Zinc* and *Iron*, and ſome of the *Inflammable Subſtances*, as *Alcohol*, *Eſſential Oils*, *Phoſphorus*, &c. it produces *Hydrogen Gas*.

On diſtillation from certain *metallic Oxyds*, it unites with their *Oxygen*, and acquires thereby a ſingular alteration in its properties. *Oxy-muriatic Acid*, *Aqua regia*.

Remarkable in this form for its effects on animal and vegetable colours; hence its preſent application in *Bleaching*.

The affinity of *Muriatic Acid* in moſt inſtances weaker than that of either the *Sulphuric* or *Nitric*; but the order of its attraction the ſame.

Baſis as yet unknown.

Employed principally in *Medicine*, *Bleaching*, *Dying*, and *Aſſaying*.

Of Carbonic Acid.

Sources of this *Acid* various.

Uſually collected from bodies undergoing the *vinous Fermentation*; or from *Carbonated Earths* or *Alkalis*, by the application of *Heat*, or more commonly by the addition of an *Acid* of ſuperior attraction.

Specifically *heavier* than atmoſpherical air, nearly as 2 to 1.

In

In a high degree noxious, when employed alone in *Respiration*.

Equally unfavourable to the process of *Combustion*.

Unites readily with *Water*, communicating to it *acid* properties, and a consequent solvent power over other bodies; hence the nature and imitation of various *medicinal Springs*.

Renders *Alkalis* capable of crystallization. In union with *Potash* forms *Carbonate* of *Potash* (*Kali Præparatum* P. L.); with *Soda*, *Carbonate* of *Soda* (*Natron Præparatum*, P. L.); and with *Ammoniac*, *Carbonate* of *Ammoniac* (*Ammonia præparata* P. L.)

With *Earths*, *Carbonate* of *Baryt*, of *Lime*, &c.

With *Metals*, *Carbonate* of *Zinc*, &c.

Has for its base *Carbon*, which by combining with *Oxygen*, uniformly produces it, and which it has been found to yield upon being decomposed.

Inferior to most of the *Acids* in its *Attraction* for other bodies.

Order of Attraction, *Baryt*, *Lime*, *Potash*, *Soda*, *Magnesia*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*. Uses chiefly *medical*.

Of Fluoric Acid.

Obtained by decompoſing *Fluate* of *Lime* by means of the *Sulphuric Acid.*

Form *gaſſeous.*

Heavier than atmoſpherical air, as 1.5 to 1.

Cauſtic.—Azotic.

Unites readily with *Water*, and renders it intenſely ſour.

In union with the *Alkalis*, forms compounds of a gelatinous conſiſtence.

Poſſeſſes the remarkable property of diſſolving and volatilizing *Silex.*

Diſſolves *Zinc*, *Iron*, and *Copper*; the other metals not acted on, unleſs in the ſtate of *Oxyds.*

Baſis unknown.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit.*

Uſe—*Etching on Glaſs.*

Fluoric acid is a pure acid, more powerful
in its gaseous state, it is found in great abun-
dance in many parts of this country, combin-
ed with mineral substances, it is unlike
marbles or the earths, because in its union with
sulphuric acid, it does not effervesce or give
out heat & requires the external applica-
tion of heat to produce decomposition & in
distillation is completely thereform, this
acid gas in contact with water becomes gelati-
nous, which substance is altogether com-
posed of flinty earth & it is therefore a
compound of this acid & water, but if it
be distilled in a metallic vessel instead
of a glass one, no such gelatinous sub-
stance appears, it is elastic. It may
be obtained by pouring by pouring sul-
phuric acid on fluor or the fluate of
lime & distilling them. Fluor is uni-
formly cubical when crystalized & is
therefore called Cubic fluor, & is found in
the northern counties of England, espe-
cially in Cornwall. It is a compound of
lime & acid of fluor. The gas of this

substance completely destroys flinty earth, therefore wd completely destroy a glass vessel in a thousand holes. If the surface of glass be defended with proper varnish it may be etched or beautifully by applying this acid, or with a common engraving instrument & glass is ornamented in this way. This gas is totally unfit for respiration of animals. The fluates of lime however are found in different states of aggregation. This then is the only acid capable of making any impression on glass except the white acid of arsenic which does it slightly

The Boracic Acid is that scaly salt first obtained from the decomposition of Borax & diluted sulphuric acid, which was formerly called the sedative salt of Homberg. Borax is a compound of mineral Alkali & acid of Borax. It changes Vegetable Blue to Green. It easily vitrifies by heat & powerfully promotes the vitrification of other bodies but it is not durable; it is used as Solder, instead of common Borax which fluxes the metallic oxyd

Of Boracic Acid.

Found in ſolution in the water of certain *Lakes*; or obtained artificially, by decompoſing *Borate* of *Soda* by *Sulphuric Acid*; or by ſublimation with *Sulphate* of *Iron*.

Form *concrete*, *ſcaly*; *Semi-tranſparent*, and of a *pearly luſtre*.

Sparingly ſoluble in *Water*; more ſo in *Alcohol*, to the flame of which it comunicates a greeniſh tinge.

When united with *Water* eaſily ſublimed.

Fuſible without addition into a tranſparent *Glaſs*.

Forms, with *Potaſh*, *Borate* of *Potaſh*; with *Soda*, *Borate* of *Soda* (*Common Borax*); &c.

With *Lime*, *Borate* of *Lime*, &c.

Baſis unknown.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Suppoſed by the diſcoverer Homberg to poſſeſs peculiar *ſedative* powers, and hence called by him *ſedative ſalt.*

Of Succinic Acid.

Obtained from *Amber* by diſtillation without addition.

Freed from *Empyreumatic Oil*, and rendered colourleſs, by rediſtillation; by ſolution and filtration; by ſolution in muriatic acid; or, by detonation with *Nitre.*

Readily ſoluble in *cold Water*, ſtill more ſo in *boiling Water* or in *Spirit.*

Form *concrete*, conſiſting of minute triangular priſms, truncated at their apices.

Unites with the *Alkalis*, *Earths*, and *metallic Oxyds*, forming with them compounds, the properties of which have as yet been little enquired into.

Baſis not aſcertained.

Order of attraction—*Baryt*, *Lime*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit.*

Uſe confined to medicine.

Succinic acid

Amber by distilled in a retort, volatile Alkali, inflammable gas & a concrete of brown Sugary form are given out, & the latter when repeatedly washed forms the Salt of Amber or the Succinic acid. This Acid is soluble in Water at the common temperature of Water.

Arsenic Acid

If the white oxyd of Arsenic be mixed with muriatic acid & then with re-peated quantities of nitric gas & the application of heat, at length the oxyd is hyperoxygenated & is now more soluble in water, more rapid to the taste, changes vegetable blue to red, with other properties of acids. The Regulus & the white calx or oxyd of Arsenic & the acid are the common forms of the Arsenic, only differing in proportion to the oxygenous or acidifying princi-ple.

Of Arſenic Acid.

Obtained by the acidification of common *Oxyd* of *Arſenic* by treatment with the *Nitric* or *Oxymuriatic Acid*; *Nitrate* of *Ammoniac*; or other ſubſtances capable of furniſhing *Oxygen*.

Form *concrete*.

Pretty readily ſoluble in *Water*. Melts into a tranſparent *Glaſs*, which on cooling becomes opake.

By the continued application of heat may be reduced into the form of *Oxyd*.

Combines with the *Alkalis* in certain proportions, and forms with them cryſtalliſable ſalts. *Arſeniate* of *Potaſh* (*Macquer's Arſenical Salt*), &c.

Combines alſo with moſt of the *Earths*.

Acts on ſeveral *Metals*, as *Zinc*, and *Iron*; and enters into union with moſt of the metallic *Oxyds*. *Arſeniate of Copper* (*Scheele's green Pigment*); &c.

In the dry way decompoſes many of the compound ſalts, as *Sulphate* of *Potaſh*, of *Soda*, &c.

By diſtillation with *Charcoal*, or digeſtion with *Turpentine*, *Expreſſed Oils*, or *Sugar*, may be completely deprived of its *Oxygen*, and reduced to a *Regulus*.

Unites readily with *Sulphur*.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Medical properties nearly the ſame as thoſe of the *white Oxyd*, or common arſenic.

Of Tungſtic Acid.

Obtained from the mineral ſubſtances *Tungſten* and *Wolfram*, by fuſion with *Carbonate* of *Potaſh*, ſolution in *Water*, and addition of *Nitric Acid*; or by alternate digeſtion in *Nitric* or *Muriatic Acid*, and *Ammoniac*, and ſubſequent application of heat.

Form *pulverulent*.—Colour *yellow*. Specific gravity 6, 12.—*Inſipid*.—*Inſoluble*.

Infuſible per ſe, but with *Phoſphate* of *Soda*, and *Ammoniac*, forms a blue, and with *Borate* of *Soda*, a brownish-yellow glaſs.

Not

Not acted upon by other acids.

With *Potash*, and *Ammoniac*, forms salts with excess of Alkali, convertible into triple compounds by the addition of the *Nitric* or *Muriatic Acid (Tungstenic Acid* of *Scheele)*.

With *Baryt*, *Lime*, and *Magnesia*, salts of difficult solubility.

Unites with most of the *Metals*, under the application of the higher degrees of heat.

Unites also with *Sulphur* into a friable mass.

May be reduced to a *Regulus*, by being heated with *Charcoal*; this peculiar metal therefore to be considered as its basis.

Order of attraction, *Lime*, *Baryt*, *Magnesia*, *Potash*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Of Molybdic Acid.

Obtained from the mineral substance *Molybdena (Sulphuret* of *Molybdena)* by treatment with *Arsenic Acid*; or *Nitric Acid* diluted; or by deflagration with *Nitrate* of *Potash*, solution in water, and addition of diluted *Sulphuric Acid*.

Form,

Form, *pulverulent.*—Colour *white.*—Taſte *metallic.*—Specific gravity 3, 46.

Of little ſolubility in *Water*, more ſoluble in *Sulphuric Acid*, ſtill more ſo in the *Muriatic*; the two laſt of which on cooling acquire a blue colour.

Sublimes into white flowers under the joint application of *Heat* and *Air*.

Unites with *Potaſh*, and forms a ſalt, cryſtalliſable by evaporation — With *Ammoniac* one which parts with its alkali in a gentle heat.

With *Baryt*, *Lime*, and *Magneſia*, ſalts ſparingly ſoluble in water.

Diſſolves ſeveral *Metals*. By fuſion with ſome of them, as *Iron*, *Copper*, and *Silver*, forms friable compounds. Alſo precipitates ſeveral of the metallic ſolutions, as *Nitrate of Silver*, *Quickſilver*, &c.

In the dry way, decompoſes ſeveral of the *Neutral ſalts*.

By union with *Sulphur* it regenerates *Molybdena*.

May be metallized by mixture with *Oil*, and application of an intenſe degree of *Heat*.

Order of attraction not yet aſcertained.

The

Acetic Acid or Vinegar

is the result of the spontaneous fermentation process in certain vegetable & animal matter. There is no vinous liquor which when diluted, exposed to air of a certain temperature & agitated but has a strong disposition to contract acid properties. Many, especially vegetable substances become sour without giving out any vinous or spirituous matter, some on the contrary produce better acid & in greater quantity in proportion as it contains more spirit, the stronger the liquor the better is the acid; a certain quantity of spirit checking the acetous process, but at length increases the purity of the acid. All fermented liquors then are apt to become acetous by a change of circumstances. Common vinegar retains still a certain quantity of spirit, has a certain quantity of mucilage with oily matter, some colour with a

superabundance of water which are able to be removed by distillation in glass Ves-sels, the first which is given over is to be rejected, because the water is more volatile than the ~~Acetic~~, the latter part also becoming empyreumatic is to be rejected it is then rendered colourless & transparent if kept from the contact of air or otherwise will run into the putrefactive state. If the Vinegar be put into Bottles & there be placed in the hot water bath till has acquired as much heat as it can bear, it will keep for many years. Moderate ca-pitation gives an opportunity of removing water from the Acid without at all decom-posing it, but it is still much more con-centrated by combining it with earthy or alk-line matter, forming it thereby fixed or by forming a Salt which being mixed with the smallest quantity of sulphuric acid the acetic acid is evolved in great plenty & purity in a gaseous form & this is the radical form vinegar which is called Acetic acid in contradistinction to the ac-etous or common vinegar, nor does ad

The *Vegetable Acids* are, the *Acetic*, *Tartareous*, *Pyro-tartareous*, *Oxalic*, *Gallic*, *Citric*, *Malic*, *Benzoic*, *Pyro-ligneous*, *Pyro-mucous*, and *Camphoric*.

Of Acetic Acid.

Obtained by the ſimple diſtillation of *Acetite of Copper* (*Acidum Acetoſum* P. L.), or by decompoſing *Acetite* of *Potaſh* by the *Sulphuric Acid*.

Form, *liquid—Colourleſs*.

Contains a larger proportion of *Oxygen* than the *Acetous Acid* or vinegar, and therefore of greater acidity.

Of the preparation of the *Acetous Acid* from different vinous liquors, and the circumſtances which more eſpecially promote it.

The *Colour*, *Acidity*, and other properties of this, depend chiefly on the material from which it is obtained. Uſually of a ſharp ſour taſte, and ſpirituous acid odour.

By keeping loſes its *acidity*, becoming thick and putrid. The *Heat* of *boiling Water* counteracts theſe changes.

Moſt conveniently *purified* by cautious diſtillation in veſſels of glaſs.

The

The higher degrees of heat decompoſe it.

May be *concentrated* by freezing.

Forms with *Potaſh*, *Acetite of Potaſh* (*Kali Acetatum* P. L.), with *Ammoniac*, *Acetite of Ammoniac* (*Aqua Ammoniæ Acetatæ* P. L.).

Diſſolves moſt of the *Earths*.

Diſſolves alſo moſt of the *metallic Oxyds*, producing with *Lead*, *Acetite of Lead* (*Ceruſſa acetata* P. L.); with *Copper*, *Acetite of Copper* (*Aerugo* P. L.), with *Quickſilver*, in the *acetic* form, *Acetate of Quickſilver* (*Hydrargyrus Acetatus* P. L.).

Gums, *Gum-reſins*, vegetable eſſential *Salts* and *Extracts* ſoluble in *acetous Acid*; hence its extenſive application in pharmacy.

Appears to be a compound of *Carbon* and *Hydrogen* in union with *Oxygen*.

Order of Attraction, *Baryt*, *Potaſh*, *Soda*, *Ammoniac*, *Lime*, *Magneſia*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Employed in the arts, as in *Dying* and *Printing*, and alſo extenſively for *dietetic* and *medical* purpoſes.

Of

lution alone account for the difference as the former has more oxygen. The acetic acid is employed for purifying sick rooms; it is otherwise also unlike common vinegar is more pungent producing different compounds & the difference is that from heat of the sulphuric acid, this is decomposed & gives it oxygen to the other acid; but it is probable that the only difference between the acetic & the acetous acid consists in the disparity of the oxygen. The Acidum Acetosum is procured from the distillation of verdigris & sulphuric acid & called Thieves vinegar, but if it is made according to the London Pharm. it may be contaminated with oxyd of copper was even to make it green & very pernicious; & requires redistillation if this be suspected. It is better therefore to make it by pouring Sulphuric acid on the Potassa acetatum in a retort & distilling it & it may be used to impregnate rooms by placing a lamp simply under it & the vap. Sp.t of Wine has a strong disposi=

-tion to check fermentation suddenly at
& goes on very slowly afterwards & we at len
obtain a larger proportion of alcohol. White
Wine is generally stronger than Red com
Wine, hence it produces a stronger vine
Fermented liquors should be kept in V
-sels which should be inverted or placed o
their side, so as to give an opportunity f
any inflammable fluid which may be ge
-rated to escape by its levity by the cork
The Vegetable fermented acid is of all
others the most important & Sp.! Ple
Water & Vinegar are the 3 great men
-strua in Pharmacy -

Of Tartareous Acid

This acid is procured from tartrite of Potash or chrystals of tartar by the addition of lime or chalk & sulphuric acid diluted, the former being dissolved in Water, & this acid explains the chrystals of tartar, its acidity depending on the peculiar particular acid. If the superabundant acid be saturated with fixed alkali then soluble tartar is formed which is a neutral & more soluble salt, carbonic acid being evolved by the effervescence because it contains no carbonic acid gas without producing any soluble tartar, this decomposing the potash of the cream of tartar, the chalk producing only partial decomposition to this dilute sulphuric acid is to be added, wch produces a quantity of Selenite or gypsum which is insoluble & is an acid of lime the liquor is to be passed thro paper, & is to be evaporated till a pellicle appears on the surface, allowing it then to cool & the soluble tartar chrystalizes, it differs only

in the proportion of the acid. In the new
=ish Pharmacopoia it is used instead of the
Chrystals of tartar because more agreeable
If it be distilled it produces an acid of a
particular empyreumatic taste called
Pyro-tartaric-acid. If instead of carbonate
Lime the tartarised lime is then in greater
quantity, because a larger quantity
of the acid is produced here by single affinity
by double electrive attraction, the lime is
already in union with the carbonic acid
gas, but the acid of tartar has a greater
attraction for lime than the carbonic
acid gas; but if lime be added in sufficient
quantity the chrystals of tartar are
wholly decompose it; or if to a solution
of Potash tartarisation you add nitric
the sulphuric acid, you have a tartar
mixture containing salts, of a nature
analogous to those of chrystals of tar

Of Tartareous Acid.

Obtained from *Acidulous Tartrite of Potaſh* by means of *Lime*, or *Carbonate of Lime*, and the ſubſequent addition of *Sulphuric Acid* (*Acidum Tartari cryſtalliſatum* P. Suec.). May alſo be prepared by the *Sulphuric Acid* alone.

Cryſtalliſes in ſmall tranſparent ſcales or needles. Not altered by expoſure to *Air*. Readily ſoluble in *Water*, and of an agreeably acid taſte.

Eaſily decompoſed by *Heat*.

Yields *Oxalic Acid* by treatment with the *Nitric*; and *Acetous* by digeſtion with *Water* and *Spirit*.

In union with *Potaſh* forms, according to the proportions, *Tartrite of Potaſh* (*Kali Tartariſatum* P. L.), or *acidulous Tartrite of Potaſh* (*Cremor Tartari* P. L.), and with *Soda*, *Tartrite of Soda* (*Natron Tartariſatum*, P. L.)

Diſſolves *Lime*, *Magneſia*, and *Alumine*.

Diſſolves alſo ſeveral of the *metallic Oxyds*, and precipitates many of them from their ſolutions in other *Acids*.

Differs

Differs only from the foregoing in the proportion of its *Oxygen*.

Order of Attraction, *Lime*, *Baryt*, *Magnesia*, *Potash*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Use confined to *Medicine*.

Of Pyro-tartareous Acid.

Obtained from *acidulous Tartrite of Potash*, or the *Tartareous Acid* by distillation with a strong *Heat*.

Form, *liquid*.—Taste, *empyreumatic*.

Redistillation dangerous, from the sudden evolution of elastic matter.

Compounds of this *acid* not as yet examined.

Of Oxalic Acid.

Obtained from *Sugar*, *Malt*, *Galls*, and various other substances, by treating them with *Nitric Acid*.

Form *concrete*. Crystallises into transparent quadrangular *Needles*. Taste very *acid*.

Readily

Oxalic Acid

Is procured from many vegetable & Animal substances by treatment with Nitric acid, & is peculiarly sour, by pouring nitric acid on sugar in a retort a considerable quantity of nitrous gas is evolved & gradually escapes (and the process should therefore be conducted in an open chimney) on the cooling of the materials left a concrete saline salt

is produced & which is rendered very pu
by repeated solution, & this is the acid
of Sugar. This acid is the result of the
decomposition of the carbonic gas of the ch
-coal of the vegetable or animal substan
employed & of the oxygen contained in th
nitric acid, the latter also being decom
-posed. For the base of all acids is charc
& oxygen uniting in different proportions
This Salt has a very strong powerfu
oxyd of Iron as well as the nitrous &
muriatic acid have, hence its use in
taking out Iron moulds in linen as wa
having a tendency to destroy the texture
of the cloth, the acid of Sorrel is chiefly
used for this purpose; but the most im
-portant use of this acid is to detect the
presence of calcareous earth, of which
is a very delicate test, producing an
-soluble precipitate; the acid exceedin
every other substance in its power of
attracting this earth; it is commonly

therefore used in the analysis of mine=
ral waters, &c a grain or two of this
salt added to limie water immediately pro=
duces turbidity & a white precipitate
Many inflammable articles being capa=
ble of producing the acid of Sugar by the
decomposition of the nitric acid, it is
supposed that it is the result of the de=
composition of the oxygen of the acid,
the oxygen uniting with the particu=
lar inflammable substance used with
it.

