I. A General Law of Nature: — The particles of all bodies are always capable of separation by heat.

Inferences:

1. Solidity may be considered to arise not from the actual connexion, but from the mutual attraction of the particles of bodies.
2. The particles of all bodies are never in actual contact with each other; because heat is never completely absent.
3. Every body exists either as a solid, or a liquid, or in the form of an elastic aëriform vapour according to the proportion between the mutual attractive force of the particles & their mutually repulsive force arising from heat.

Remark:

It is not easy to comprehend these phenomena unless we deem them the effects of a real & material substance or very subtile fluid insinuating itself between the particles of all bodies: Yet, whether the existence of this fluid be, or be not hypothetical, the phenomena of nature may by it be explained very satisfactorily.

II. Caloric ——— is the cause of heat: whatever it may be, it exists; though, like the cause of gravitation, it be itself unknown. It may be considered as the cause of repulsion.

Inferences:

1. Bodies would become liquid at an indivisible point or degree of the thermometer if there existed no other powers than the attractive & repulsive abovementioned: Water at the moment of losing the form of ice would boil & be transformed into an aëriform fluid.
2. This third power is the pressure of the atmosphere: An additional quantity of caloric being necessary to overcome this pressure; and, to cause the liquid to become aëriform: It is the cause of the permanency of liquids, which would otherwise be dissipated by the caloric which they possess:

Without

Without it aëriform fluids could not be detected, nor restrained from an indefinite expansion or dissipation; and, unless gravity be supposed to affect the particles, without this pressure aëriform fluids could not form an atmosphere. Ether, for example would always exist in an aëriform state, were it not for this pressure; and, by many experiments, the aëriform state of bodies is a modification dependent on the degree of temperature; and hence 3. I may be esteemed a general principle.

3. Hence the composition of our atmosphere is capable of a very beautiful elucidation: It may be conceived to consist of every substance capable of preserving the aëriform state in the common temperature & under the usual pressure which it experiences: Indeed, by the method of either analysis or synthesis, we are able, even at present, to resolve the atmospheric fluid into two others which are aëriform and of directly opposite qualities.

4. Hence, also, the explication of the sensation occasioned upon our organs by heat: It is caused by the passage of caloric from heated bodies to others less heated to restore the equilibrium.

III. Free caloric..... is such portion of the cause of heat as is not combined with bodies. a state in which it is never obtained

Inference:

It is not possible, in our system of nature to obtain free or uncombined caloric.

IV. Combined caloric..... is found combined with every substance.

V. Specific caloric ... is the respective quantities of caloric required to raise a number of bodies of the same weight to an equal degree of temperature.

VI. Gas..... expresses generically elastic aëriform fluids.

Inferences.

1. Gas expresses the fullest saturation of any body with caloric.

2. The

2. The different species of gafes are naturally to be denominated from the substances with which the calorie is combined to form them, and each such substance is called the base of the gas.

VII. Oxygen..... is the base of one of the known constituent gafes of the atmosphere (3. II.), which is highly respirable and afsistant in combustion & calcination.

Remarks:

1. One of the general properties of this base is to form acids by its combination with various substances in combustion: Thus oxygen & caloric form oxygen gas; &c. &c. Oxygen gas itself may be decomposed by sulphur, phosphorus, charcoal, metals, &c.

2. In every acid care must be taken to distinguish between the acidifiable base, & the acidifying principle or oxygen.

3. In the new chemical language, — every combination of oxygen with a combustible substance is called oxygenation; also, to oxygenate a substance is to convert it into an acid: There are four degrees of oxygenation expreßible in this language.

VIII. Acids..... is a generic term for the products or results of the combustion or oxygenation of any substance. Acids may have, first, known bases; secondly, unknown bases; for each of which a particular mode of designation is prepared.

Remarks:

1. Bodies convertible into acids are found to be susceptible of four degrees of saturation with oxygen (3. VII); and the properties of the results are found to vary with this susceptibility of the bodies to imbibe oxygen; and

IX. Oxyd..... signifies any metallic calx or combination of metal, or even any other substance with oxygen in the first or lowest degree, by which they approach the nature of salts and are not converted into acids: The peculiar and permanent colours of the oxyds of the same metal depend upon the degree of oxygenation; and to discriminate them, the name of the metal and the colour of the oxyd are combined; thus the black or red oxyd of iron, &c.