Of Gallic Acid

is obtained from Galls & other vegetable astri=gents in infusion. The infusion at length becomes Mouldy & from this is obtained Salt in Crystals, which are over bad astringent, very different from the qualities of the base; it is most soluble in spirit, The most useful property of it is its producing a black colour with oxide of Iron, & hence its use in making Ink

Readily ſoluble in *Water*: ſoluble alſo, and without decompoſition, in the *Sulphuric* and other *Acids*, *Spirit of Wine*, *Æther*, *eſſential*, and *expreſſed Oils*.

Eaſily decompoſed under the application of the higher degrees of *Heat*.

Forms peculiar compounds with the *Alkalis*, with moſt of the *Earths*, and with ſeveral of the *metallic Oxyds*.

Is more eſpecially remarkable for its affinity with *Lime*, with which it produces an inſoluble compound.

Would appear to conſiſt of the ſame elements with the former *Acids*, but in different proportions.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Uſed to take out *Iron-moulds*, and as a teſt for diſcovering the preſence of *Lime*.

Of Gallic Acid.

Obtained from *Infuſion* of *Galls*, by continued expoſure to *Air*, edulcoration of the *Precipitate* which takes place, and ſubſequent *Cryſtalliſation*.

Forms

Forms ſmall granular or needle-like *Cryſtals*, of a ſour but not aſtringent *Taſte*.

More ſoluble in *Spirit* than in *Water*.

Burns in the open fire, leaving behind a hard inſoluble *Charcoal*.

In cloſe veſſels, yields an *acid Liquor* and a *whitiſh ſaline Sublimate*.

A ſimilar ſalt procurable from Galls, by *ſimple Diſtillation*. This alſo called *Gallic Acid*.

Remarkable for the property of producing a black colour with *Iron* and its ſolutions; hence the formation of *Ink*.

Hydro-carbon probably the baſis of both theſe forms of *Gallic Acid*, but united with different proportions of *Oxygen*.

Of Citric Acid.

Obtained from the juice of *Lemons*, *Citrons*, and other fruits, by a proceſs ſimilar to that employed for the preparation of *Tartareous Acid* from the *acidulous Tartrite of Potaſh* by *Lime*; or by congelation on expoſure to intenſe degrees of *Cold*.

Form

but if it be employed in small quan=
tity, the colour is a purple, & this is ye cause
of the colour of chalybeate springs, & hence
this acid becomes a test of ye chalybeat
quality of water which is in proportion
to the change produced on the addition
of the Acid of the infusion of Galls

Citric Acid

Saturate the Juice of the lemon &c. with
Lime in order to seperate the mucilage,
then by the addition of Sulphuric acid,
which unites with the lime, you ob=
tain the pure Citric acid which sh.
be chrystalized; This is the method pro=
pound by Mr. Scheele & is a very ex=
cellent one, as the acid no longer suffers
from age; Another mode of increas.
the acidity or rather of obtaining

the acid in its lower state is to prev
the aqueous part -

Form *concrete*. *Cryſtalliſable*.

Not ſubject to alteration by keeping. Forms particular compounds with the *Alkalis* and moſt of the *Earths*.

Action on *Metals* not remarkable.

Convertible by means of the *Nitric*, into *Oxalic* or *Acetic Acid*.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Uſes, in the more common form, in *Diet* and *Medicine*.

Of Malic Acid.

Obtained from the juice of *Apples*, and other *Fruits*, by ſaturating it with *Potaſh*, adding to the compound a ſolution of *Acetite of Lead*, and decompoſing the *Malate of Lead*, thus produced, by *diluted Sulphuric Acid*.

Form *liquid*. Taſte *agreeably acid*.

In union with *Alkalis*, forms *deliqueſcent Salts*. Unites alſo with moſt of the *Earths*.

Upon *Metals*, excepting *Iron* and *Zinc*, has no remarkable effect.

Is eafily convertible into *Oxalic* or *Acetic Acid*, by treatment with the *Nitric*.

Confidered as intermediate between *Tartareous* and *Oxalic Acid*.

Of Benzoic Acid.

Obtained in the dry way, by fublimation from *Gum Benzoin* (*Flores Benzoes* P. L.); or, in the moift way, by mixing and boiling it with *Lime*, filtering the liquor, and adding *Muriatic Acid*.

Form *minutely cryftalline*. Tafte *indiftinctly acid*.

Soluble both in *Water* and *Spirit*, alfo in different *Acids*, and without being decompofed.

Melts in *clofe Veffels*; and burns in the *open Fire*. Unites into cryftallifable compounds with the *Alkalis* and fevera' of the *Earths*.

Neither the *Order of Attraction*, nor the *Compofition* of this acid, as yet fufficiently afcertained.

of Benzoic Acid

In subliming the Gum Benzoin after the first sublimation submit it to a considerable degree of pressure by means of plates & screws in order to press out the Empyreumatic oil & then repeat the sublimation.—

Pyro-lignieous Acid

It is most economically obtained on a large scale from the distillation of Tar, it is a solvent of the oxyd of Iron & if to this an infusion or decoction of any of the astringent vegetables be added, a black, blue, or purple colour is produced which is employed extensively in the art of Dying cloth; the acid of tartar or vinegar would answer the same purpose of course would be efficacious & the mineral acids would be destructive to the texture of the materials.

Of Pyro-ligneous Acid.

Obtained by diſtillation, from *Birch*, *Beech*, and many other woods.

Form *liquid*. Taſte *acid*. Specific gravity 49 to 48.

Decompoſes in the open *Fire*.

Unites with *Alkalis*, *Earths*, and *Metals*.

Order of Attraction, *Lime*, *Baryt*, *Potaſh*, *Soda*, *Magneſia*, *Ammoniac*, *metallic Oxyds*, *Alumine*, *Water*, *Spirit*.

Radical of this acid *Hydrogen* and *Carbon*.

Of Pyro-mucous Acid.

Obtained by diſtilling *ſaccharine Subſtances* in a ſtrong heat; rediſtilling the liquid product, and afterwards concentrating it by *freezing*.

Taſte *very penetrating*. Colour *yellowiſh*.

Unites with the *Alkalis*, *Earths* and *Metals*.

Order of Attraction, *Potaſh*, *Soda*, *Baryt*, *Lime*,

 Magneſia,

Magnesia, Ammoniac, Alumine, metallic Oxyds, Water, Spirit.

Consists chiefly of water and oil slightly *oxygenated.*

Convertible by the *Nitric,* into *Oxalic* or *Malic Acid.*

Of Camphoric Acid.

Obtained by the distillation of *Nitric acid* from *Camphor.*

Forms *silver-white parallelopiped Crystals.* Taste *bitterish, sour.*

Soluble in *Water,* insoluble in *Spirit.*

Unites with the *Alkalis, Earths,* and *Metals.*

Thought to have the same basis as *Oxalic Acid.*

The *animal Acids* are, the *Phosphoric, Lactic, Saccho-lactic, Formic, Prussic, Sebacic, Lithic,* and *Bombic.*

Of

Of Camphoric Acid

The camphor is an highly inflammable substance yet it dissolves quiescently in the Nitric Acid without heat in which it differs from other Inflammable substances, as essential Oils, but which it much resembles in other respects; but if the solution be submitted to heat, the camphor assumes acid properties by uniting with the oxygenous principle of the nitrous acid.

Of Phosphoric Acid

This Acid is found in the bones of Animals, in lime & many other minerals, &c. See Article Phosp. p. 124 seq. & is extremely inflammable it is obtained by simple combustion of the substances into which it enters, in long exposure to air, by which it entes, in long exposure to air, by which it takes in large quantity of oxygen, which while it increases its bulk communicates to it

acid properties; or, by solution of the substances in the nitric acid by the assistance of heat, by which the phosphorus burns rapidly, & if this be distilled in a retort, all the residue is the acid of phosphorus, the phosphorus uniting with the oxygen of the nitric Acid. If the acid of Phosphorus be totally decomposed it is reduced to the state of Carbonic acid gas —

Of Phosphoric Acid.

Sources of this acid various. Modes of obtaining it various also. Usually procured from common *Phosphorus*, by deflagration; or by slow combustion, under long exposure to air; or by treatment with the *Nitric Acid.*

Crystallises into quadrangular *Prisms.* Taste *acid*, but not *corrosive.* Specific gravity 2,687.

Has a strong attraction for *Moisture*, producing heat.

Under the application of the higher degrees of *Heat*, fuses into a transparent *Glass.*

With the *Alkalis*, *Earths*, and *Metals*, forms particular compounds. With *Soda*, *Phosphate of Soda* (*Soda Phosphorata* P. Edin.). With *Silex*, in the dry way, a deliquescent glass. With *Iron*, *Phosphate of Iron (cold short Iron).*

May be partially or totally decomposed, by treatment with different *inflammable Substances.*

In distillation with *Charcoal*, reproduces *Phosphorus*; this therefore considered as its *Radical.*

Order of Attraction, *Lime, Baryt, Magnesia, Potash, Soda, Ammoniac, Alumine, metallic Oxyds, Water, Spirit.*

Of Lactic Acid.

Obtained from *sour Whey*, by evaporating it to a certain point, filtering, adding first *Lime-water*, and afterwards *Oxalic Acid*, separating the *Oxalate of Lime* by decantation, evaporating the decanted liquor to the consistence of honey, dissolving in *Alcohol*, adding *Water*, and drawing off the spirit by distillation.

Form *liquid.*

Easily decomposed by *Heat.* With the *salifiable Bases* forms compounds which do not crystallise.

Would seem analogous to *Acetous Acid.* Order of Attraction the same.

Of Saccho-lactic Acid.

Obtained from *Sugar of Milk* and other substances, by treatment with the *Nitric Acid* in a similar manner to that employed in the preparation of *Oxalic Acid.*

Form

Lactic Acid

is obtained from the Sour serum of milk &c. It is applied to no particular use

Saccho Lactic Acid

The Sugar of Milk is obtained in a powdery form by simple evaporation, & if the Nitric Acid be poured upon this expectedly a concrete Salt is produced.

Formic Acid

If you deliver a vast of these ac
in summer a pungent acid Gas
which is found to stimulate the Eye
Nostrils –

Form *pulverulent*. Colour *white*.

Sparingly ſoluble in *Water*.

Decompoſed by expoſure to *Heat*.

Forms cryſtalliſable compounds with the *Alkalis*; but with the *Earths* and *metallic Oxyds*, ſuch as are inſoluble in water.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Of Formic Acid.

An acid liquor ſecreted by *Ants*, more eſpecially the *Formicæ rufæ Lin.* May be collected by expreſſion; or cautious ſimple diſtillation; or by infuſing them in *Water*, or *Spirit*, and ſubſequent diſtillation of the liquor, which may be concentrated by expoſure to *Cold*.

Has a *pungent Smell*, and when diluted, a taſte *agreeably Acid*.

Forms particular compounds, with the *Alkalis*, *Earths*, and *metallic Oxyds*.

Order of attraction, *Baryt, Potash, Soda, Lime, Magnesia, Ammoniac, Alumine, metallic Oxyds, Water, Spirit.*

Of Prussic Acid.

Obtained from *Prussiate of Iron (Prussian Blue)* by boiling it in a solution of *Potash*, adding *Sulphuric Acid* to the liquor when filtered, and submitting it to distillation; or by distilling a mixture of *Prussiate of Potash*, and diluted *Sulphuric Acid*, and redistilling the product from *Carbonate of Lime.*

Form *gaseous.*

Unites readily with *Water.*

Combines with *Alkalis, Earths,* and *metallic Oxyds.* With *Oxyd* of *Iron* reproduces *Prussian Blue.*

Consists of the same elements as *Carbonate* of *Ammoniac.*

Order of Attraction, *Potash, Soda, Ammoniac, Lime, Baryt, Magnesia, metallic Oxyds, Water, Spirit.*

Of

Prussic Acid

Prussian Blue or Prussiate of Iron
is prepared by adding to a quantity of Dried
Blood or the shavings of the horns or
hoofs of Animals some potash in an
Iron pot & fluxing them by a necess-
ary degree of heat. The brownish mat-
ter left behind is to be diluted with water
to which also is to be added a solution of
Blue vitriol & Alum, which is to be
filtered in order to obtain a substance
in question, from which a peculiar
acid by distilling it with sulphuric
acid & carbonate of Lime. This acid
by uniting with the oxyd or with
any of the other soluble forms of Iron

always produces a delicate blue colour which therefore is another test of the presence of Prus. in a soluble form I w[illegible] commonly use the Acid in the form of the Precipitate of lime. This has been considered as a very curious subject & has been fully treated of by Macq[illegible] Scheele, Bergman & others. This acid does not preexist in any of the materials used for its production, for if the coal be put into an earthen or glass vessel & be made red hot & ammonia gas passed thro it, if the elastic matter be evolved & collected, it will be found capable of producing ppt. prussian blue with oxyd of Prus., therefore we believe it to be the same as the carbonate of lime, –

Sebacic Acid or Acid of Fat

Animal Fat is used extensively in the manufacture of Soap & it is found that if fat be rancid before it is boiled with caustic alkaline matter it produces less quantity of Soap than when recent; rap there is a mixture of expressed animal Oil & alkali & commonly caustic mineral alkali is employed for the purpose. The difference of Fat with respect to its purity depends the extrication of a large quantity acid matter which destroys a proportion the Alkali; a quantity of caustic Alkali is also produced by the process & which makes a considerable article in trade. The id is also obtained from unctuous vegetable oils by simple distillation

Lithic Acid

This acid was discovered by Schele. It is nearly insoluble in water. Since the discovery it has been supposed that the urinary calculi are formed by this acid but the quantity procured from such calculi is very various & there is no so[illegible] of correspondence amongst different calculi & we are confident that if Schele had examined them he would not have written so superficially on them for this is the least satisfactory of all his essays —

Of Sebacic Acid.

Obtained from *animal Fat*, by ſimple diſtillation, or in a more pure form by melting *fatty Matter* with *Lime*, boiling the mixture in *Water*, and decompoſing the cryſtalliſable ſalt *(Sebate of Lime)* thus procured, by the addition of *Sulphuric Acid* and ſubſequent diſtillation.

Form *liquid*.

In ſeveral reſpects analogous to the *Muriatic Acid*.

With the *Alkalis*, *Earths*, and *metallic Oxyds*, forms peculiar compounds.

Order of Attraction, *Lime*, *Baryt*, *Magneſia*, *Potaſh*, *Soda*, *Ammoniac*, *Alumine*, *metallic Oxyds*, *Water*, *Spirit*.

Of Lithic Acid.

Obtained from the ſimple diſtillation of *Urinary Calculus*.

Form *concrete*.

Difficultly

Difficultly ſoluble in *Water*.

Forms with the *Alkalis*, *Earths*, and *metallic Oxyds*, compounds as yet but little known.

Of Bombic Acid.

Obtained by expreſſion, or infuſion in *Alcohol*, from the *Silk Worm*, when in the ſtate of *Chryſalis*.

Form *liquid*. Taſte *penetratingly acid*. Colour *yellow*.

Combinations not yet examined.

Of Alkalis.

Diſtinguiſhed, by being of a pungent, lixivial, or urinous taſte, and changing moſt vegetable *blue* colours to *green*, and many of the *yellows* to *brown*.

Have, like moſt of the acids, a ſtrong attraction for *moiſture*.

They manifeſt alſo an extenſive diſpoſition to union

Alkaline Bodies

These are opposite in all their properties to
acids except in having a strong attraction for
moisture & their combinations are therefore
neutral, alkaline or acidulous according
to the proportions in which they are united.
The Alkalies are 6 in No. & on the application
of heat 2 of these are fixed & the other 4 volatile.
Upon the minutest attention we are at
present obliged to say that 2 of these are
simple & one compound, altho we suspect
~~that~~ they are not all compound. Some
believe that they derive their origin from
oily substances but we are not certain
of this & we rather consider them as simple
& has been imagined that they are pro-
ducts of heat or combustion, the vegeta-
ble & mineral alkali is we believe a
new substance actually generated as
would appear by many new experiments.
That the fixed vegetable is proved by ad-
ding to a solution of crystals of tartar any
other acid & we obtain from it a compounded

salt, the same as if the cream of tartar had undergone previous combustion & had saturated the alkali with acid, as the sulphuric acid, & product wd have been sulphat of Potash or vitriolated tartar; the alkali procured by the burning of the Cream of tartar will be more in quantity than be produced from any other decomposition. Alkalis are called Fixed because they have greater power of acting on a great variety of earthy substances than the volatile alkalis. Most kinds of glass are formed of flinty or quartz & of these alkalis. All the Alkalis unite with Sulphur & they render the sulphur more soluble & the compounds take the name of Livers of Sulphur, hence sulphur is dissolved in the water of springs for of itself sulphur is insoluble in water, & is now decomposed, the alkali having been decomposed.

The Alkalis combine with the metallic oxyds & unctuous substances as well as with the earthy bodies & render them soluble in water; with the unctuous they form saponaceous matter.

of Vegetable Alkali or Potash

The fixed alkalies differ very little in their manner of production. It is generally produced dissolving the ashes, which are the result the combustion of vegetable or woody matter, in water, filtering & evaporating the solution ~~[illegible]~~ so as to obtain the alkali in union only with carbonic acid gas in small proportion. Soda is obtained nearly in the same way by similar treatment of the Sea Weed or Kelp first burning the ashes & evaporating the solution to a certain point. Kali also proceeds from the carbonate of Potash by treatment with lime. Vinous liquors deposit tartar, which when calcined yields the fixed veget: Alkali in large quantity. In the neighbourhood of large cities where animal & vegetable matter is constantly undergoing putrefaction we obtain common nitre. Ammonia is procured in a similar way; all of them have a certain mixture of carbonic ~~acid~~ this renders them mild & are then said to be in the aerated or carbonate form, & when they are deprived of this air they

become caustic & are called lyes. The Pot
may be rendered caustic by the addition
of quick lime to them when dissolved in
water, the lime having a greater attract
for the carbonic acid than the alkali &
lime is restored to its original state &
alkali becomes caustic. The Fixed Alk
alkali have many properties in common
with each other, as colour, smell, attract
for acids, changing vegetable Blue to Gr
The caustic may be rendered mild ag
by exposure to air. The Carbonate of Po
is the Potash in its power state as we
it imported from America; when in a
power state it is termed Pearl Ash. The
=dom united with so little carbonic acid g
as to render it neutral. Solution of car
=nate of potash in water in a certain
=portion forms the Aqua Kali; but if the
made by the simple deliquescence of p
Sangitate it is much nearer the point of
=turation. This Potash w.h 40 times its g
=lity of well burnt quick lime & of add as
boiling water as will form a paste to

union with other bodies. With the acids, as before mentioned, they conſtitute *neutral Salts*.

With unctuous ſubſtances, they form *Soaps*.

They are uſually divided into *fixed* and *volatile*. The *fixed* ſubdivided into *vegetable* and *mineral*.

The *fixed* ſuſpected, the *volatile* known, to be compounded.

Of Vegetable Alkali. (Potaſh.)

Appears to be a conſtituent part of moſt vegetable ſubſtances, enters alſo into the compoſition of ſeveral ſaline minerals. Obtained from *Carbonate of Potaſh*, by treatment with *Lime*.

Form *concrete*. Taſte extremely *pungent*. *Cauſtic*. Colour *white*.

Has a ſtrong attraction for *moiſture*.

On ſolution in water produces an increaſe of temperature (*Aqua Kali puri* P. L.).

Fuſible in a moderate, and volatile in an intenſe, *Heat*.

Promotes the fuſion of *Earthy Bodies* and of *metallic*

metallic Oxyds; hence the preparation of different kinds of *Glaſs*. Unites readily with all the *Acids*.

Its more important compounds are,

1ſt. *Sulphate of Potaſh* (*Kali vitriolatum* P. L.), prepared uſually from the ſaline maſs, which remains after the diſtillation of *Nitric Acid*.—Form, *cryſtalline*.—Taſte, *ſaltiſh bitter*.—Difficultly ſoluble in water; alſo very difficult of fuſion.—May be decompoſed either in the moiſt way by *Baryt*, or in the dry way by calcination with *Charcoal*.—Application chiefly *medical*.

2d. *Nitrate of Potaſh* (*Kali Nitratum* P. L.) obtained in the Eaſt Indies and other countries by the elixation of certain ſoils, in which it is either already contained, or produced artificially by the addition of *Potaſh*.—Thoſe ſoils more eſpecially productive in which vegetable and animal matter have run into a ſtate of putrefaction.—Freed from extraneous ſaline matter by repeated cryſtalliſation.—Form of its cryſtals *priſmatic*.—Taſte, *cold*, *ſaline*, *penetrating*.—Much more ſoluble in hot than cold water.—In a moderate heat undergoes watery fuſion (*Salprunel*).—An increaſe of the heat produces a decompoſition

24 hours add more water & decant
filter the fluid thro sand or powdered
glass & you have the liq. kali puri, & wd
then evaporated down in a glass or silver vess.
l you have the concrete pure kali or lix
vis Potassalis, which may be made into
cakes by casting it in a crucible; their
deliquescent in the atmosphere have a strong
attraction for moisture & is by far the purest
most active form of the vegetable alkali
may be rendered mild by recalcining it.
This is a case of double electrive attraction,
the lime giving the alkali caloric & take
on it fixed air. But the same may
done by applying heat to a sufficient
dist to the fixed alkali; all the chrys-
allized saline substances in solution
reduce cold, all the caustic energise on
heat. The alkalis give glass particu-
lar tinges which are well known to
Metallurgist — Dr Blackburn throws
much light on this subject
All the 3 Alkalies combine with ed

Acids of which there are upwards of 20,
compounds of them in nature are many of
of no use. They unite intimately with
= silver & in union with unctuous substan
they form soap but more imperfectly
the mineral Alkali; the vegetable
is commonly used for the preparation of Soa
for medical purposes. The addition of
salt in the process of soap making pro
vegetable alkali produces an additional
quantity of alkali & makes the soap harder
The aerated veg: alk: is very useful in wash
ing & cleaning of metals &c. The baly ke
pearl is made of the vegetable alkali in
a particular proportion of quicklime
plastic form from the Veg. Alk: acetate
with Sulphuric acid, Kali nitri fla
with nitric acid Kali nitratum &c
are called acetates, sulphates, &c.
If the Kali acetatum be impure
like it must be dissolved in Sp. Vini, &
dissolves the Saline part & leaves it
pure. It is then of a whiter colour, &

more efficacious. It is certainly more diure-
than the other saline compounds but it
should be given in 3 times the usual quan-
tity or even 3j in Inf: Gent.e - Shale Ni-
trate, common or prismatic nitre
called in contradistinction to quadrangu-
lar nitre - It is procured from the union
of Veg: Alkali with nitric acid, or from
the residuary matter of the acidum nitro-
sum with the Alkali. It is imported
from the East Indies, Spain, France,
Portugal, &c. Common soil mixed with Ani-
mal or vegetable matter undergoing putre-
faction produces the pure or Calcareous Nitre
which is readily decomposed by an addition
of common salt, alkali or lime provided it
not too much diluted by rain - It is
more abundant in old stables of bullocks, &
dunghills, for obvious reasons, but in
the East indies it is found in large tracts
of country remote from towns & may
be procured by dissolving the earth in water
& let by for repeated evaporation &
solution & crystallization, but it

is imported into this country it is impure
from admixture of heterogeneous matter
calcareous nitre or magnesia, lime &
=mon salt & is called rough nitre being
confused chrystals. For medical purposes
Gun powder it requires purification which
is as regularly conducted in this country
charging of Gold & Silver by Government and the
process of the shooting of the chrystals on
large scale is very beautiful. This salt
unaffected by exposure to air, more so
in hot than cold water; solution purge
cold, exposed to moderate heat undergo
watery fusion, liquifying & is decomp
leaving little behind but the vegt. alk
which constitutes its basis, & this on
the evaporation of the nitric acid but
decomposition of it, consisting of very pure o
or dephlogisticated gas, the addition of which
renders it more luminous. But if inc
exposed to excessive heat, as by boiling
melted over it, the nitric acid undergo
decomposition producing a strong con
leaving behind only pure Vegt. Caustic
which was of pure alkaline base of

compoſition of its *Acid*; the *Alkali* remaining unchanged.—May be more readily decompoſed by the addition of *Charcoal* or other inflammable matter; hence the preparation of *Gun-powder*.—When decompoſed in the moiſt way, by treatment with the *Sulphuric*, furniſhes *Nitric Acid*.—Uſed extenſively in *Glaſs-making*; *Metallurgy*; preparation of *Gun-powder*; and for *dietetic* and *medical* purpoſes.

3d. *Acidulous Tartrite of Potaſh*, prepared from *crude Tartar* (the ſpontaneous depoſite from new wine) by ſolution, and evaporation (*Cremor Tartari* P. L.), or by cryſtalliſation under cooling (*Tartari Cryſtalli* P. L.).—Form *cryſtalline*.—Taſte agreeably *acid*.—Of little ſolubility in *Water*.—Decompoſed by the application of *Heat*; chief products, *Pyro-tartareous Acid*, and *Carbonate of Potaſh*, therefore called *Salt of Tartar*.—Of various application in the arts, as in *Tinning*, *Dying*, *Hat-making*; employed alſo extenſively in *Medicine*.

4th. *Tartrite of Potaſh* (*Kali Tartariſatum* P. L.), prepared from the ſolution of the former, either by precipitating its exceſs of acid, by means of *Chalk*, or by ſaturating it with additional

Potaſh.

Potaſh.—Form, *cryſtalline.*—Taſte *ſaltiſh-bitter.*—Attracts moiſture from the atmoſphere; alſo very ſoluble in *water.*—Decompoſed by heat, nearly in the ſame way as the *Acidulous Tartrite of Potaſh.*—Employed only in medicine, as a *mild Cathartic.*

5th. *Acetite of Potaſh* (*Kali Acetatum* P. L.) prepared by ſaturating *Potaſh*, with *Diſtilled Vinegar*, evaporating to dryneſs, melting the remaining maſs, diſſolving it in water, filtering and evaporating a ſecond time.—Form, *flaky.*—Colour, *white.*—Taſte *pungent.*—*Deliqueſcent.*—Eaſily ſoluble both in *Water* and *Spirit.*—Its acid decompoſed in diſtillation.—Yields *Acetic Acid*, on the addition of the *Sulphuric.*—Uſed in medicine as a *Diuretic.*

6th. *Carbonate of Potaſh* (*Kali Præparatum* P. L.) uſually obtained from the aſhes of vegetables by lixiviating them in water, decanting, and evaporating to dryneſs.—Form *powdery.*—Taſte, *urinous.*—Colour, *pearly-white.*—*Deliqueſcent* in a moiſt atmoſphere (*Aqua Kali* P. L.); may then be cryſtalliſed after cautious evaporation.—May be decompoſed in the moiſt way by moſt of the other *Acids*, or by *Lime*, and in the dry way by the ſimple application of *Heat.*—

Uſes

tre; oxygen is also procured from nitre by di-
stilla- as well as from heating the oxyd of
manganese, & on this decomposition depends
the fulminating power of gun powder, wch
composed of a mixture of sulphur, nitre &
charcoal; if the formula of these be settled
two shows exhibit nearly the same
effects, depending on the ready decomposition
of of nitric acid & the evolution of oxygen;
as the compounds of nitre burn in va-
cuum from the same principle, viz of the com-
ation of sulphuric acid. The proportions
the ingredients for gun powder are not ac-
curately or uniformly adhered to in diff. coun-
tries. The effects seem very much to de-
end on the intimate mixture & best wd
harcoal procured from wd different kinds
Wood as it was supposed formerly; altho
it is power if procured from
Wood; the charcoal must be well prepa-
d & all the articles of greenly well pounded.
The charcoal for this purpose is therefore to be
baked in iron cylindrical crucibles affordd
as much heat as it can bear & this fol-
kept up for a long time. It is potashed by

falling of particles rub on each other forming
a kind of rude process & it is then called Gun
powder - See Dr Watson's Essays on the
head - The Pulvis Fulminans consists of 6
Alkali nitre & sulphur, after this is melt
it immediately explodes & it undergoes p
=ticular alterations of colour before it fin
first exhibiting a lime colour, gradually
=coming brown, depending on the exhal
=tion of Hepatic or sulphuric gas, (wch is
=flammable gas with oxygen holding in so
=tion sulphur - When vegetable alkali is
=premium & nitre cheap, the former is obta
=ined from the latter. Nitre is very so
=luble in water, generating cold & is therefore
employed for lowering the thermometer,
=ing to it a quantity of Sal. Ammoniac
affects this quality very much in the W. I.
is employed for cooling Liquors - Nitre
markably lowers the pulse when taken
internally & abates thirst; 8 or 10 grains
are a sufficient dose for most stomachs can
but we have seen some bear a Drachm &
times in 24 hours, when in a habit of
=ing it & it is probable that this dose dis
in a hot climate & consequently water would be ope

ly useful in acute Rheumatism & many
r inflammatory complaints. It is certainly
ownerful antiseptic & when mixed with com.
it gives animal substances a red colour.
The Quadrangular Nitre is obtained from
mineral alkali & nitric acid. The acidum
itrosum is procured in the moist way fr.
decomposition of sulphuric acid & nitre.
Acidulous Tartrite of Potash is
tained from the deposit or incrustation of
ine in the vessels containing it, hence it
perness of crude Tartar, cream of Tartar
according to the colour of the Wine, this
atter to be dissolved in Water & set by for
rystalization. The chrystals differ from
cream in being deprived of the water, of
rystallization in a diff. manner as speci-
ed in the Pharm. Lond. The Cream has
ways the acid in excess; it dissolves very
le in water, which excess is removed by ad
ition of chalk or potash dissolved in water
allowing it to precipitate & evaporating
e supernatant liquor in a clean glass or
ilver vessel we have the Tartrite of Po-
sh in a concrete form, but if chrystallized

with difficulty - The Chlorides & cream of tar are very useful in abating heat & thirst & are both purgative & diuretic. Tartrite of Potash is the same mixture saturated, point of neutrality.

Of Mineral Alkali, Mother of Soda

— It is chiefly found in the form of Sal Gem, it is the basis of common salt is therefore called muriate of Soda. an at inconceivable quantity of it is held in solu in the water of common springs & sea wa & many mines in this country are hard almost entirely of it in Cornwall, there are nothing compared to those of Pola there are many labourers spend their wh lives in the mines. To procure it in its or caustic form take the impure carbo of soda & heat it with quicklime in 80 times the same quantity, when it gi out its carbon & attracts the calorie; i form taste & causticity, &c. nearly the sa as vegetable alkali or potash & ach same manner as similar substances makes more perfect soap than vege

Uſes various, as in *Glaſs-making*, *Bleaching*, *Metallurgy*, *Medicine*, &c.

The order of attraction of this alkali in the moiſt way, *Sulphuric Acid*, *Nitric*, *Muriatic*, *Sebacic*, *Fluoric*, *Phoſphoric*, *Oxalic*, *Tartareous*, *Arſenic*, *Succinic*, *Citric*, *Formic*, *Lactic*, *Benzoic*, *Acetic*, *Saccho-lactic*, *Boracic*, *Sulphureous*, *Nitrous*, *Carbonic*, *and Pruſſic*, *Water*, *Unctuous Oils*, *Sulphur*, *Metallic Oxyds*; in the dry way, *Phoſphoric Acid*, *Boracic*, *Arſenic*, *Sulphuric*, *Nitric*, *Muriatic*, *Sebacic*, *Fluoric*, *Succinic*, *Formic*, *Lactic*, *Benzoic*, and *Acetic*, *Baryt*, *Lime*, *Magneſia*, *Alumine*, *Silex*, *Sulphur*.

In ſolution ſometimes preſcribed internally; in the concrete form frequently employed as a *Cauſtic*.

Of Mineral Alkali. (Soda.)

Found in great abundance in the mineral kingdom, particularly in combination with *Muriatic Acid*.—Obtained in a ſeparate form, from *Carbonate* of *Soda*, by means of *Lime*, as in the caſe of *Potaſh*, from *Carbonate of Potaſh*.

Its

Its form, colour, taste, causticity, &c. nearly the same with those of the former alkali.

Acts also powerfully on the *Earths* and *metallic Oxyds*, and unites readily with *unctuous Substances*.

Its more important saline compounds are,

1st. *Sulphate* of *Soda* (*Natron Vitriolatum* P. L.), obtained by solution and crystallisation from the matter left behind in the preparation of *Muriatic Acid*, *Muriate of Ammoniac*, or *Muriate of Quick-silver*. Form of its crystals, *prismatic*.—Taste, *bitter*.—Effloresces on exposure to *Air*.—Readily soluble in *Water*.—When exposed to *Heat* undergoes watery fusion. May be decomposed in the same way as *Sulphate* of *Potash*.—Used only as a *Cathartic*.

2d. *Muriate of Soda (Common Salt)* obtained by evaporation from *Sea Water*, or the water of *saline Springs*, or the solution of *Rock Salt*, which is found in great abundance.—Form of its crystals *cubical*.—Taste, agreeably *saline*.—Equally soluble in hot as in cold *Water*. Soluble also in *Spirit*.—Decrepitates on sudden exposure to *Heat*. Melts in a red heat without decomposition. By

ever its difference from of Veg: Alk. which is
markable. Medical Soap is prepared from Pot-
h but common Soap from Natron, united
th unctuous matter but more especially
th animal Oil or Fat, common salt is
ded to the lixivium for this purpose, to give
greater hardness & which probably increases
quantity of mineral alkali. The Pulp
Sea weed is often used for making Soap
ding previously burnt, but this contains
me vegetable alkali which decomposes
common salt, producing more mine-
l Alkali & therefore a more perfect Soap.
Sulphate of Soda The form. of of
mplete of this salt is altogether accidental
in of general extemporaneous way of
aining it from of matter left behind in
e sublimation of Corr. Sublimate, esp.
al Ammoniac & Phosphatic acid. The
ste is much like that of of Potash Sul-
hurat. The above recited very substances
uitting the mineral alkali by single
d double elective attraction. Attempts have
en made to decompose this salt in order

to ~~obtain the alkaline~~ base by addi-
-on of a quantity of coal, by which a liv-
sulphur is produced, by means of a rafe-
-mable principle. It is the cheapest of
the saline compounds & the most ea-
of solution; the action of heat dissolves it
its own water of crystallization only. It
is probably but little difference in the
action of all the saline cathartic s.
Muriate of Soda common cal-
-ry or Sea Salt. The quicker slowly & ca-
-ously the evaporation of its solution is co-
-ducted the more pure are the crystals
the evaporation may be effected by simp-
exposure to the dry atmosphere or to heat
the sun, in this country it is done fo-
by exposure to the latter & then fires
in Cheshire. Bay salt has of longest
pured crystals & is the cheapest kind
is procured usually by exposure to the su
extended on a large dry soil as that of
clay field, near the sea side, mak-
platforms of the earth impenetrable

which is decomposed by the heat the
crystals shooting at the bottom, form.g
a fine mass in the state of crystallizing
in running together, exclude all the for-
eign matter, maintain.g their own pro-
perties if not mixed with substances wch.
are decomposed. If a quantity of concentra-
Brine be suffered to evaporate slowly,
the crystals appear, the particles have
time to arrange themselves naturally.
At Lymington this salt is procured from
solution of Sal Gemma which is found
there in great abundance in union with
sea water & strata of earth, & few mine-
ral substances are in greater abundance.
So extensive are the strata of this in Po-
land & so long has it been worked there
that we are forbidden using the Sal Gemma
in an act of Parliament. The best way of
purifying this salt is to boil the brine
or a solution of it in cold water then pour
in more salt, when the water will take
up the muriate of Lime &c. which are more
soluble in hot water & leaving the salt much

more pure, If Nitre & common Salt be mix
& dissolved, as they have no chemical aff
on each other, the 2 Salts will be separated
their own properties. In some parts of the
country, the fire being allowed to go out
manufactory on saturday night the sal
formed more pure on sunday than on
other days, for the colour & size of its cry
tals vary in diff. Specimens of the Salt, d
ing on the slowness or rapidity of vapo
on & crystallization. That which
lower is vulgarly called Rochel Salt, It
soluble alike in water & Spirit of Wine,
gives us an advantage in making the an
sis in springs, highly rectified Spirit of wine
separating many saline substances. It
precipitates in the fire from the sudden con
ration of its water of crystallization, th
saline matter requiring cause explosion
it holds so much a quantity of the water
crystallization that it is not sufficient th
solve it & consequently its particles burst
asunder. It melts in a red heat without
composition, hence its use in flaxing m

being intenſely heated may be converted into vapour.—Promotes the fuſion of many of the *earthy* and *metallic* bodies.—May be decompoſed in the moiſt way by *Sulphuric* and *Nitric Acids*; and in the dry way, by the *Phoſphoric*, *Boracic*, and *Arſenic*.—May alſo be decompoſed by *Oxyd* of *Lead*; hence the preparation of *Patent Yellow*.—Of extenſive application in *Agriculture*, *Glaſs-making*, *Glazing*, *Metallurgy*, *Soap-making*, *Diet*, *Medicine*, &c.

3d. *Phoſphate of Soda* (*Soda Phoſphorata* P. Edin.) Obtained by uniting *Phoſphoric Acid* and *Soda* to the point of ſaturation, evaporating, and cooling. Form *cryſtalline*.—Taſte not unpleaſantly *ſaline*.—*Effloreſcent*.—Diſſolves readily in *Water*.—Forms a triple ſalt with *Ammoniac*, (*Sal Microcoſmicus*).—Lately introduced as a *cathartic*.

4th. *Tartrite of Soda* (*Natron Tartariſatum* P. L.) Obtained, by evaporation and cryſtalliſation, from the union of *Soda* with *Tartareous Acid*, by adding to a ſolution of the former *Acidulous Tartrite of Potaſh*.—Form of its cryſtals, *priſmatic*.—Taſte *bitteriſh ſaline*.—In moſt of its properties, and in its application, analogous to the *Tartrite of Potaſh*.

5th. *Borate of Soda*, (*Natron Boracicatum* P. L.) Obtained in an impure form from the ſpontaneous evaporation of the water of certain lakes in the kingdom of *Thibet*; ſaid alſo to be found in *South America*.—Purified by ſubſequent ſolution, boiling, and cryſtalliſation.—Form of its cryſtals, *priſmatic*.—Taſte *ſtyptic*.—Readily ſoluble in *hot Water*.—Changes vegetable blue colours to green.—When heated, parts with its water of cryſtalliſation, and melts into a tranſparent *Glaſs*, which efflioreſces on expoſure, and may be again diſſolved in water.—Serves as a flux for all the *Earths* and moſt of the *Metallic Oxyds*.—May be decompoſed in the moiſt way, by the *Sulphuric*, and ſeveral other acids; in the dry way, by the *Phoſphoric* only.—Employed chiefly in *Metallurgy*, and *Glaſs-making*.

6th. *Carbonate of Soda*, (*Natron Præparatum* P. L.) Found native in the iſland of *Teneriffe*, *Egypt*, and elſewhere. Obtained alſo from the aſhes of certain marine plants, by elixation, evaporation, and cryſtalliſation.—Form of its cryſtals, *octohedral*.—Effloreſces on expoſure to *Air*.—Its other properties and uſes nearly ſimilar to thoſe of *Carbonate of Potaſh*.