Of

Of the 2nd. 3rd & 4th. degrees of saturation of acids

First ~~3rd degree~~; When the base of the acid is known:

Under-saturation is designed by adding ous } to the base; as { sulphurous acid
& Complete saturation ---------- ic } sulphuric acid

Secondly, when the base of the acid is not known, there being always an hitherto inseperable portion of oxygen combined with such acids, this natural state corresponds to the 2nd degree of saturation, & is simply denominated by the known name of the acid; and the

Under saturated, of this clafs (or 3rd. degree of saturation) is characterized by adding ic to the name of the acid itself;

& the Complete saturation (or 4th. or highest degree) by writing the term Oxygenated before the name of the acid.

~~Muriatic~~. Thus from muria or sea-salt, we have

the 3rd degree expreſsed by muriatic acid

& the ~~4th~~ degree ------ by oxygenated muriatic acid.

X. Azote ------ is the base of the other constituent of the atmosphere (3. II), the chemical properties of ~~this~~ gas are little known; but, it is ~~known~~ found to be non-respirable, and non-afsistant in combustion & calcination.

Remark:

Azote with caloric forms azotic gas.

XI. Hydrogen ---- is that base, or generative principle of water, which, combined with oxygen, forms water: For, it is now known that, water decomposed yields hydrogen; & hydrogen combined with oxygen produces water. Hydrogen & caloric form hydrogen gas, or gas whose base is hydrogen. (Page 103)

XII. Carbone ____ is that simple & pure element which exists in great plenty in well made charcoal; and, which enters into chemical combinations, especially with oxygen or the acidifying principle, forming carbonic acid.

XIII. Alloys ____ denote the results of the combinations of metals with each other.

XIV. Amalgams ____ are the alloys of mercury with metals.

XV. Sulphurets (hitherto called Pyrites) } binary combinations of metals or other substances with } Sulphur, Phosphorus, Charcoal } unoxygenated
Phosphorets ____
Carburets ____

Remarks:
Thus we have the sulphuret of potash, of ammoniac, &c.

XVI. Sulphurated hydrogen gas } denotes the respective combination of sulphur, phosphorus & charcoal with hydrogen in the state of gas.
Phosphorated ____
Carbonated ____

Remarks:
1° Sulphurated hydrogen gas smells like rotten-eggs & constitutes the chief properties of several mineral waters.
2° Phosphorated hydrogen gas takes fire when presented to oxygen gas, or even to atmospheric air, & smells like putrid fish

XVII. Alkohol ____ is an inflammable liquor obtained by distilling the fluid produced by the fermentation which takes place when any saccharine matter is mixed with water.

XVIII. Alkalies ____ are procured, by lixiviation, from the ashes of burnt plants

XIX. Salifiable principles ____ are the acids: and the salifiable bases ____ are Potash, soda, ammoniac, lime, magnesia, barytes & alumine, or argill; also all the metallic bodies.

XX. Neutral salts ____ are formed by the union of earthy and metallic bodies with acidifiable substances combined with oxygen.

Remarks:

Remarks:

1º Sulphats, Phosphats, &c. } Denote all the neutral salts having in their composition the { sulphuric acid, phosphoric acid, &c. } i.e acid oxygenated in the 2nd degree.

The species are distinguished by the names of the salifiable bases; viz. sulphat of potash, &c.

2º Sulphites, Phosphites, &c. } Denote all the neutral salts having in their composition the { sulphurous acid, phosphorous acid, &c. } i.e acid oxygenated in the 1st or lowest degree.

Thus we have the sulphite of potash, &c. and

3º Oxygenated muriat of potash, ——— nitrat of soda, &c. } Distinguish all the neutral salts (either of their composition from the 3rd degree of oxygenation) ~~in the~~

{ oxygenated muriatic acid, ——— nitric acid, &c. } with the salifiable bases { potash, soda, &c.