Order

shutting out the common air; hence also
use in glazing earthen ware by merely
ing projected into the furnace containing
earthen ware, when red hot, by which the
salt is rendered vaporific & fusing the super-
ficies of the vessels it glazes them. From
difference in its action in the dry way &
moist way may be seen the great difference
its electrical attraction. It is decomposed
the oxyd of Lead taking up the oxygen &
ving out mineral alkali & with the same
it yields the Patent Yellow in a crucible
the following process, pound com.^n salt
th oxyd of Lead, wch is the com.^n mini-
nium of a shop, & dissolve this muriate
Lead in water, when a precipitation en-
mass which being melted is the production
metric, important only on account of its
durability of colour. The use of Salt in
agriculture was discovered by Sir John
Pringle, who found that a small
quantity of it was powerfully septic
to animal & vegetable matter, while
it proves antiseptic when employed in

greater quantity; com.^n Sand usually contains a certain quantity of salt. The its power of fertilizing many soils by com. many substances. The Sal gem or rock salt, which is the most abundant source of the com.^n salt, differs in its com.^n appearance or purity, it is sometimes transparent in fragments which are generally cubical, generally is very transparent when white pure, but it receives different tinges from a-ty of mixture, when combined with oxyd of it is reddish, sometimes it is of a brown colour given by earthy matter, sometimes of a deep blue, when taken internally in small quantity it is a moderate stimulant, in large proportion it is both emetic & cathartic

Phosphate of Soda, This is another product of the mineral alkali in combination with phosphoric acid to the point of saturation set by to crystallize, it then becomes transparent, & at length losing water of crystallization it becomes coated & in this state is the most powerful & which depends on the ~~crystallization~~ capability

This compound is more grateful to the [illegible] other saline cathartic

is not more than 1.6 p.m.; it is very spa-
ble in water. Tartrate of Soda or
Rochelle Salt is obtained from the solution
of Cream of Tartar with enough mineral
Alkali to saturate the superabundant acid
in the preparation of Tartrate of Potash, to
evaporated down to crystallization. It is
a question here whether we have two salts pro-
duced from the two alkalies or whether the
Vegt: Alk: be not contained in it & we have
a triple compound & which we believe is the
fact, tho it is not allowed by other chemists,
the union of the vegetable & mineral Alka-
lies with the acid of Tartar. This salt is
one of the most elegant cathartics, not
parting with any of its water of crystal-
lization nor attracting any from the at-
mosphere by keeping. Carbonate Po-
tassa is imported in great abun-
dance from the East Indies, the Alkali
is rather in excess, & its refinement is kno-
wn to but few in this country. It is usu-
ful in giving tints to glass & in soldering,
as in uniting metals it reduces the oxydated
part, & by the heat employed keeps it in
a fluid state, thus supplying the pure

metal to come into contact with it; it is
little used in medicine except in Gargl.
Carbonate of Soda is obtained in a
similar way as the Kali preparation
or potash from the ashes of wood or the
flag; the sea flag therefore is only a va-
-ty of the same substance (alkali co-
-bined with Charcoal) as the burnt sp.
is a cheaper medicine for which sea sp.
is substituted for it now by many
The Saline compounds of vegetable
mineral fixed alkali are diff.t in their
-properties; their other compounds nea.
similar. The mineral Alkali is mo.
extensively employed in medicine esp.
-ally in the treatment of Scrofula,
the form of Carbonate of Soda in doses
℞ 1. ʒi twice or thrice in 24 hours it
-tors quickly into the circulation bein
discoverable in the Urine. AMMONI
-AC; is procured in its purest & most a
form (which is gaseous) by decompos.
common Cried. Sal Ammoniac by p
Soda or lime by the aid of heat, bein
their form combined only with the Muri

Order of Attraction, alſo, of this Alkali, the ſame as that of *Potaſh*.

Of Volatile Alkali (*Ammoniac*).

Obtained from the decompoſition of *Muriate of Ammoniac*, by *Potaſh*, *Soda*, or *Lime*.

Form *gaſeous*.—Smell extremely *pungent*.—*Cauſtic*. — *Azotic*. — Lighter than *Atmoſpherical Air*.

Is abſorbed both by *Water* and *Spirit*; by the former with great rapidity, producing an increaſe of temperature and bulk (*Aqua Ammoniæ Puræ* P. L.). *Ice* diſſolved in this fluid, on the contrary, produces cold.

Is in a ſlight degree *inflammable*.

May be decompoſed in various ways; as by expoſure to *Heat*, by the *Electric Spark*, in the reduction of *Metallic Oxyds*, by the diſtillation of *Nitrate* of *Ammoniac*, &c. yielding in ſome caſes *Hydrogen*, in others *Azotic Gas*, which gaſſes by particular modes of combination have been found to reproduce it, and are therefore conſidered as its elements. and 16 of hydrogen 1 of a. and 82 in Atmospheric air. The hydrogen in 1 to 32 — Thenard & Rouelle —

The principal ſaline compounds of this *Alkali* are,

1ſt. *Sulphate of Ammoniac.* Obtained by the union of *Sulphuric Acid* with *Ammoniac*, on the addition of diluted *Sulphuric Acid* to liquid *Carbonate of Ammoniac.*—Form, *cryſtalline.*—Taſte, *bitter, pungent.*—Eaſily ſoluble in *Water.*—*Fuſible. Volatile.*—Employed principally in the manufacture of *Muriate* of *Ammoniac.*

2d. *Nitrate of Ammoniac.* Obtained by ſlow evaporation, from the combination of *Nitric Acid*, and *Ammoniac.*—Form, *cryſtalline.*—Taſte *cool, bitter, urinous.*—*Deliqueſcent.*—Eaſily *fuſible.* Under cautious diſtillation, yields *Nitrous Gas, Oxygen Gas*, and *Water*; but detonates when ſuddenly heated.

3d. *Muriate of Ammoniac*, (*Sal Ammoniacus* P. L.) Found native in the neighbourhood of *Volcanos*; prepared alſo, in large quantities, in the dry way, by compounded chemical affinity, from a mixture of *Sulphate of Ammoniac* and *Muriate of Soda.*—Form *concrete.*—Taſte *penetrating, acrid, urinous.*—Readily ſoluble in *Water*, producing cold; ſoluble alſo in *Spirit.* Cryſtalliſes under evaporation into ſmall quadrangular

Priſms.

ric Acid hence this salt in its crude state
termed Ammoniaca Muriata, & this
ad has a superior attraction for the lime,
the simple application of heat is suff.
effect this decomposition, the water of
crystallization rendering the addition of
ore water unnecessary, as the salt has
a strong disposition to imbibe moisture in
all quantity however may assist the de-
composition (the glass vessels used for this pur-
se should be previously coated with luting.)
This the ammoniacal gas is readily ab-
sorbed by water & on mixing a little syrup
violets with it, the colour becomes green
this forms the Aq. ammoniacæ pura. The
receives heat either from the calcareous
salt employed or by the adventitious heat
the furnace & we imagine rather from
former. The gas is pungent to the smell
the condensation of it in water is also
ngent to the smell, & taste & is caustic.
The gas is noxious to respiration & inflamma-
, & hence it is said to be somewhat deadly
et that it is in some degree favourable to
flamation is shewn by gently immersing a
ighted Taper into it. Solutions of Sod. Ox.

alk: in water produce cold, while solution
in water generate heat. Changes all vege
blues to green, like wd other alkali, the g
somewhat lighter than atmospheric a
it is absorbed by Sp.t Wine & Wine as we
by water & the best mode of keeping it a
dissolved by Sp.t of Wine is ~~also~~ closely cork
which state it is fixe or caustic & form
Ammon & Sp.t Amm Comp.t If Ce
put into a vessel containing the ammo
acal gas, it is melted sooner perhaps
if thrown into a fire, because of wd dis
tion of the gas absorb water or vice vers
Dr Priestly also has shown that it is a
ly inflammable. The Electric spark &
alike decompose this gas. See Mr Bo
let on this subject. From wd mixture of
acid, powdered Tin & lime volatile alkali
a gaseous form is obtained, as was mo
under the head of Acetic Gas, the lime
neutralizing with wd nitric acid then gen
& which is not otherwise necessary in
experiment. The Sulphate of
MONIAC now was a basis for
Sal Ammoniac & is composed of wd

ch is used only for the preparations of crude
ammoniac, adding common salt, &
mixing them in an iron pot, in which pro=
this salt is thrown up & collected in an ear=
vessel, it is fusible, volatile & caustic,
crystallizes — Nitrate of Ammonia
This is an extremely pungent salt, which
ates when suddenly heated without the addi=
of any other substance, in the same man=
as nitre does with charcoal, if only thrown
a red hot crucible, the utmost caution is
ired therefore in its applications & prepara=
. Were it employed medically, being very
s of decomposition its effects would be like
e of common nitre, it has been supposed
the prosor salt to be employed in Pul=
onic complaints, supplying the potash of
air which is there wanting, but probably
will not give out the same gas in the
mach as in the crucible, nor may the
~~stomach~~ gas undergo ~~any such~~ changes in
stomach as has been supposed & in this
pect medical practitioners have erred egre=
ously on many important occasions.
Muriate of Ammoniac This is of
ost importance of the saline compounds of the

volatile alcali, by calcining them in cylin-
-cal furnaces connected by tubes to vessels
-containing water to condense the gas, forming a
impure spirit of hartshorn with sulphuric
acid, & plaster of Paris, selenite or gypsum
now employed for obtaining the sulphuric
this being a compound of lime & sulphuric
acid, adding to it some common salt which
yields on the one hand the muriatic acid
-nia & on the other Glauber's salt; the cap
-nostenum, consisting of oil, is used as
another part of the residuary matter is the
black, or if calcined into bone ash it forms
Cornu Bovinum, which is insolu-
-ble water & therefore employed in preparing
the Decot. Cor: Cervi of the Ph. Lond; a
oxyd of Iron is also contained in the resi-
-duary matter which is a sort of Colcothar used
painting, &c & in part of the prepared
-form is wanted. A solution of the muri-
of ammon. in water produces a great
-ness of cold when com.d to salt or nitre
a mixture of Nitre & Muriate of Am-
-ia produces more cold than of ammo-
alone & for this reason such solution is
employed surgically applied either upon

Prisms.—Of extensive application in *Dying*, *Tinning*, *Soldering*, &c. used also frequently in *Medicine.*

4th. *Acetite of Ammoniac* (*Aqua Ammoniæ Acetatæ* P. L.) Prepared by saturating *Acetous Acid* with *Ammoniac.* — Form, *liquid.* — Taste *urinous.*—Employed as a *diaphoretic*; sometimes also used externally as a *discutient.*

5th. *Carbonate of Ammoniac* (*Ammonia præparata* P. L.) Obtained by distillation from most animal, and some vegetable and mineral substances; or from the decomposition of *Muriate of Ammoniac*, by *Carbonate* of *Potash* or of *Lime.* Form *concrete.* — Smell, *pungent.* — Taste, *urinous.*— Very soluble in *Water* (*Aqua Ammoniæ* P. L.) Soluble also in *Spirit* (*Spiritus Ammoniæ* P. L.) With unctuous substances forms an imperfect *Soap* (*Linimentum Ammoniæ* P. L.) Like all the foregoing compounds may be decomposed by *Potash*, *Soda*, *Baryt*, or *Lime.*

Agrees nearly with the other *Alkalis*, in the order of its Attraction, both in the humid and dry way.

Of Earths.

Diſtinguiſhed by their *Brittleneſs*, *Fixity*, ſparing ſolubility in *Water*, *Inſipidity*, want of *Odour*, incapacity of communicating a tinge to *Glaſs*, and their ſpecific gravity not exceeding that of *Water* more than in the proportion of 5 to 1.

Theſe characters poſſeſſed more perfectly by ſome of the earths than by others; hence the diſtinction into *Saline* and *Inſipid*.

All the earths ſoluble in one or other of the *Acids*, and ſome in all.

Cannot be precipitated from their ſolutions by *Pruſſiate of Potaſh* or of *Lime*, as is the caſe with all metals, *Platina* excepted.

The earths at preſent known are *Baryt*, *Strontian*, *Lime*, *Magneſia*, *Alumine*, *Silex*, *Adamantine Earth*, *Jargon Earth*, and *Sidnean Earth*.

Of Baryt.

Found in combination, 1ſt. with Carbonic Acid, (*Carbonate* of *Baryt*); 2d. with Sulphuric Acid, (*Sulphate* of *Baryt*, *Baroſelenite*); or 3d. with Sulphuric

markably detergent on metallic bodies.
employed internally in medicine it has a
power of exciting absorption, more especially
when united with Vinegar & given internal-
ly it is one of the most powerful diuretics
we are acquainted with & has succeeded in
dropsy when all other remedies had failed
may be given in doses of 3 to 5i. —

Acetite of Ammoniac —

This is prepared by saturating the acetous acid
with common Ammoniac or a solution of
the carbonate of Potash in water. It easily
crystallizes. or it may be prepared by the
carbonate of Ammoniac obtained from
an animal or vegetable substance, but
that made from the muriate of ammonia
is the purest & when decomposed with
lime — but it is more common to obtain
this volatile Salt by decomposing the muriate
of Ammoniac with common chalk dissolved
in water with the assistance of heat, the chalk
retaining carbonic acid,

Sulphuric Acid, Silex, Sulphate of Alumine, Sulphate of Lime, and Petroleum, (*Liver Stone.*)

Obtained in a ſeparate ſtate, by the application of a ſtrong heat, from *Carbonate* of *Baryt* prepared artificially.

Form *pulverulent.* Colour *white.* Specific gravity 4.000.

Soluble in about 900 times its weight of water, communicating to it properties analogous to thoſe of *Lime-water.*

Infuſible.

Unites with the *Sulphuric Acid* into a compound requiring for its ſolution 40,000 times its weight of *Water.* With the *Nitric* and *Muriatic Acid* forms cryſtalliſable ſalts.

Melts with effervescence when mixed with *Borax* or *Microcoſmic Salt.*

Unites with *Sulphur* into a ſpecies of Hepar, (*Sulphuret* of *Baryt*).

Order of Attraction in the moiſt way, *Sulphuric Acid, Oxalic, Succinic, Fluoric, Phoſphoric, Saccho-lactic, Nitric, Muriatic, Sebacic, Citric, Tartareous, Arſenic, Formic, Lactic, Benzoic, Acetic, Boracic,*

racic, Sulphureous, Nitrous, Carbonic, and *Pruſſic, Water, Unctuous Oils, Sulphur*; in the dry way *Phoſphoric, Boracic, Arſenic, Sulphuric, Succinic, Fluoric, Nitric, Muriatic, Sebacic, Formic, Lactic, Benzoic,* and *Acetic Acids, Potaſh, Sulphur, Oxyd of Lead.*

The ſoluble forms of this earth remarkable, for their violent effects, when exhibited internally.

Uſed principally as a teſt for aſcertaining the preſence of *Sulphuric Acid.*

Of Strontian.

Found in combination with Carbonic Acid, *Strontheanite*; the expoſure of which to heat furniſhes the pure earth.

Moſt of the properties of this intermediate between thoſe of *Baryt* and *Lime.*

More ſoluble however than either, and remarkable for the property of cryſtalliſing into *tranſparent rhomboidal priſms.*

Attraction, the ſame as that of *Baryt,* as to order, but inferior to it in degree.

Of

Of Lime.

Found 1ſt. uncombined, *Native Quicklime*; 2d. in union with Carbonic Acid and Water, *Calcareous Spar*, *Marble*, *Lime-Stone*, *Chalk*, &c. 3d. with Carbonic Acid and Petroleum, *Swine-Stone*; 4th. with Carbonic Acid and Oxyd of Manganeſe, *Sidero-Calcite*; 5th. with Carbonic Acid and Carbonate of Baryt, *Baryto-calcite*; 6th. with Carbonic Acid, Carbonate of Magneſia, Iron, and Manganeſe, *Muri-Calcite*; 7th. with Carbonic Acid, Magneſia, Alumine, and Iron, *Schiefer Spar*; 8th. with exceſs of Carbonic Acid, Alumine, Magneſia, and Iron, *Dolomite*; 9th. with Fluoric Acid and Water, *Fluor*; 10th. with Phoſphoric Acid, *Apatite*; and 11th. with Sulphuric Acid and Water, *Gypſum*, *Selenite*, *Plaſter of Paris*.

Prepared for various purpoſes from *Carbonate of Lime*, by the continued application of a ſtrong heat.

Form *concrete* or *powdery*. Taſte *hot*, *pungent*, *cauſtic*. Specific gravity 2.3.

Soluble in about 700 times its weight of water (*Aqua*

(*Aqua Calcis* P. L.) Changes vegetable blue colours to green.

On being ſuddenly moiſtened, emits both *Heat* and *Light*, loſing at the ſame time its attraction of coheſion. The ſame takes place ſpontaneouſly on expoſure to *Air*. On further expoſure attracts Carbonic Acid from the Atmoſphere; hence the increaſe of hardneſs obſervable in *calcareous Cements*.

Though infuſible *per ſe*, promotes very powerfully the fuſion of all the other earthy Bodies.

Melts with *Borax* and *Microcoſmic Salt*, without effervescence. Melts alſo with *Oxyd of Lead*.

Forms, with the *Sulphuric Acid*, a compound of little ſolubility in water, *Gypſum*; with the *Nitric* and *Muriatic*, ſalts ſtrongly deliqueſcent.

With *Sulphur*, a calcareous Hepar; with unctuous ſubſtances, peculiar *Soaps*.

Suppoſed in many inſtances to be of animal origin.

Order of attraction in the moiſt way, *Oxalic Acid*, *Sulphuric*, *Tartareous*, *Succinic*, *Phoſphoric*, *Saccho-*

Saccho-lactic, Nitric, Muriatic, Sebacic, Fluoric, Arsenic, Formic, Lactic, Citric, Benzoic, Acetic, Boracic, Sulphureous, Nitrous, Carbonic, and *Prussic, Water, Unctuous Oils, Sulphur*; in the dry way, *Phosphoric, Boracic, Arsenic, Sulphuric, Succinic, Nitric, Muriatic, Sebacic, Fluoric, Formic, Lactic, Benzoic,* and *Acetic Acids, Potash, Sulphur, Oxyd of Lead.*

Used extensively as the basis of *Calcareous Cements, Plaster* and *Stucco*; in *Dying, Bleaching, Tanning, Sugar-baking,* and various other arts, besides its application in *Medicine.*

Of Magnesia.

Found 1st. in union with Lime and some Iron, *Calci-murite*; 2d. with Silex, Alumine, Lime, Oxyd of Iron, and Water, *Argillo-murite*; 3d. with Carbonic Acid, Silex and Iron, *Silici-murite*; 4th. with Silex and Alumine, *Talc*; 5th. with Silex, Alumine, Iron, and Carbonate of Lime, *Lapis Ollaris*; 6th. with Silex, Alumine, Iron, Air and Water, *Steatites*; 7th. with Silex, Iron, Carbonate of Lime, Alumine, Muriate of Magnesia, and Water, *Serpentine*; 8th. with Silex, Alumine,

mine, Lime, Iron, Air, and Water, *Chlorite*; 9th. with Carbonic Acid, Silex, Carbonate of Lime, Alumine, and Oxyd of Iron, in different proportions, *Asbestos*, *Amianthus*, *Suber montanum*, *Actynolite* and *Jade*; 10th. with Silex, Lime, and Oxyd of Iron, *Baikalite*; 11th. with the Boracic Acid, Lime, Silex, Alumine, and Iron *Boracite*; and 12th with Sulphuric Acid, *Sulphate of Magnesia.*

Prepared from a solution of this last, by the addition of *Carbonate of Potash*, and subsequent exposure of the washed earthy precipitate to a strong and continued heat.

Form *pulverulent*. Colour *pure white*. Taste *insipid*. Specific gravity about 2.3.

Requires for its solution 7900 times its weight of water.

Infusible without addition, even in the most intense degrees of Heat; but melts into a glass with *Lime*, *Microcosmic salt*, or *Borax*.

Unites with all the Acids. With the *Sulphuric Acid* regenerates *Sulphate of Magnesia* (*Magnesia Vitriolata* P. L.) With *Carbonic Acid*, Carbonate of Magnesia (*Magnesia Alba* P. L.)

Is a principal ingredient in the preparation of the finer kinds of *Porcelain.*

May

May be combined, in ſmall proportions, with *Sulphur*.

Order of Attraction in the moiſt way, *Oxalic Acid, Phoſphoric, Sulphuric, Fluoric, Sebacic, Arſenic, Saccho-lactic, Succinic, Nitric, Muriatic, Tartareous, Citric, Formic, Lactic, Benzoic, Acetic, Boracic, Sulphureous, Nitrous, Carbonic,* and *Pruſſic, Sulphur*; in the dry way, *Phoſphoric, Boracic, Arſenic, Sulphuric, Fluoric, Sebacic, Succinic, Nitric, Muriatic, Formic, Lactic, Benzoic,* and *Acetic Acids, Potaſh, Sulphur, Oxyd of Lead.*

In common uſe in diſorders of the *Primæ Viæ* as an *antacid* and *laxative*.

Of Alumine.

Found united to, 1ſt. Carbonic Acid and Lime, *Lac Lunæ*; 2d. to Silex, *Clay*; 3d. to Silex, Carbonate of Lime, Carbonate of Magneſia, Oxyd of Iron, Air and Water, in different proportions, *Lithomarga, Fuller's Earth* and *Bole*; 4th. to Silex and Iron, *Tripoli*; 5th. to Silex, Oxyd of Iron, Manganeſe, Water and Air, *Lipidolite*; 6th. to Silex, Magneſia, Iron and Lime, in different proportions, *Sapari, Hornblende,* and *Baſalt*;

Basalt; 7th. to Silex, Magnesia, and Oxyd of Iron, *Mica*; without Magnesia, *Micarelle*; 8th. to Silex, Iron, and Carbonate of Lime, *Calp*; 9th. to Silex, Magnesia, Iron, and Petroleum, *Argillaceous Schistus*; and 10th. to Sulphuric Acid, *Sulphate of Alumine*.

Obtained in its purest form from a solution of *Sulphate of Alumine* (common alum), by the addition of *Potash*, *Soda*, or *Ammoniac*.

Form *powdery*. Colour, when dry, *pure white*. Feel *unctuous*. Taste *insipid*. Specific gravity 2.

Insoluble in *Water*. When moistened becomes plastic. Hardens and contracts, when exposed to the higher degrees of *Heat*; but very difficult of fusion, therefore the basis of the different kinds of *Pottery*.

Fusible, with effervescence, both with *Microcosmic Salt* and *Borax*.

Combines with most *Acids*, but with great difficulty, except under precipitation. The most important of these compounds, the *Sulphate of Alumine*; prepared from the decomposition of *Argillaceous Schistus*. Form of its crystals *octahedral*.

hedral. Taſte *aſtringent.* Soluble in about 14 times its weight of *Water.* Undergoes watery fuſion, and parts with its water of cryſtalliſation, on expoſure to *Heat* (*Alumen Uſtum* P. L.) When calcined with certain inflammable ſubſtances, as yolk of egg, or ſugar, produces a compound, which takes fire ſpontaneouſly on expoſure to *Air* (*Pyrophorus* of *Homberg*).

Order of Attraction of *Alumine* in the moiſt way, *Sulphuric Acid, Nitric, Muriatic, Oxalic, Arſenic, Fluoric, Sebacic, Tartareous, Succinic, Saccho-lactic, Citric, Phoſphoric, Formic, Lactic, Benzoic, Acetic, Boracic, Sulphureous, Nitrous, Carbonic,* and *Pruſſic*; in the dry way, *Phoſphoric, Boracic, Arſenic, Sulphuric, Nitric, Muriatic, Fluoric, Sebacic, Succinic, Formic, Lactic, Benzoic,* and *Acetic Acids, Potaſh, Sulphur, Oxyd of Lead.*

Uſes, comprehending thoſe of Sulphate of Alumine, *Dying, Tanning, Printing, Silvering, Painting, Pottery, Medicine,* &c.

Of Silex.

Found in union, 1ſt. with Alumine, Lime, and Iron, as in moſt of the *precious Stones, Hyalite* and *Prehnite*; 2d. with Alumine only,

Schorlite, and *Calcedony*; 3d. with Alumine and Iron, *Olivin*, *Elastic Quartz*, *Obsidian*, *Opal*, *Pitch-stone*, *Hornslate*, *Jasper*, and *Argentine Felspar*; 4th. with Alumine, Lime, Magnesia and Iron, *Schorl*, *Thumerstein* and *Silicious Spar*; 5th. with Alumine, Iron and Manganese, *Rubellite*; 6th. with Alumine and Lime, *Quartz*, *Flint*, *Hornstone*, and *Ædelite*, and with water *Zeolite*; 7th. with Oxyd of Nickel, Lime, Alumine, and Oxyd of Iron, *Chrysoprase*; 8th. with Lime, Magnesia, Iron and Coal, *Silicious Schistus*; 9th. with Alumine, Lime, Sulphate of Baryt, Magnesia, and Iron, *Adularia*, without Iron, *Felspar*; 10th. with Alumine, Sulphate of Lime, and Oxyds of Copper and Iron, *Labrador-Felspar*; 11th. with Alumine, Baryt and Water, *Staurolite*; and 12th. with Lime, Sulphate of Lime and Iron, *Lapis Lazuli*.

May be separated from most of these by digestion in *Nitric Acid*.

Colour *white*. *Insipid*. *Insoluble*. Specific gravity 2.66. *Infusible*.

Soluble in the *Fluoric*, but in no other acid.

Soluble also in the solution of either of the *fixed Alkalis*.

May

May be fused with *Lime*, *Microcosmic Salt*, or *Borax*; but much more readily with *Potash* or *Soda*: hence the preparation of the different kinds of glass.

When melted with a large proportion of *Alkali*, forms a deliquescent compound, *Liquor Silicum*, the decomposition of which by an *Acid*, furnishes a gelatinous precipitate thought to be soluble in about 1000 parts of *Water*.

Order of Attraction in the moist way, *Fluoric Acid*, *Potash*; in the dry way, *Potash*, *Boracic Acid*, *Phosphoric Acid*, *Oxyd of Lead*.

Used principally in *Polishing*, *Painting*, *Glass-making*.

Of Adamantine Earth.

Found combined with Silex, Iron and Nickel, in *Adamantine Spar*, of which it constitutes above $\frac{2}{3}$ of the whole.

Insoluble in *Acids*.

Infusible with *Alkalis*.

The other properties of this Earth not as yet fully ascertained.

Of Jargon Earth.

Combined with Silex, Iron, and Nickel, in the Stone called *Jargon* or *Circon.*

Colour, *white.* Specific gravity eſtimated at 4.000.

With *Sulphuric Acid* forms an aſtringent ſalt with ſtelliform cryſtals; with the *Acetous Acid,* a ſalt incapable of cryſtalliſation.

Inſoluble even in a boiling ſolution of *Potaſh.*

Melts with *Borax* without effervescence; but infuſible with either the *Fixed Alkalis,* or *Microcoſmic Salt.*

Order of Attraction as yet unknown.

Of Sidneyan Earth.

Found in a mineral, from *Sidney Cove,* conſiſting of white ſand, colourleſs Mica, a few black particles, and white Alumine, with which this Earth appears to be mixed, and from which it may be extracted by the *Muriatic Acid.*

Colour,

Colour, *white*. Fusible at 150 of *Wedgwood's Thermometer*.

Not soluble either by the *Sulphuric* or *Nitric Acid*.

Precipitable from its solution in the *Muriatic Acid*, by *Alkalis*, or by the affusion of *Water*. Its combination with this Acid may also be decomposed, by the addition of the *Sulphuric*.

Order of Attraction not further ascertained.

Of Metals.

Distinguished by their *Weight*, *Opacity*, and *Splendour*. Also remarkable for their power of conducting the *Electrical Fluid*.

Presented to us by nature under different forms, as, 1st. *Native*, i. e. when in possession of the properties just mentioned; 2d. *Oxydated*, or in union with *Oxygen*; 3d. *Saline*, or united with one or other of the *Acids*; 4th. *Mineralized*, or combined with *Sulphur*; and 5th. *Alloyed*, or in union with each other.

Different proceſſes therefore neceſſary for obtaining theſe bodies in a ſeparate ſtate; hence the *Pounding*, *Waſhing*, *Roaſting*, *Amalgamation*, and *Reduction* of Metallic ores.

May be conſidered inſoluble in *Water* at a common temperature, though capable of decompoſing it, under certain circumſtances.

Differently affected by expoſure to *Air*.

Fuſible and *Volatile* at very different temperatures. All *cryſtalliſe* in cooling. The oxyds of many *vitrifiable*.

Some *Malleable* and *Ductile*, others *Fragile*; hence the diſtinction into *Metals* and *Semi-Metals*.

Some capable, others incapable of *Oxydation* under the joint action of *Heat* and *Air*; hence again the diviſion into *perfect* and *imperfect*.

All metals combinable with one or other of the *Acids*, with which they produce for the moſt part cryſtalliſable ſaline compounds. May be in ſome inſtances converted, by the decompoſition of the acid, into the ſtate of *Oxyd*, in others completely *acidified*.

The

The *Metallic Oxyds*, generally ſpeaking, more readily ſoluble in *Acids*, than the *Metals* from which they are formed.

The ſame more remarkably the caſe with regard to *Alkalis*, which act on few of the metals unleſs they are previouſly *oxydated*.

The *Earths* do not appear to act on metallic ſubſtances, but unite, by fuſion, with their *Oxyds*.

Metals, when united with each other, often undergo remarkable changes of *Volatility*, *Fuſibility*, and *Specific Gravity*.

By fuſion, moſt of them may be united to *Sulphur*.

All except *Zinc*, ſoluble in *Alkaline Sulphurets*.

The Attraction of the Metals for *Acids* in moſt inſtances inferior to that of the *Alkalis*, and *Earths*.

The perfect Metals are, *Platina*, *Gold*, and *Silver*.

Of Platina.

Brought from *South America*, in ſmall grains of a dull ſilver-colour, mixed with ferruginous Sand, particles of Native Gold, and Quickſilver.

Both malleable and ductile when pure, though harder than either gold or ſilver.

Specific gravity upwards of 22.

Extremely difficult of fuſion, but when urged by an intenſe heat, becomes capable of being welded.

Diſſolves ſlowly in the *Oxy-muriatic Acid*, communicating to it firſt a yellow, and afterwards a deep reddiſh-brown colour. Inſoluble in the other acids, even with the aſſiſtance of heat.

Differs from all other metals in being precipitable from its ſolution by *Muriate of Ammoniac*; the precipitate, upon fuſion, yielding a malleable Regulus.

Said alſo to be ſoluble in *Sulphuret of Potaſh*.

Is ſcarcely affected in the dry way, either by *Compound Salts*, or by *Sulphur*.

Unites

Unites by fusion in different proportions with many other metals, but most easily and intimately with *Zinc*. With *Copper* produces a compound of a golden colour, hard, malleable, close grained, susceptible of a fine polish, and durable.

Order of Attraction in the moist way, *Æther*, *Muriatic*, *Oxy-muriatic*, *Nitric*, *Sulphuric*, *Arsenic*, *Fluoric*, *Tartareous*, *Phosphoric*, *Sebacic*, *Oxalic*, *Citric*, *Formic*, *Lactic*, *Acetic* and *Succinic Acids*; in the dry way, *Arsenic*, *Gold*, *Copper*, *Tin*, *Bismuth*, *Zinc*, *Antimony*, *Nickel*, *Cobalt*, *Manganese*, *Iron*, *Lead*, *Silver*, *Quicksilver*, and *Sulphuret of Potash*.

Use as yet, principally, confined to Chemical and Philosophical purposes.

Of Gold.

Found either alloyed with Silver, Copper, or Iron, *Native Gold*; or combined with Sulphur, Antimony, Arsenic, Lead, Iron and Silver, *Grey Gold Ore*; or with Bismuth and Sulphur, *White Gold Ore*, *Aurum Graphicum*.

When pure, of a bright yellow colour, soft,

very tough, ductile and malleable to an extraordinary degree; not ſonorous.

Next to *Platina* the heavieſt body in nature, its *Specific Gravity* being 19.30.

Melts, after ignition, at 32 of *Wedgw.* = 5237 of *Farenh.* and may be volatilized by a more intenſe degree of heat. Cryſtalliſes in cooling, into quadrangular pyramids. Converted by electrical exploſions, into a purple *Oxyd.*

Soluble only in *Oxy-muriatic Acid*, the compound Acid, *Aqua Regia*, and in the ſolutions of *Alkaline Sulphurets.*

The *Oxy-muriatic* ſolution of a yellow colour, ſtains the ſkin purple.

Separable from this ſolution in a metallic form, by *Æthers*, *Eſſential Oils*, and *Phoſphorus*, by *Zinc* and many other metals; may be alſo precipitated by all the *Alkalis* and *Earths.* The precipitate by *Tin*, of a purple colour (*Purple Powder of Caſſius*), and communicates a red colour to glaſs; that by *Ammoniac*, has the property of exploding with great violence when expoſed to a moderate heat, *Aurum fulminans.*

Combines with all the *Metals* in various proportions.

portions. With *Silver* becomes paler; with *Copper* of a deeper colour, more fusible, harder, and more elastic.

May be freed from admixture of imperfect metallic matter, by fusion with *Lead*, together with access of *Air*; hence the process of *Cupellation*.

Order of attraction, in the moist way, *Æther*, *Muriatic Acid*, *Oxy-muriatic*, *Nitric*, *Sulphuric*, *Arsenic*, *Fluoric*, *Tartareous*, *Phosphoric*, *Sebacic*, and *Prussic*, *Potash*, *Ammoniac*; in the dry way, *Quicksilver*, *Copper*, *Silver*, *Lead*, *Bismuth*, *Tin*, *Antimony*, *Iron*, *Platina*, *Zinc*, *Nickel*, *Arsenic*, *Cobalt*, *Manganese*, *Sulphuret of Potash*.

Used in the construction of *Utensils* and different kinds of *Ornaments*; in *Enamelling*, *Gilding*, *Dying*, *Soldering*, &c.

Of Silver.

Found, 1st. united to a small quantity of gold, *Native Silver*; or 2d. to Arsenic and Iron, *Arsenical Silver*; or 3d. to Muriatic and Sulphuric Acids, Iron, Alumine and Lime, *Horn Silver*; or 4th. to Sulphur only, *Vitreous Silver*; or 5th. to Sulphur, Antimony and Iron, with a

little

little Copper and Arſenic, *Brittle Vitreous Silver*; or 6th. to Arſenic and Sulphur; or to Antimony, Sulphur, and Sulphuric Acid, *Red Silver Ore*; or 7th. to Lead, Sulphur, Antimony, Iron, Alumine, and Silex, *White Silver Ore.*

Colour *white, ſplendid.* Leſs malleable and ductile than *Gold,* but harder and more opake.

Specific gravity 10.47.

Tarniſhes on expoſure to air.

Fuſible at 28 of *Wedgw.* = 4717 of *Farenh.* and by increaſe of heat may be volatilized, and partially *oxydated,* in which ſtate it communicates a yellow colour to *Glaſs.*

Moſt readily ſoluble in *Nitric Acid,* forming with it a corroſive cryſtalliſable ſalt, ſuſceptible of Watery Fuſion (*Argentrum Nitratum* P. L.) Soluble alſo in *Nitro-Sulphuric Acid, Aqua Regina* of *Keir.*

From the *Nitric Acid,* may be precipitated in the form of *Oxyd,* by *Alkalies* and *Earths,* or, unoxydated, by many of the *Metals,* and alſo by *Phoſphorus.* If thrown down by *Lime Water,* the *Oxyd* when dried, and afterwards waſhed with *Ammoniac,* explodes moſt violently on the ſlighteſt agitation, *Argentum fulminans.*

Combines

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y cow milk y thereupon water

Plot and se revolutionaries in Hungary
Force & Steam

Combines extenſively with the other *Metals*. With *Copper* becomes harder and more ſonorous.

Combines readily with *Sulphur*, and is blackened by *Hepatic Gas*.

Order of Attraction, in the moiſt way, *Muriatic Acid*, *Sebacic*, *Oxalic*, *Sulphuric*, *Saccho-lactic*, *Phoſphoric*, *Nitric*, *Arſenic*, *Fluoric*, *Tartareous*, *Citric*, *Formic*, *Lactic*, *Acetous*, *Succinic*, *Pruſſic*, and *Carbonic*, *Ammoniac*; in the dry way, *Lead*, *Copper*, *Quickſilver*, *Biſmuth*, *Tin*, *Gold*, *Antimony*, *Iron*, *Manganeſe*, *Zinc*, *Arſenic*, *Nickel*, *Platina*, *Sulphuret of Potaſh*, *Sulphur*.

Uſed in the conſtruction of various *Utenſils*; compoſition of *Bell-metal*; in *Silvering*, *Enamelling*, *Soldering*, *Dying*, *Medicine*, &c.

The imperfect metals are *Quickſilver*, *Lead*, *Copper*, *Iron*, and *Tin*.

Of Quickſilver.

Found 1ſt. *Native*; 2d. alloyed with ſilver, *Native Amalgam*; 3d. with Oxygen, *Native Oxyd*; 4th. with Muriatic and Sulphuric Acids, *Horn-mercury*;

mercury; 5th. with Sulphur, *Cinnabar*; and 6th. with Sulphuret of Potaſh or Soda, *Hepatic Ore.*

Form *liquid.* Colour, *ſilvery-white.*

Specific Gravity 13.56.

Not perceptibly altered by expoſure. By agitation, with acceſs of air, is converted into a black *Oxyd:* a change analogous to this ſeems to take place on trituration with tenacious ſubſtances; hence *Pilulæ Hydrargyri, Unguentum Hydrargyri,* &c. P. L.

Volatile at 600° and congeals at 39 below 0 of *Farenh.* When heated with acceſs of air, is converted into a red *Oxyd* (*Hydrargyrus Calcinatus* P. L.)

Combines with, and partly decompoſes, concentrated *Sulphuric Acid,* by the aſſiſtance of heat, producing a ſaline maſs, which by the affuſion of water becomes of a yellow colour (*Hydrargyrus Vitriolatus* P. L.)

Very readily ſoluble in the *Nitric Acid,* with the production of *Nitrous Gas*; the ſolution evaporated produces alſo a ſaline maſs, which upon further decompoſition of the acid by expoſure to heat,

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Nitrate of Pd by action of Sulphurous acid will show now a precipitate which is Sly soluble. Ammonia nitrate or if nitrate of Pd is recomposed by common salt produces same

heat, is reduced to the ſtate of *Oxyd* (*Hydrargyrus nitratus ruber* P. L.)

Not acted upon by the *Muriatic Acid* unleſs through the medium of *Oxygen*, by the aſſiſtance of which it unites with it more powerfully than with either of the former acids; hence the preparation of Muriate of Mercury, by ſublimation, from a mixture of Sulphate of Mercury, and Muriate of Soda (*Hydrargyrus Muriatus* P. L.); of mild Muriate of Mercury in the dry way, by the addition of Quickſilver to the former, and repeating the ſublimation (*Calomelas* P. L.); and in the moiſt way, by the decompoſition of Nitrate of Quickſilver by Muriate of Soda (*Hydrargyrus Muriatus mitis* P. L.)

When oxydated, is diſſolved by the *Acetic Acid*, or may be united with it by adding *Acetite of Potaſh* to a ſolution of *Nitrate of Quickſilver* (*Hydrargyrus Acetatus* P. L.)

May be precipitated from its ſolutions by *Alkalis*, by *Lime* and other Earths, and by ſeveral other metals; the colour of the precipitates differing according to the degree of oxydation. The precipitate from the ſolution of *Nitrate of Quickſilver* by *Ammoniac*, is of a grey colour (*Hydrargyrus*

drargyrus Precipitatus Cinereus P. Edin.); from the ſolution of *Muriate of Quickſilver* of a pure white (*Hydrargyrus Præcipitatus albus* P. L.) The precipitates by Alkalis, when mixed with *Sulphur*, poſſeſs the power of exploding if expoſed to a gradual heat.

Combines readily with moſt of the metals, forming what are called *Amalgams*.

Unites with *Sulphur*, by trituration, into a black powder (*Hydrargyrus cum Sulphure* P. L.) by fuſion and ſublimation, into a red ſtriated maſs (*Hydrargyrus Sulphuratus ruber* P. L.) which may alſo be prepared by the diſtillation of a mixture of *Muriate of Quickſilver* and *Sulphuret of Antimony (Cinnabar Antimonii)*.

Decompoſes the *Alkaline Sulphurets*, producing an *Æthiops* with *Sulphurets of Potaſh* and *of Soda*, and a factitious *Cinnabar*, with *Sulphuret of Ammoniac*.

Order of Attraction, in the moiſt way, *Sebacic Acid, Muriatic, Oxalic, Succinic, Arſenic, Phoſphoric, Sulphuric, Saccho-lactic, Tartareous, Citric, Nitric, Fluoric, Acetous, Boracic, Pruſſic, Carbonic*; in the dry way, *Gold, Silver, Platina, Lead, Tin, Zinc, Biſmuth, Copper, Antimony, Arſenic, Iron, Alkaline Sulphurets, Sulphur*.

Uſed

Uſed principally in the working of *Gold Ores*, conſtruction of *philoſophical Inſtruments, and of Mirrors*; *in Gilding, Painting, Anatomy*, and *Medicine*.

Of Lead.

Found 1ſt. *Native*, though very rarely; 2d. in union with Oxygen, Iron, and Alumine, *Red Lead Ore*; 3d. with Carbonic Acid, a little Lime and Alumine, *Spathoſe Lead Ore*; 4th. with Molybdic Acid, Iron and Silex, *Carinthian Molybdate of Lead*; 6th. with Sulphuric Acid, *Sulphate of Lead*; 7th. with Sulphur and a little Silver, *Galena*; and 8th. with Antimony and a little Silver, *Antimonial Lead Ore*.

Colour, *bluiſh-white*; *ſoft, flexible*, not *tenacious*.

Specific gravity 11.35.

Becomes dull on expoſure to *Air*.

Melts at about 540° of *Farenh.*—In a ſtrong heat boils, and if air be admitted, unites readily with different portions of *Oxygen*; hence the preparations of *Litharge* and *Minium*: by a

ſtill

ſtill greater degree of heat may be converted into *Glaſs*.

Unleſs aſſiſted by heat, is not readily acted on either by the *Sulphuric* or *Muriatic Acid*. Diſſolves in diluted *Nitrous Acid*, and forms with it a cryſtalliſable ſalt. On expoſure to the vapour of *Acetous Acid*, is converted into a white *Oxyd* (*Ceruſſa* P. L.), the ſolution of which, in a freſh portion of this acid, produces a cryſtalliſable compound remarkable for its ſweetneſs and aſtringency (*Ceruſſa Acetata* P. L. *Aqua Lithargyri Acetati* P. L.)

Exhibits a browniſh colour when precipitated from its ſolutions by *Alkaline Sulphurets*.

By fuſion with the *Fixed Alkalis*, becomes partially ſoluble in *Water*; and may be oxydated by deflagration with *Nitre*.

Unites eaſily by fuſion with moſt of the metals, more eſpecially with *Gold*, *Silver*, *Tin*, and *Biſmuth*.

Produces with *Sulphur*, a grey coloured brittle compound, leſs fuſible than itſelf; with *Phoſphorus*, a compound which is malleable, but more diſpoſed to tarniſh.

The

The *Oxyds* of this metal ſoluble in *Oils*, hence the preparation of certain *Plaiſters*, *Varniſhes*, and *Paints*; capable alſo of decompoſing ſeveral of the compounded ſalts, *Patent Yellow*.

Order of Attraction, in the moiſt way, *Sulphuric Acid*, *Sebacic*, *Saccho-lactic*, *Oxalic*, *Arſenic*, *Tartareous*, *Phoſphoric*, *Muriatic*, *Nitric*, *Fluoric*, *Citric*, *Formic*, *Lactic*, *Acetous*, *Boracic*, *Pruſſic* and *Carbonic*, *Potaſh*; in the dry way, *Gold*, *Silver*, *Copper*, *Quickſilver*, *Biſmuth*, *Tin*, *Antimony*, *Platina*, *Arſenic*, *Zinc*, *Nickel*, *Iron*, *Alkaline Sulphurets*, *Sulphur*.

Employed in medicine, and very extenſively in the arts, particularly in the conſtruction of *Buildings* and different *Utenſils*, in the making of *Shot*, in *Statuary*, *Glaſs-making*, *Glazing*, *Painting*, *Varniſhing*, Refinement of *Gold and Silver*, Compoſition of *Pewter* and *Soft-ſolder*, &c. &c.

Of Copper.

Found 1ſt. *Native*; 2d. united to Oxygen, *Tile ore*; 3d. to oxygen and oxyd of Iron, *Pitch-Copper ore*; 4th. to Carbonic Acid, *red*, *green* and *azure Copper ores*; 5th. to Arſenic Acid,

Arſeniate of Copper; 6th. to Sulphuric Acid, *Sulphate of Copper*; 7th. to Muriatic Acid, *Muriate of Copper*; 8th. to Sulphur, *Vitreous Copper ore*; 9th. to Sulphur and Iron, *Yellow Copper ore*; 10th. to Arſenic and Iron, *White Copper ore*, and, 11th. to Lead, Antimony, Iron, Sulphur, Silex and Silver, *Grey Copper ore*.

Colour, *reddiſh*. Taſte *nauſeous*, *Styptic*. Specific gravity 7.788.

Hard, *elaſtic*, *malleable*, and *ductile*. *Sonorous*.

Ruſts on expoſure to air.

If heated changes colour, and is converted into a browniſh red *oxyd*. Melts at 27° *Wedgw.* = 4587 *Farenh.*; and exhibits a bluiſh-green flame.

Soluble by the aſſiſtance of a boiling heat in concentrated *Sulphuric Acid*, forming with it a blue cryſtalliſable ſalt (*Cuprum Vitriolatum* P. L.)

Diſſolves very readily in the *Nitric Acid*, with a production of *Nitrous Gas*: the ſolution of a *deep blue* colour, and affords by evaporation a deliqueſcent ſalt, which detonates on being ſuddenly heated.

Is

Is difficultly acted upon by *Muriatic Acid.* Colour of the diluted ſolution *green.*

By the *Acetous Acid* is rather corroded than diſſolved. If moiſtened with this Acid is, under expoſure to air, converted into a green ſaline *Oxyd (Ærugo* P. L.)

Is more or leſs acted upon by all the Alkalis. To the ſolution of Ammoniac it communicates a beautiful blue colour, which diſappears on the excluſion, and returns on the admiſſion of air.

May be precipitated from its ſolution in Sulphuric Acid, by Arſeniate of Potaſh, *(Scheele's green Pigment):* from Nitric Acid by Lime, *(Verditer):* from any of its ſolutions by Iron, *(Zement Copper).*

Detonates with melted *Nitre,* and, by the aſſiſtance of heat, decompoſes *Muriate* of *Ammoniac.*

Unites with many of the metals, and forms very important compounds, particularly with *Platina, Gold, Silver, Tin, Arſenic,* and *Zinc.*

Unites alſo, by fuſion, with *Sulphur* and with *Phoſphorus.*

The oxyds of this metal give a greeniſh tinge to *Glaſs.*

Order of attraction, in the moist way, *Oxalic Acid, Tartareous, Muriatic, Sulphuric, Saccho-lactic, Nitric, Sebacic, Arsenic, Phosphoric, Succinic, Fluoric, Citric, Formic, Lactic, Acetous, Boracic, Prussic, Carbonic, Potash, Ammoniac, Unctuous Oils*; in the dry way, *Gold, Silver, Arsenic, Iron, Manganese, Zinc, Antimony, Platina, Tin, Lead, Nickel, Bismuth, Cobalt, Quicksilver, Alkaline Sulphurets, Sulphur.*

Application very extensive, employed chiefly in *Gunnery*, in the Construction of *different Utensils*, in the Composition of *Bell-metal* and *Alloys*, in *Enamelling, Dying, Painting* and *Medicine.*

Of Iron.

Found 1st. *Native*; 2d. united to a small proportion of Oxygen, *Grey Iron Ore*; 3d. to Carbonic Acid, and Alumine, *Hematite*; 4th. to Oxygen, Carbonic Acid, Alumine, and often Phosphoric Acid, *Argillaceous Iron Ores*; 5th. to Lime, Carbonic Acid and Manganese, *Spathose Iron Ore*; 6th. to Sulphuric Acid, *Native Sulphate of Iron*; 7th. to Sulphur, *Pyrites.*

As obtained from its ores, by the usual pro-

cess

ceſs of reduction, aſſumes the form of *Crude Iron*, which freed from its impurities, by continued expoſure to the combined action of *Heat* and *Air*, and ſubſequent hammering or rolling, is converted into *Bar Iron*.

Colour of this *bluiſh white*. Specific gravity 7.788. *Hard, elaſtic, ductile, tenacious, magnetical.*

Ruſts eaſily on expoſure to *Air*, or application of *Moiſture* (*Rubigo Ferri* P. L.)

Is alſo, under acceſs of air, eaſily affected by *Heat*, undergoing various changes of colour from ſuperficial oxydation, long before it is ignited; but is extremely difficult of fuſion.

The only metal capable of combuſtion by *Colliſion*.

When heated ſo as to become ſoft, different portions may be united into one maſs by the operation of *Welding*.

If expoſed to *Oxygen Gas*, when ignited, burns with great brilliancy and rapidity, and is afterwards found to be *oxydated*.

The vapour of water applied to heated iron,

alſo *oxydates* it, and furniſhes *Hydrogen Gas*. (Vide page 10.)

When heated in cloſe veſſels, for a certain length of time, in contact with *Charcoal*, acquires *Weight*, becomes *fuſible*, more *brittle* and *elaſtic*, and capable of contracting a great degree of *Hardneſs*, when ignited and ſuddenly cooled, *(Steel)*.

May afterwards be deprived of theſe properties by cementation with earthy infuſible powders, or the ſimple application of *Heat*.

Diſſolves more or leſs perfectly in all the *Acids*. With moſt of them, in the act of ſolution, produces *Hydrogen Gas*.

Requires the aſſiſtance of heat to decompoſe concentrated *Sulphuric Acid*, but diſſolves readily in it when diluted, and forms a pale green cryſtalliſable ſalt *(Ferrum Vitriolatum* P. L.) A ſimilar compound is obtained by the ſpontaneous decompoſition of Iron Pyrites, *(Copperas)*.

With *Nitric Acid* produces either a reddiſh brown or greeniſh ſolution, which changes to a bright red on the addition of *Carbonate of Potaſh*, or *Ammoniac*.

With

With the *Muriatic Acid*, a yellowiſh brown ſolution, miſcible with ſpirit of wine, (*Tinctura Ferri Muriati* P. L.)

Soluble by digeſtion in the *Acetous Acid*; hence the chalybeate properties communicated by it to different kinds of wine (*Vinum Ferri* P. L.)

Alſo eaſily acted on by Acid of Tartar (*Ferrum Tartariſatum* P. L.)

By uniting with *Pruſſic Acid*, forms *Pruſſian Blue*.

In combination with *Carbonic Acid* becomes ſoluble in water; hence the properties of *Chalybeate Springs*.

With *Gallic Acid* produces a black precipitate, the baſis of common *Ink*.

Precipitates ſpontaneouſly from moſt of its acid ſolutions on expoſure to *Air*. When thrown down from theſe by an *Alkali*, may be re-diſſolved by the addition of a further portion of it.

Combines with the *Fixed Alkalis* by fuſion.

Deflagrates with *Nitrate of Potaſh*; and ſublimes with *Muriate of Ammoniac*, which it partially decompoſes (*Ferrum Ammoniacale* P. L.)

When in the ſtate of *Oxyd*, promotes the fuſion of ſeveral of the *Earths*, and communicates different tinges to *Glaſs*, according to the degree of *Oxydation*.

Unites by fuſion with all the other metals, except *Quickſilver*, *Lead* and *Biſmuth*. In combination with Arſenic, becomes brittle when heated, *(Red-ſhort Iron)*.

Has of all metals the ſtrongeſt attraction for *Sulphur*, with which, when heated, it unites very readily.

Is alſo capable of entering into combination with phoſphorus, *(Cold-ſhort Iron)*.

Bar-Iron, *Steel*, and *Crude Iron*, conſidered as differing from each other principally in containing different portions of *Carbon*.

Order of Attraction, in the moiſt way, *Oxalic Acid*, *Tartareous*, *Sulphuric*, *Saccho-lactic*, *Muriatic*, *Nitric*, *Sebacic*, *Phoſphoric*, *Arſenic*, *Fluoric*, *Succinic*, *Citric*, *Formic*, *Lactic*, *Acetous*, *Boracic*, *Pruſſic*, and *Carbonic*; in the dry way, *Nickel*, *Cobalt*, *Manganeſe*, *Arſenic*, *Copper*, *Gold*, *Silver*, *Tin*, *Antimony*, *Platina*, *Biſmuth*, *Lead*, *Quickſilver*, *Alkaline Sulphurets*, *Sulphur*.

Uſes too extenſive to be enumerated.

Of

Of Tin.

Found either united with oxygen and iron, *Spathose Tin-ore*; or with Sulphur, Copper and Iron, *Tin Pyrites.*

Colour, *white.* Specific gravity 7.291.

Soft. Malleable. Of little *tenacity.* Slightly *sonorous. Inelastic.* Makes a crackling noise on being bent.

Tarnishes on exposure to *Air.*

Melts at 410 of *Farenh.* and by the continuance of the heat, with access of air, is easily converted into a white *Oxyd,* very difficult of fusion, the basis of common enamel.

In its transition from the fluid to the solid state, may, by agitation, be readily reduced to powder, (*Pulvis Stanni* P. L.)

Decomposes the *Sulphuric Acid* by the assistance of heat. Is by the *Nitric Acid* immediately, without heat, converted into a white *Oxyd.*

Dissolves readily in the *Muriatic Acid,* with effervescence,

effervescence, and forms with it a crystallisable compound.

Dissolves also with still greater rapidity in the *Oxy-muriatic Acid* and *Aqua Regia*. These solutions remarkable for the property of giving a bright scarlet colour to the infusion of *Cochineal* and some other analogous substances. When united with *Oxy-muriatic Acid*, in the dry way, produces a colourless liquor strongly disposed to assume the gaseous form under the common pressure of the Atmosphere, *Smoaking Liquor of Libavius*.

May be corroded by the continued application of the *Acetous Acid* in the form of vapour.

Capable of being acidified by a process similar to that used for the preparation of *Arsenic Acid*.

Is little affected, in the dry way, either by *Alkalis* or *Earths*, but decomposes the compounds of the former with the *Sulphuric Acid*. Detonates rapidly with *Nitre*; and decomposes *Muriate of Ammoniac*.

In the moist way, may be made to decompose *Nitrate of Copper* with an impetuosity productive of actual combustion.

May

May be united with all the other *Metals*, and in all proportions, occaſioning in many of them an alteration in their malleability, fuſibility, ſpecific gravity, and hardneſs.

When melted with *Sulphur*, produces a dark ſtriated compound, which if prepared by ſublimation, is of a golden colour and ſpongy texture, *Aurum Muſivum.*

May alſo be combined with *Phoſphorus.*

Order of Attraction, in the moiſt way, *Sebacic Acid, Tartareous, Muriatic, Sulphuric, Oxalic, Arſenic, Phoſphoric, Nitric, Succinic, Fluoric, Saccholactic, Citric, Formic, Lactic, Acetous, Boracic, Pruſſic, Potaſh, Ammoniac*; in the dry way, *Zinc, Mercury, Copper, Antimony, Gold, Silver, Lead, Iron, Manganeſe, Nickel, Arſenic, Platina, Biſmuth, Cobalt, Alkaline Sulphurets, Sulphur.*

Employed in the compoſition of *Solder, Pewter, Bell-metal, Printer's Types*, &c. in the conſtruction of *Mirrors*, in *Tinning, Enamelling, Medicine*, &c.

The Semi-metals are, *Biſmuth, Nickel, Arſenic, Cobalt, Zinc, Antimony, Manganeſe, Tungſten, Uranite, Molybdena*, and *Manachanite.*

Of Bismuth.

Found 1st. *Native*, 2d. in union with Oxygen, *Native Oxyd*, 3d. with Sulphur, *Sulphuret of Bismuth.*

Colour, *yellowish white.* — Specific gravity 9.822.

But little subject to tarnish. Melts at 460 *Farenh.*

In close vessels sublimes without alteration, and in cooling crystallizes into cubes.

If kept in fusion with access of *Air* is converted into a greenish grey *Oxyd.*—Heated to redness burns, with a small blue flame, and emits yellowish smoke, condensible into an *Oxyd* of a similar colour, *(Flowers of Bismuth)*, which by increase of heat melts into a greenish *Glass.*

Dissolves most readily in the *Nitric Acid*, and furnishes a salt, which detonates readily when exposed to sudden *Heat*; and which may be decomposed by the affusion of *Water*, yielding a white *Oxyd*, *(Magistery of Bismuth)*. It may also be

be decomposed by the *Alkalis* and *Alkaline Sulphurets*.

The precipitate by *Sulphuret of Ammoniac* of a similar appearance to that which it produces in solutions of *Lead*.

Deflagrates with *Nitre*, without detonation, and is converted into an *Oxyd*, which facilitates the fusion of the *Earthy Bodies*, and also of the other *metallic oxyds*; may therefore be used in place of *Lead* in the refinement of *Gold* and *Silver*.

Combines with most of the other *metallic Substances*, rendering them for the most part more fusible.

Unites easily with *Sulphur* into a bluish-grey striated compound.

Order of Attraction in the moist way, *Oxalic Acid*, *Arsenic*, *Tartareous*, *Phosphoric*, *Sulphuric*, *Sebacic*, *Muriatic*, *Nitric*, *Fluoric*, *Saccho-lactic*, *Succinic*, *Citric*, *Formic*, *Lactic*, *Acetous*, *Prussic*, *Carbonic*; *Ammoniac*; in the dry way, *Lead*, *Silver*, *Gold*, *Quicksilver*, *Antimony*, *Tin*, *Copper*, *Platina*, *Nickel*, *Iron*, *Zinc*, *Alkaline Sulphurets*, *Sulphur*.

Used

Used in the composition of *Pewter*, *Solder*, and *Printer's Types*, in *Assaying*, *Painting*, *Imitation of Silvering*, &c.

Of Nickel.

Found 1st. alloyed by Iron, *Native Nickel*; 2d. in combination with oxygen, *Native Oxyd*; 3d. with Iron, Arsenic, Cobalt and Sulphur, *Kupfer-Nickel.*

Difficult to obtain it pure.—Colour *reddish white.*—Specific gravity 7.88. *Hard*, somewhat *malleable*, *magnetical.* Very difficult of *fusion.*

Yields a green *Oxyd*, which communicates an hyacinthine tinge to *Glass.*

All its solutions of a green colour; that in the *Nitric Acid*, (in which it dissolves most readily) affords rhombic crystals, and like the others changes to a blue on the addition of *Ammoniac.*

Detonates, like most other metals, with *Nitre.*

Unites by fusion both with *Arsenic* and *Cobalt.* Unites also by fusion with *Sulphur.*

Order of attraction, in the moist way, *Oxalic Acid*,

Acid, Muriatic, Sulphuric, Tartareous, Nitric, Sebacic, Phosphoric, Fluoric, Saccho-lactic, Succinic, Citric, Formic, Lactic, Acetous, Arsenic, Boracic, Prussic, Carbonic, Ammoniac; in the dry way, *Iron, Cobalt, Arsenic, Copper, Gold, Tin, Antimony, Platina, Bismuth, Lead, Silver, Zinc, Alkaline Sulphurets, Sulphur.*

This metallic substance not as yet applied to any use.

Of Arsenic.

Found 1st. alloyed by Iron, *Native Arsenic*; 2d. combined with Oxygen, *Native Oxyd*; 3d. with different proportions of Sulphur, *Realgar, Orpiment*; and 4th. with Sulphur, Iron and sometimes Silver, *Mispickel.*

Colour, *steel-grey.* Texture, *scaly.* Specific gravity 5.76. Much disposed to tarnish.

Volatile in close vessels at 356 of *Farenh.*

If exposed to *Air* under the heat of ignition, burns with a blue flame, and is converted into a white *Oxyd (Common white Arsenic.)*

This

This ſoluble in about 15 times its weight of boiling water.—Taſte, *cauſtic*.—Leſs volatile than the *Regulus*.—Emits a garlic ſmell on the application of *Heat*.—*Vitreſcible*.—Promotes the fuſion of *Earthy Bodies*. When melted with *Sulphur*, produces different ſhades of colour, according to the degree of *Heat*; hence artificial *Orpiment* and *Realgar*.—By treatment with the *Nitric Acid*, becomes more completely *oxygenated*, (vide page 23).—Decompoſes *Nitre* in the dry way, producing a neutral cryſtalliſable ſalt, *Arſenical Salt of Macquer*.—If diſtilled with unctuous matter, reaſſumes the form of *Regulus*.

In its *metallic* ſtate, decompoſes moſt of the mineral acids; the *nitric* moſt readily.

Unites with moſt of the other *Metals*; rendering brittle thoſe which are ductile, and in a remarkable manner increaſing the fuſibility of ſome, and diminiſhing that of others.

To the red and yellowiſh metals communicates a ſilvery whiteneſs.

Soluble in *Alkaline Sulphurets*. Soluble alſo in *Unctuous Oils*, with which it forms a conſiſtent mixture.

Moſt

Moſt of the preparations of this metal in a high degree *noxious*, when ignorantly adminiſtered; the detection of their preſence therefore often of great moment.

Order of attraction, in the moiſt way, *Muriatic Acid*, *Oxalic*, *Sulphuric*, *Nitric*, *Sebacic*, *Tartareous*, *Phoſphoric*, *Fluoric*, *Saccho-lactic*, *Succinic*, *Citric*, *Formic*, *Lactic*, *Arſenic*, *Acetous* and *Pruſſic*, *Ammoniac*, *Unctuous Oils*, *Water*; in the dry way, *Nickel*, *Cobalt*, *Copper*, *Iron*, *Silver*, *Tin*, *Lead*, *Gold*, *Platina*, *Zinc*, *Antimony*, *Alkaline Sulphurets*, *Sulphur*.

Uſed principally in *Glaſs-making*, *Painting*, and *Medicine*.

Of Cobalt.

Found 1ſt. alloyed with Arſenic, *Grey Cobalt Ore*; 2d. united to Oxygen, *Native Oxyd*; 3d. to Arſenic Acid, *Cobalt Bloom*; 4th to Sulphur, *Sulphuret of Cobalt*; and 5th. to Arſenic, Iron, and Sulphur, *White Cobalt Ore*.

Colour, *light grey*. Specific gravity 7,811. *Compact*, *brittle*.

Fuſes with difficulty. When heated in contact with air, yields a brownish Oxyd, *Zaffre*, which fused with Silex produces a blue glaſs, *Smalt*.

Diſſolves with more or leſs facility in ſeveral acids; moſt eaſily in the *Nitric Acid*.

With the Muriatic and Oxy-muriatic Acids forms compounds, the reddiſh ſolutions of which, as often as expoſed to heat, change to a beautiful green, *Sympathetic Ink*.

Detonates feebly with *Nitre*.

Unites by fuſion with moſt of the other *Metals*.

Combines difficultly with *Sulphur*; more readily with *Alkaline Sulphurets*.

Its *Oxyd* ſoluble in *Ammoniac*.

Order of Attraction, in the moiſt way, *Oxalic Acid*, *Muriatic*, *Sulphuric*, *Tartareous*, *Nitric*, *Sebacic*, *Phoſphoric*, *Fluoric*, *Saccho-lactic*, *Succinic*, *Citric*, *Formic*, *Lactic*, *Acetous*, *Arſenic*, *Boracic*, *Pruſſic*, *Carbonic*, *Ammoniac*; in the dry way, *Iron*, *Nickel*, *Arſenic*, *Copper*, *Gold*, *Platina*, *Tin*, *Antimony*, *Zinc*, *Alkaline Sulphurets*, *Sulphur*.

Uſed

Uſed to colour *Glaſs*, in *Glazing*, *Enamelling*, *Painting*, *Waſhing*, &c.

Of Zinc.

Found 1ſt. in combination with Oxygen, Oxyd of Iron, Silex, and Alumine, *Calamine*; 2d. with Carbonic Acid, Water, Silex and Iron, *Carbonate of Zinc*; and 3d. with Sulphuric Acid and Water, *Sulphate of Zinc*.

Requires for its reduction to be treated in cloſe veſſels.

Colour, *bluiſh-white*. Specific gravity 7,190.

Somewhat *malleable*. Texture *laminated*.

When heated is eaſily pulveriſed; and like iron is capable of decompoſing *Water*. Melts at about 700 of *Farenh*.

In contact with air, burns ſoon after ignition, with a brilliant flame, and furniſhes a white flocculent *Oxyd* (*Flores Zinci* P. L.), convertible by an increaſe of heat into a yellowiſh *Glaſs*.

Is readily acted on by Acids. During its ſolution in the *Sulphuric* and *Muriatic Acids*, *Hydrogen*

drogen Gas is evolved. Produces with the former Acid, a ſtyptic cryſtalliſable ſalt.

May be precipitated from its ſolutions by *Earths* and *Alkalis*.

Decompoſes, in the dry way, *Sulphate of Potaſh* and many other compounded ſalts. Detonates violently with *Nitre*. By ſimple trituration decompoſes *Muriate of Ammoniac*. Is alſo capable of precipitating *Alum*, in the moiſt way.

Unites with all the other metallic ſubſtances except *Biſmuth*; giving to *Copper* additional elaſticity, durability, and hardneſs.

In its *metallic form* cannot be combined with *Sulphur*; but when *oxydated* unites readily with it.

Order of Attraction, in the moiſt way, *Oxalic Acid*, *Sulphuric*, *Muriatic*, *Saccho-lactic*, *Nitric*, *Sebacic*, *Tartareous*, *Phoſphoric*, *Citric*, *Succinic*, *Fluoric*, *Arſenic*, *Formic*, *Lactic*, *Acetous*, *Boracic*, *Pruſſic* and *Carbonic*, *Ammoniac*; in the dry way, *Copper*, *Antimony*, *Tin*, *Quickſilver*, *Silver*, *Gold*, *Cobalt*, *Arſenic*, *Platina*, *Biſmuth*, *Lead*, *Nickel*, *Iron*.

Of

Of Antimony.

Found 1ſt. *Native*; 2d. alloyed with Arſenic, *Native Arſenical Antimony*; 3d. in union with Oxygen, *Native Oxyd*; 4th. with Muriatic Acid, *Muriate of Antimony*; 5th. with Arſenic Acid and Sulphur, *Red Antimonial Ore*; 6th. with Sulphur only, *Grey Antimonial Ore*; and 7th. with Iron, Arſenic, Sulphur, and ſometimes Silver, *Plumoſe Antimonial Ore.*

Colour *ſilvery white.* Specific gravity 6.702. Texture *laminated. Very brittle.*

Melts ſoon after ignition. Is volatile in cloſe veſſels. When heated in contact with *Air*, is converted into a light white *Oxyd, Argentine Flowers of Antimony*, which are ſoluble in *Water*, and fuſible into an Hyacinthine *Glaſs.*

Decompoſes both the *Sulphuric* and *Nitric Acids*, the former with, the latter without, the aſſiſtance of *Heat.* Requires digeſtion for its ſolution in the *Muriatic Acid*; but in the *Oxymuriatic* diſſolves with great facility.

Decompoſes, in the dry way, moſt of the ſa-

line compounds of the *Sulphuric Acid.* Detonates readily with *Nitre*; and decompoſes *Muriate of Quickſilver.*

Combines with moſt other *Metals.*

Unites with *Sulphur* in all proportions, and forms with it a grey ſtriated compound, *Antimony* of the ſhops.

This when expoſed for a continuance to low heat, yields a grey *Oxyd*, which by fuſion is converted into a yellowiſh *Glaſs* (*Vitrum Antimonii* P. E.)

If roaſted with *Hartſhorn*, and afterwards ignited, yields a white *Oxyd*, (*Pulvis Antimonialis* P. L. *Antimonium Calcareo-Phoſphoratum* P. E).

When deflagrated with *Nitre*, is more or leſs decompoſed according to the degree of combuſtion, (*Antimonium Calcinatum* P. L. *Antimonium uſtum cum Nitro* P. E. *Crocus Antimonii* P. L. and P. E.)

Reduced to powder and boiled in a ſolution of *Potaſh*, depoſits, on cooling, an orange coloured precipitate (*Kermes Mineralis Ph. Suec.*); on the addition of the Sulphuric Acid to the ſolution whilſt hot, a browniſh red precipitate, (*Sulphur Antimonii præcipitatum* P. L. and P. E.)

A mixture

A mixture of *Crocus* of *Antimony* and *common Salt*, with the addition of *Sulphuric Acid*, produces, by diſtillation, a butyraceous compound (*Antimonium Muriatum* P. L. and P. E.), which on the affuſion of common water, or by the addition of Potaſh, furniſhes a white oxyd; *Powder of Algaroth.* The combination of this with acidulous Tartrite of Potaſh, forms a triple ſalt, (*Antimonium Tartariſatum* P. E.) Other Antimonial *Oxyds* give a ſimilar preparation, (*Antimonium Tartariſatum* P. L.)

Order of Attraction, in the moiſt way, *Sebacic Acid, Muriatic, Oxalic, Sulphuric, Nitric, Tartareous, Saccho-lactic, Phoſphoric, Citric, Succinic, Fluoric, Arſenic, Formic, Lactic, Acetous, Boracic, Pruſſic* and *Carbonic*; in the dry way, *Iron, Copper, Tin, Lead, Nickel, Silver, Biſmuth, Zinc, Gold, Platina, Quickſilver, Arſenic, Cobalt, Alkaline Sulphurets, Sulphur.*

Uſed in the compoſition of *Types*, in *Medicine*, &c.

Of Manganese.

Found, 1ſt. *Native*; 2d. in union with Oxygen, *Native Oxyd*; and 3d. with Oxygen, Silex, Iron, and Alumine, *Siliceous Manganese.*

Colour, *dull white.* Texture *granular.* Specific gravity 6.850. *Hard. Brittle.*

Extremely difficult to fuſe; but very eaſily *oxydated.*

Soluble in the diluted *Sulphuric*, in the *Nitric*, *Muriatic*, and ſeveral other acids.

In the ſtate of *Oxyd*, occaſions in the *Muriatic Acid* a ſtriking change of properties, by imparting to it a portion of its *Oxygen.* Vide page 18.

Its action on the *Alkalis* not yet aſcertained.

When oxydated, decompoſes both *Nitrate of Potaſh* and *Muriate of Ammoniac*, in the dry way.

In this ſtate, unites by fuſion with the *Earthy Bodies*, and when added to *Glaſs*, either renders it colourleſs or communicates a violet tinge, according to the degree of *Oxydation.*

Unites alſo, by fuſion, with *Sulphur*, into a yellowiſh

lowiſh-green maſs. By mixture with unctuous ſubſtances ſometimes occaſions *Inflammation.*

Combines in the metallic ſtate with moſt of the other *Metals*, rendering *Gold* and *Iron* more fuſible, *Copper* leſs.

Order of Attraction, in the moiſt way, *Oxalic Acid*, *Citric*, *Phoſphoric*, *Tartareous*, *Fluoric*, *Muriatic*, *Sulphuric*, *Nitric*, *Saccho-lactic*, *Succinic*, *Sebacic*, *Arſenic*, *Formic*, *Lactic*, *Acetous*, *Pruſſic* and *Carbonic*; in the dry way, *Copper*, *Iron*, *Gold*, *Silver*, *Tin*, *Alkaline Sulphurets.*

Employed principally in *Glaſs-making* and *Bleaching.*

Of Tungſten.

Found in an acid form in combination with Lime, *Tungſtate of Lime*; and 2d. with Oxyd of Manganeſe and of Iron, Silex, and Tin, *Wolfram.*

Colour *ſteel grey.* Texture *granular.* Specific gravity 17.6.

Nearly *infuſible.*

Yields

Yields a yellow *Oxyd.*

Insoluble in the *Sulphuric, Nitric, Muriatic,* and *Oxy-muriatic Acids.*

Combines with the other *Metals.* Does not lessen the ductility of *Silver* or *Copper*; but renders *Iron, Tin, Bismuth, Antimony,* and *Manganese* harder.

Order of Attraction, in the moist way, *Lime, Potash, Ammoniac*; in the dry way, *Potash, Lime, Iron, Manganese.*

Not as yet applied to any use.

Of Uranite.

Found 1st. united to Carbonic Acid and a little Copper, *Calcolite*; and 2d. to Sulphur, *Pich Blende.*

Has not as yet been perfectly *metallised.*

Of Molybdena.

Found in an acid form in combination with *Sulphur.*

Colour

Colour *grey*. Specific gravity not aſcertained. *Brittle*.

Leſs fuſible than either *Platina* or *Manganeſe*.

Yields a white *oxyd* when heated in contact with *Air*, or digeſted in *Nitric Acid*, or deflagrated with *Nitre*.

When combined with *Iron*, *Copper*, and *Silver*, renders them friable.

In union with *Sulphur* regenerates *Sulphuret of Molybdena*.

Order of Attraction unknown.

Not yet applied to any uſe.

Of Manachanite.

Found either amorphous, or in grains of a *grey* colour, *ponderous* and attractable by the *Magnet*.

Suppoſed to contain a *Metal* of a particular kind.

Of Inflammable Substances.

Theſe, ſuch as are more eſpecially remarkable for exhibiting the phenomenon of *Combuſtion*, when heated to a certain degree in contact with *Air*.

The changes produced on the *Air* in this proceſs, and the alteration which the *inflammable Subſtances* themſelves undergo, already particularly treated of. Vide page 7.

In their *Form*, *Conſiſtence*, *Weight*, *Volatility*, &c. the ſubſtances of this claſs differ widely from each other. They are comparatively *lighter* than moſt other bodies.

The principal mineral inflammable ſubſtances are, *Hydrogen Gas*, (vide page 11.) *Bituminous Bodies*, *Amber*, *Sulphur*, *Plumbago*, and the *Diamond*.

Of Bituminous Bodies.

Found either liquid and devoid of colour, *Naphtha*; or more or leſs liquid and of a dark colour, *Petroleum*, *Barbadoes Tar*; or ſolid, black, and

and of a compact or flaty texture, *Asphaltum*, *Jet*, *Coal*.

The principle of *Inflammability* apparently the same in all, the more liquid being, by continued exposure to *Air*, convertible into the more consistent, and all yielding similar products in distillation. In the different kinds of *Coal* there exists more or less *earthy* admixture, and often *Iron Pyrites*.

The *bituminous* bodies immiscible with *Water* and insoluble in *Spirit of Wine*.

They appear from a variety of circumstances to be of *vegetable* origin.

Of Amber.

Found for the most part in irregular masses more or less transparent, and of a brownish or yellowish colour.—Specific gravity from 1.055 to 1.000. Emits a peculiar odour on friction and becomes *electric*. Melts at 550 *Farenheit*. Burns with a whitish flame. In distillation yields *Water*, *Empyreumatic Oil*, (*Oleum Succini* P. L.) and a concrete *Acid*, (*Sal Succini* P. L.) Vide page 22.

Insoluble

Insoluble in *Water* and nearly so in *Spirit of Wine*, also in all the acids, the *Sulphuric Acid* excepted, in the solutions of the *Alkalis*, and in *essential* and *expressed Oils*; but the *Balsams* dissolve it readily.

Of the methods usually employed for rendering *Amber* transparent.

This substance also, probably of *vegetable* origin.

Of Sulphur.

Found either uncombined, or deposited by water, or sublimed by subterranean fire, *Native Sulphur*; or in combination with other bodies, more especially with different *Metals*.

May be obtained artificially by the decomposition of *Sulphuric Acid*.

Colour, *pale Yellow*.—Specific gravity 2.033. *Hard, brittle, insipid, insoluble*. Very easily melted. Sublimes in close vessels into light yellow flowers, (*Flores Sulphuris* P. L.)

Burns with a blue flame, and by absorbing *Oxygen* from the Air, is converted into *Sulphure-*

ous

ous Acid Gas, *Sulphureous* or *Sulphuric Acid*, according to the proportion of this principle.—Similar effects are produced on it by deflagration with *Nitre*.

Is little affected by *Acids*.

Unites readily with the *Alkalis*, and alſo with the *ſaline Earths*, producing liver-coloured compounds (*Sulphuret of Potaſh*, *&c.*) which are ſoluble in *Water*, and may be decompoſed by all the *Acids* (*Sulphur præcipitatum* P. L.).

When intimately mixed with certain proportions of *Potaſh* and *Nitre*, produces a compound which when gradually expoſed to heat explodes with great violence (*Pulvis fulminans*).

With *Nitre* and *Charcoal*, in mixture, it conſtitutes *common Gunpowder*.

Combines by fuſion with all the metals except *Platina*, *Gold*, and *Zinc*.

Is inſoluble in *Spirit of Wine*, but unites with *oily* matter of every kind, and with all the liquid *bituminous* bodies, into compounds of increaſed conſiſtence (*Balſams of Sulphur*).

Order of Attraction; in the moiſt way, *Lead*,

Tin, Silver, Quickſilver, Arſenic, Antimony, Iron, Potaſh, Ammoniac, Baryt, Lime, Magneſia, unctuous Oils, eſſential Oils, Æther, Spirit; in the dry way, *Potaſh, Soda, Iron, Copper, Tin, Lead, Silver, Cobalt, Nickel, Biſmuth, Antimony, Quickſilver, Arſenic.*

Employed principally in *Bleaching*, in the manufacture of *Sulphuric Acid*, and of *Gunpowder*, frequently alſo in *Medicine*.

Of Plumbago.

Found in different parts of the world, of different degrees of purity.

Colour, *blackiſh-blue.*—Feel, *unctuous.* Texture, *granular* or *compact.*—Specific gravity 2.00.

Inſoluble in *Water*, and unalterable on expoſure to *Air*.

When ignited in contact with this fluid, undergoes *ſlow Combuſtion*, leaving behind only a ſmall portion of *Oxyd* of *Iron*.

In cloſe veſſels it ſuffers no change.

It decompoſes *Sulphuric Acid* by the aſſiſtance of

of heat, but is insoluble either in the *Nitric* or *Muriatic Acid*, yet dissolves in the *Oxy-muriatic Acid*, and on deflagration with *Nitre*, produces *Corbonate* of *Potash*.

From these and other circumstances, considered as analogous to *Charcoal*.

Used in the manufacture of *Pencils*, *Razor-strops*, *Crucibles* and other chemical vessels, in polishing *Shot*, defending the surface of *Iron* from rust, lessening the friction in mill-work, &c.

Of the Diamond.

Found principally in certain parts of India, in crystals of different colours and sizes.

Figure of its crystals *octohedral*. Specific gravity, 3.521. Hardness greater than that of any other body.

Ascertained, by various experiments, to be capable of *Combustion*, but only in the most intense heats.

The *Sulphuric Acid* the only menstruum that has any effect on this gem.

Valued chiefly on account of its *Splendour* and *Durability*.

The principal vegetable inflammable ſubſtances are, *Alcohol*, *Eſſential Oils*, *Balſams*, *Reſins*, *Expreſſed Oils*, *Camphor*, *Charcoal*.

Of Spirit of Wine (Alcohol).

Obtained from ſuch ſubſtances as have undergone the *Vinous Fermentation*, of which thoſe containing *ſaccharine Matter* are alone ſuſceptible. This proceſs materially influenced by *Reſt*, *Dilution*, *Temperature*, and *Expoſure to Air*.

Repeated diſtillation and digeſtion on *Potaſh*, neceſſary to bring this fluid to its ultimate degree of purity.

When pure *colourleſs* and *tranſparent*.

Taſte *hot* and *pungent*. Specific gravity 0.817.

Miſcible with *Water* in all proportions.

Burns with a bluiſh flame, producing in combuſtion *Carbonic Acid Gas* and *Water*.

Undergoes

Undergoes ſingular changes in its properties by treatment with the different *Acids*; hence the preparation of *Æthers*, *Oleum Vini*, &c.

Diſſolves the *Alkalis*, and many of the *compounded neutral Salts*, particularly ſuch as are deliqueſcent. Alſo diſſolves *Soap*, and acts readily as a ſolvent on *Eſſential-Oils* and *Reſins*, on *Balſams* and on *Camphor*; hence the preparation of various *Spirituous Liquors*, *Tinctures*, *Varniſhes*, &c.

Conſidered by *Mr. Lavoiſier* and others, as a compound of *Hydrogen*, *Carbon*, and *Oxygen*, produced by the decompoſition of the ſugar, in the act of *Fermentation*.

Order of Attraction, *Water*, *Æther*, *Eſſential Oils*, *Ammoniac*, *Potaſh*, *Alkaline Sulphurets*, *Sulphur*.

In general uſe for various *technical* as well as *dietetical* and *medical* purpoſes.

Of Eſſential Oils.

Obtained from moſt fragrant vegetables, by expreſſion, or diſtillation with *Water*.

Taſte *pungent*. Odour, colour, and conſiſtence, *various*. Moſt of them lighter, ſome few heavier than *Water*.

Thicken and become inodorous when expoſed to *Air*.

Sparingly ſoluble in *Water*; but readily ſo in *Spirit*.

Volatile in cloſe veſſels, without decompoſition, but highly *inflammable* when heated in contact with *Air*.

Decompoſe the ſtronger *Acids*; in ſome inſtances with ſuch rapidity as to occaſion actual *Combuſtion*.

May be united with the *Alkalis* and *Lime* ſo as to form *Soaps*.

Combine intimately with *Sulphur*.

Combine alſo with *Phoſphorus*, *Unctuous Oils*, and *Camphor*.

Purity aſcertained by ſolution in *Spirit*, or expoſure to *Heat*.

Nature of their compoſition not yet thoroughly inveſtigated; but ſuppoſed to be compounds of *Carbon* and *Hydrogen*.

Of

Of Balſams and Reſins.

Theſe alſo vegetable products, differing from each other principally in reſpect to conſiſtence.

In moſt of their properties, they are analogous to the foregoing, which aſſume theſe forms when combined with different portions of *Oxygen.*

Of theſe and the *Eſſential Oils* the uſes various.

Of Unctuous Oils.

Obtained, ſometimes by boiling, but moſtly by preſſure, from certain *Fruits, Kernels, Pippins,* and *emulſive Seeds.*

Inſipid. Inodorous. Unctuous. Colour and conſiſtence various. Specifically lighter than *Water.*

Inſoluble both in *Water* and *Spirit.*

Become rancid and more conſiſtent, on expoſure to *Air,* apparently by the abſorption of *Oxygen.*

Yield, by diſtillation in cloſe veſſels, an acid

Phlegm, a lighter and a denſer *Oil*, a large quantity of *Hydrogen Gas* mixed with *Carbonic Acid Gas*, and leave behind a ſmall proportion of *Charcoal*.

Afford *Water* and *Carbonic Acid Gas* by inflammation in contact with *Air*.

By mixture with the ſtronger *Acids*, produce, in ſome inſtances, *ſaponaceous Compounds*; in others, occaſion *Combuſtion*.

Unite more perfectly with the *Alkalis*, more eſpecially with *Potaſh* and *Soda*; with the latter, form common *Soap*.

Unite alſo into ſaponaceous compounds with *Baryt*, *Lime*, and *Magneſia*.

Have no action on any of the *Metals* except *Copper* and *Iron*, but aſſiſted by heat diſſolve moſt of the *metallic Oxyds*, and when ſeparated again from theſe, are found to be ſoluble in ſpirit of wine.

Form with *Sulphur* a browniſh red fluid of a diſagreeable ſmell (*Balſamum Sulphuris* P. L.) Combine alſo by the aſſiſtance of heat, with moſt of the *Bituminous Bodies*.

Conſidered as differing principally from the *Eſſential Oils*, in containing different portions of *Mucilage*.

Employed

Employed in *Painting*, *Varniſhing*, *Soap-making*, in *Mechanics*, for *Fuel*, in *Diet*, *Medicine*, &c.

Of Camphor.

Obtained by diſtillation with water, from a particular ſpecies of laurel, *(Laur. Camph. Lin.)* and ſome other vegetables.

Requires the addition of a ſmall quantity of *Lime*, in its ſubſequent refinement by ſublimation.

White. Tranſparent. Friable. Taſte *pungent* and *bitteriſh.* Specifically lighter than *Water.*

Evaporates completely if kept expoſed to the air.

Burns with a white flame, and is entirely conſumed.

Sparingly ſoluble in *Water*; but readily ſo in *Spirit of Wine*, and *Æthers*, in *Unctuous* and *Eſſential Oils.*

Diſſolves both in the *Sulphuric* and *Nitric Acid*, without decompoſition; by repeated diſtillation with the latter, is converted into a peculiar *Acid.* Vide page 36.

Chiefly employed in medicine.

Of Charcoal.

Obtained from *Vegetable*, *Animal*, and *Bituminous* ſubſtances, by incomplete combuſtion, or by the application of heat in cloſe veſſels.

Varies in its form, quantity, and purity, according to the nature of the ſubſtance from which it is prepared.

The charcoal of common wood, *black*, *light*, *brittle*, *ſonorous*, *inſipid*, *inodorous*, and of great *durability*.

Capable of ſuſtaining the moſt intenſe degrees of *Heat* in cloſe veſſels, without alteration; but upon acceſs of *Air*, burns with a white flame, and yields *Carbonic Acid Gas*, leaving behind a ſmall quantity of *earthy ſaline Aſhes*.

Decompoſes the *Sulphuric Acid* and all its compounds, by the aſſiſtance of *Heat*.

Decompoſes alſo the *Nitric Acid* without *Heat*, and ſometimes with ſuch rapidity as to occaſion *Combuſtion*. Detonates with *Nitre*.

Diſſolves, by fuſion, in the *fixed Alkalis*; very readily alſo in *Alkaline Sulphurets*.

Poſſeſſes

Poſſeſſes the remarkable property of correcting *Fœtor*, and of depriving many ſubſtances of *Colour*, eſpecially when uſed in its freſh-burnt ſtate.

Uſed chiefly as an article of *Fuel* for culinary purpoſes, and in certain arts, trades, and manufactures.

The principal animal inflammable ſubſtances are *Fat*, *Butter*, *Bees-wax*, *Sperma-ceti*, and *Phoſphorus*.

Of Fat.

Found in the adipoſe membrane of animals, of different colours and conſiſtence according to the part, the age, and the ſpecies, of the animal from which it is obtained.

When freſh, *unctuous*, *inſipid*, *inodorous*. *Inſoluble* both in *Water* and *Spirit* of *Wine*.

Becomes rancid by keeping.

Liquifies in a moderate heat, and con gealsby cooling.

Yields by diſtillation in a water-bath, an *Aqueous Liquor*, which contains *Mucus*, and is much diſpoſed to become putrid. By ſimple diſtilla-

tion

tion affords a peculiar *Acid* (vide page 41), an *Oil* partly liquid and partly concrete, and leaves a ſmall proportion of *Charcoal.*

Burns readily in contact with *Air.*

Forms ſaponaceous compounds with the ſtronger *Acids*, *Alkalis*, and *Lime.*

Acts on *Lead*, *Copper*, and *Iron*, in their metallic form, and on the *Oxyds* of theſe and moſt of the other *Metals.*

Combines in all proportions, as well with the *Eſſential* as with the *Unctuous Oils.*

Combines alſo intimately with *Sulphur.*

Conſidered as differing from *Unctuous Oils*, principally, in the peculiar *Acid* which it yields.

Uſes nearly the ſame.

Of Butter.

Collected from milk after the ſpontaneous ſeparation of its conſtituent parts.

Differs in no material reſpect from the foregoing, either in its properties or uſes.

Of

Of Bees-Wax.

Depoſited by the *Bee* in the conſtruction of the *Honey-comb*. Colour *yellow*. Taſte *inſipid*. Inſoluble in *Water*.

Becomes white on expoſure to *Air*, or treatment with the *Oxy-muriatic Acid*.

Yields in diſtillation an *acid Phlegm*, a *Butyraceous Oil*, and a ſmall quantity of *Charcoal*.

Unites with the *Alkalis* and forms *Soap*.

Combines in all proportions with *Oils*, *Reſins*, and *Fat*; hence the preparation of ſeveral *Cerates*, *Ointments*, and *Plaiſters*.

Employed alſo in ſeveral of the arts, but principally in making *Wax candles*.

Of Sperma-ceti.

Obtained from the brain of a particular ſpecies of whale, (*Cetus dentatus Lin.*) thence called the Sperma-ceti whale; obtained alſo in ſmall quantity from the oil of the ſame fiſh.

After

After refinement, *white, ſemitranſparent, cryſtalline, friable, inſipid, inodorous, inſoluble* in *Water.*

Changes colour and becomes rancid by keeping.

Little altered by diſtillation, nor eaſily acted upon by *Acids* or *Alkalis.*

Combines in all proportions with *Sulphur*; alſo with *Unctuous* and *Eſſential Oils, Reſins* and *Animal Fat*, like the foregoing.

Suppoſed to have the ſame relation to *Unctuous Oils* that *Camphor* has to the *Eſſential.*

Uſed chiefly for making Sperma-ceti candles, and in the compoſition of *Ointments, Plaiſters,* &c.

Of Phoſphorus.

Obtained, by decompoſing calcined *Bones* by means of diluted *Sulphuric Acid*, evaporating the ſupernatant liquor to the conſiſtence of a ſyrup, mixing it with powdered *Charcoal*, and diſtilling in the open fire; or by adding *Nitrate* or *Acetite* of *Lead*

Lead to common *Urine*, collecting the precipitate, mixing this with *Charcoal* and diſtilling as above.

Purified by cautious re-diſtillation, or ſtraining it, when melted, through leather.

Colour *pearly-white*. *Semitranſparent*. *Waxy*. *Inſoluble* in *Water*. Very *fuſible*.

When expoſed to air, at a low temperature, emits a white fume, and is luminous in the dark; if heated, burns with great rapidity; and in both caſes acquires acid properties. Vide page 37.

Decompoſes the *Nitric Acid*, occaſioning combuſtion by the ſudden ſeparation of its *Oxygen*.

By treatment with the *fixed Alkalis* or *Lime*, yields a permanently elaſtic fluid, which explodes on admiſſion of *Air (Phoſphoric Gas)*.

Diſſolves in *Eſſential* and *Unctuous Oils*, *Spirit* of *Wine*, and *Æthers*.

Unites by fuſion with *Sulphur*.

Unites alſo with ſeveral of the *Metals*, and decompoſes moſt of their *Oxyds*.

Uſed

Uſed only in the preparation of *liquid Phoſphorus*, *Phoſphoric Matches*, and portable *Phoſphoric Bottles*.

Of Spontaneous Analysis.

(*Fermentation.*)

Organiſed bodies, or their products, alone capable of becoming the ſubjects of this *Analyſis*.

Takes place under particular circumſtances of *Temperature*, *Humidity*, *Accumulation*, and *Expoſure to Air*.

Diviſible into different ſtages; the *Vinous*, productive of *Alcohol*; the *Acetous*, affording *Vinegar*; and, the *Putrid*, generating *Ammoniac*.

Theſe changes may be promoted or retarded by various means. *Ferments*.

Of the Analysis of Mineral Waters.

Firſtly, by *Teſts* or *Re-agents*.

Secondly, by *Diſtillation* and ſubſequent examination of their *gaſeous* and *ſolid* contents.

THE END.

CHEMICAL NOMENCLATURE.

TAB. I.

	SIMPLE BODIES		— RENDERED INTO GAS BY CALORIC.		— COMBINED WITH OXYGEN.		— GASEOUS OXYGENATED.		— OXYGENATED WITH BASES.		— COMBINED, BUT NOT RENDERED ACID.	
	NEW NAMES.	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.
	Light.											
	Caloric.	*Matter of heat.*										
	Oxygen.	*Base of vital air.*	Oxygen gas.	*Dephlogisticated air.*								
	Hydrogen.	*Base of inflammable air.*	Hydrogen gas.	*Inflammable air.*	Water.	*Water.*						
ACIDIFIABLE BASES.	Azote, or Nitric radical.	*Base of phlogisticated air.*	Azotic gas.	*Phlogisticated air.*	Rafe of nitrous gas. Nitric, and nitrous acid.	*Base of nitrous air.* *Dephlogisticated and phlogisticated nitrous acid.*	Nitrous gas. Nitrous acid gas.		Nitrate of potafh. Nitrate of fodа, &c. Nitrite of potafh, &c.	*Cubic nitre.* *Cubic nitre*, &c.	Ammonia.	
	Carbon, or Carbonic radical.	*Pure charcoal.*			Carbonic acid.	*Fixed air.*	Carbonic acid gas.	*Fixed air, or aërial acid.*	Carbonate of lime, potafh, iron, &c.	*Mild calcareous earth, mild alkali*, &c.	Carburet of iron.	*Plumbago.*
	Sulphur, or Sulphuric radical.				Sulphuric acid. Sulphureous acid.	*Vitriolic acid.* *Volatile vitriolic acid.*	Sulphureous acid gas.	*Sulphureous acid gas.*	Sulphate of potafh, &c. Sulphite of potafh, &c.	*Vitriolated tartar*, &c. *Stahl's sulphureous salt*, &c.	Sulphuret of iron, antimony, &c. Sulphurated hydrogen gas. Sulphurate of potafh, fodа, &c.	*Iron pyrites, common antimony*, &c. *Hepatic gas.* *Alkaline hepars.*
	Phosphorus, or Phosphoric radical.				Phosphoric acid. Phosphorous acid.	*Phosphoric acid.* *Volatile phosphoric acid.*			Phosphate of potafh, fodа, &c. Phosphite of potafh, fodа, &c.	*Phosphorated kali, fodа*, &c.	Phosphorated hydrogen gas. Phosphuret of iron.	*Phosphoric gas.* *Siderite.*
	Muriatic radical.				Muriatic acid. Oxy-muriatic acid.	*Marine acid.* *Dephlogisticated marine acid.*	Muriatic acid gas. Oxy-muriatic acid gas.	*Marine acid gas.* *Dephlogisticated marine acid gas.*	Muriate of potafh, fodа, &c. Oxy-muriate of potafh, &c.	*Salt of sylvius, Common salt*, &c.		
	Boracic radical.				Boracic acid.	*Sedative salt.*			Borate of potafh, fodа, &c.	*Vegetable borax, Common borax*, &c.		
	Fluoric radical.				Fluoric acid.	*Spathic acid.*	Fluoric acid gas.	*Spathic acid gas.*	Fluate of lime, &c.	*Fluor spar*, &c.		
	Succinic radical.				Succinic acid.	*Salt of amber.*			Succinate of potafh, &c.			
	Acetic radical.				Acetous acid. Acetic acid.	*Distilled vinegar.* *Radical vinegar.*			Acetite of potafh, ammonia, lead, &c. Acetate of potafh, &c.	*Diuretic salt.* *Mindererus's spirit.* *Sugar of lead*, &c.		
	Tartaric radical.				Tartarous acid.				Acidulous tartrite of potafh. Tartrite of potafh. Tartrite of fodа.	*Cream of tartar.* *Soluble tartar.* *Rochelle salt.*		
	Pyro-tartaric radical.				Pyro-tartarous acid.	*Empyreumatic acid of tartar.*			Pyro-tartrite of potafh, &c.			
	Oxalic radical.				Oxalic acid.	*Acid of sugar.*			Acidulous oxalate of potafh. Oxalate of fodа, lime, &c.	*Salt of sorrel.*		
	Gallic radical.				Gallic acid.	*Acid of galls.* *Astringent principle.*			Gallates of potafh, lime, iron, &c.			
	Citric radical.				Citric acid.	*Acid of lemons.*			Citrate of potafh, lime, &c.			
	Malic radical.				Malic acid.	*Acid of apples.*			Malate of potafh, &c.			
	Benzoic radical.				Benzoic acid.	*Acid, or flowers of benjamin.*			Benzoate of lime, &c.			
	Pyro-lignic radical.				Pyro-ligneous acid.	*Acid of wood.*			Pyro-lignite of potafh, iron, &c.			
	Pyro-mucic radical.				Pyro-mucous acid.	*Spirit of honey, sugar*, &c.			Pyro-mucite of magnesia. Ammoniacal pyro-mucite, &c.			
	Camphoric radical.				Camphoric acid.	*Acid of camphor.*			Camphorate of potafh, &c.			
	Lactic radical.				Lactic acid.	*Acid of milk.*			Lactite of potafh, &c.			
	Saccho-lactic radical.				Saccho-lactic acid.	*Acid of sugar of milk.*			Sacholate of lime, &c.			
	Formic radical.				Formic acid.	*Acid of ants.*			Formite of ammonia, &c.			
	Prussic radical.				Prussic acid.	*Acid of Prussian blue.*			Prussiate of potafh, of iron, &c.	*Prussian alkali.* *Prussian blue.*		
	Sebacic radical.				Sebacic acid.	*Acid of fat.*			Sebate of fodа, of lime, &c.			
	Lithic radical.				Lithic acid.	*Acid of urinary calculus.*			Lithiate of fodа, &c.			
	Bombic radical.				Bombic acid.	*Acid of silk worms.*			Bombiate of iron, &c.			

CHEMICAL NOMENCLATURE.

	SIMPLE BODIES		— RENDERED INTO GAS BY CALORIC.		— COMBINED WITH OXYGEN.		OXYDS WITH DIFFERENT BASES.		SIMPLE BODIES OXYGENATED WITH BASES.		— COMBINED, BUT NOT RENDERED ACID.	
	NEW NAMES.	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.	*NEW NAMES.*	FORMER NAMES.
METALLIC SUBSTANCES.	Arsenic.	*Regulus of arsenic.*			Oxyd of arsenic. Arsenic acid.	*White arsenic.* *Arsenical acid.*	Sulphurated oxyd of arsenic, yellow and red. Arsenical oxyd of potash.	*Orpiment, Realgar.* *Liver of arsenic.*	Arseniate of potash, &c.	*Arsenical salt of Macquer,* &c.	Alloy of arsenic and tin.	*Arsenuated tin.*
	Molybdena.	*Regulus of molybdena.*			Oxyd of molybdena. Molybdic acid.	*Calx of molybdena.*	Sulphuret of molybdena.	*Molybdena.*	Molybdate of potash, &c.		Alloy, &c.	
	Tungsten.	*Regulus of tungsten,* *Scheele.*			Oxyd of tungsten. Tungstic acid.	*Yellow calx of tungsten.*			Tungstate of lime, &c.		Alloy, &c.	
	Manganese.	*Regulus of manganese.*			Oxyds of manganese of different colours.	*Calces of manganese.*					Alloy of manganese and iron.	
	Nickel.	*Regulus of nickel.*			Oxyd of nickel.	*Calx of nickel.*					Alloy of nickel and iron.	
	Cobalt.	*Regulus of cobalt.*			Oxyds of cobalt.	*Calces of cobalt.*	Alkaline cobaltic oxyds.	*Precipitates of cobalt redissolved by alkalies.*			Alloy, &c.	
	Bismuth.	*Regulus of bismuth.*			Oxyds of bismuth, yellow and white.	*Yellow calx of, magistery of bismuth.*	Sulphurated oxyd of bismuth.	*Bismuth precipitated by liver of sulphur.*			Alloy, &c.	
	Antimony.	*Regulus of antimony.*			White oxyd of antimony by nitrous acid, by muriatic acid, by sublimation, and by vitrification.	*Diaphoretic antimony,* *Powder of algaroth,* *Argentine flowers,* *Glass of antimony.*	Sulphurated oxyd of antimony.	*Kermes mineral,* *Golden sulphur of antimony,* *Liver of antimony.*			Alloy, &c.	
	Zinc.	*Zinc, Spelter.*			Oxyd of zinc. Sublimed oxyd.	*Calx of zinc.* *Flowers of zinc.*	Sulphurated oxyd of zinc.	*Precipitate of zinc by liver of sulphur.*			Alloy, &c.	
	Iron.				Oxyds of iron of different colours.	*Martial æthiops, colcothar,* &c.	Sulphurated oxyd of iron.				Alloy, &c.	
	Tin.				White oxyd of tin.	*Calx of tin.*	Yellow sulphurated oxyd of tin.	*Aurum mosaicum.*			Alloy, &c.	
	Lead.				Oxyds of lead.	*White lead, minium, litharge,* &c.	Sulphurated oxyd of lead.				Alloy, &c.	
	Copper.				Oxyds of copper, red, green, and blue.	*Calces of copper, red, green, and blue.*	Ammoniacal oxyd of copper.	*Cuprum ammoniacum.*			Alloy, &c.	
	Mercury.	*Quicksilver.*			Oxyds of mercury, black, yellow, and red.	*Æthiops per se.* *Turbith mineral.* *Calcined quicksilver.*	Sulphurated oxyd of mercury, black and red.	*Æthiops mineral,* *Cinnabar.*			Amalgams.	
	Silver.				Oxyd of silver.	*Calx of silver.*	Sulphurated oxyd of silver.					
	Gold.				Oxyd of gold.	*Calx of gold.*					Alloy, &c.	
	Platina.				Oxyd of Platina.	*Calx of platina.*					Alloy, &c.	
EARTHS.	Silica.	*Vitrifiable earth, quartz.*										
	Alumina.	*Argillaceous earth, clay.*										
	Baryt.	*Ponderous earth.*										
	Lime.	*Calcareous earth.*										
	Magnesia.	*Muriatic earth.*										
ALKALIS.	Potash.	*Vegetable alkali.*										
	Soda.	*Mineral alkali.*