Remarks upon chemical nomenclature, according to the principles of the French neologists / [Richard Chenevix].

Dr Hope

Edinburgh

from the author

REMARKS

UPON

CHEMICAL NOMENCLATURE,

ACCORDING TO

THE PRINCIPLES

OF

THE FRENCH NEOLOGISTS.

By RICHARD CHENEVIX, Esq.
F. R. S. M. R. I. A. &c.

What custom wills, in all things should we do't,
The dust on antique time would lie unswept,
And mountainous error be too highly heaped
For truth to overpeer.——

Coriolanus, Act. II. Scene 3.

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REMARKS

UPON

CHEMICAL NOMENCLATURE.

INTRODUCTION.

SINCE Chemiſtry has ceaſed to be a ſcience of myſtery and ſecrets, as many methods have been deviſed to engage the world in its purſuit, as formerly were practiſed to confine it to a few. And although the methodizing of ſo ſimple a part, as mere names, may at firſt ſight appear trivial, yet it has not a little contributed to remove ſome of the obſtacles, which formerly impeded the progreſs of the ſtudent. At firſt,

the advantages of methodical nomenclature may have been thought hypothetical; but the experience of more than twelve years has ſufficiently demonſtrated its utility. The unſkilled are not now deterred from entering upon the ſcience, from an apprehenſion of being loſt in a wilderneſs of detail; but cheerfully go forward in that career, at the entrance of which they perceive ſo much ſymmetry and order. This improvement, among many others, we owe to Meſſrs. Lavoiſier, Berthollet, Fourcroy, and Guyton; and we are indebted to Dr. Pearſon, for having adapted, to the Engliſh language, the reform which thoſe illuſtrious chemiſts had propoſed to the French Academy. A change in nomenclature was a natural conſequence of change of opinion; and the revolution, which happened in chemical tenets, could not but be followed by a reviſion of chemical language.

guage. It is true, that the legiſlators were not regularly deputed by the whole body of Chemiſts. But, in revolutions of every kind, we ought to rejoice, when the ſupreme power, inſtead of being bandied about among the multitude, is aſſumed by perſons adequate to its diſcharge.

The general uſe, and the tried advantages of the new nomenclature, form a ſtrong argument for retaining it. The ſame objection may at all times be made againſt any fundamental change, as was ſtarted againſt the preſent ſyſtem of denomination, when it was firſt propoſed; namely, that all the books, written in the language to be exploded, would be rendered uſeleſs, as the terms would become obſolete. Nor can this argument be weakened by the ſhortneſs of the period, during which the preſent ſyſtem has prevailed; for the publications of the laſt twenty years, beſides preſent-

ing, in a modern dreſs, facts long ſince known, have given names and immortality to as great and as valuable a ſeries of diſcoveries, as the whole former æra of chemical knowledge.

It is by no means from a ſuppoſition, that excellent works upon Chemical Nomenclature do not exiſt in this country, that the preſent eſſay is undertaken. Dr. Pearſon has contributed much, towards eſtabliſhing a baſis of accurate chemical phraſeology in our language. Dr. St. John has preſented us with a valuable tranſlation of the original memoirs of the French authors. Many detached obſervations are to be found in the periodical and other publications. But, from the nature of the ſubject, from the circumſtances under which the ſyſtematic language was formed, and from the diſcoveries which, ſince its formation, have been made in chemiſtry, we are not to expect perfection.

fection. And, as writers ſeem frequently to forget the principles upon which the whole ſyſtem, and the particular appellations derived from it, are founded, it may not be uſeleſs to preſent a view of thoſe errors which are moſt frequently committed.

We ſhall, therefore, now proceed to point out,

1ſt. The moſt common miſtakes, ariſing chiefly from inattention, but, in ſome degree, from miſapplication of the principles.

2d. The terms, which, in the ſyſtem of nomenclature, propoſed in our language, do not ſeem to be the moſt appoſite to render the French expreſſion. And,

3d. Some denominations, which, in the French ſyſtem of nomenclature, and in our tranſlation of it, are manifeſt deviations from the fundamental princi-

ples, on which the entire ſyſtem of methodical nomenclature was intended to be formed.

I have adopted this diſtribution of the ſubject, in order to conduct the mind from glaring improprieties to leſs ſtriking errors. For it is by becoming fully ſenſible of groſſer faults, that we ſhall be enabled to perceive minuter imperfections.

When theſe points are eſtabliſhed, a few remarks ſhall be offered upon ſome dangerous doctrines, contained in certain treatiſes, expreſsly written upon the preſent ſubject; and the eſſay ſhall conclude with obſervations upon other matters, relating to chemical language.

A few deviations, and but a few, from the above order of arrangement, I muſt however make. The only cauſe ſhall be, when I think, that I can place in a more ſtriking point

of

of view, the propriety of ſome terms, which I wiſh to defend.

In treating of the ſeparate heads, into which the ſubject has been divided, the uſual order of chemical arrangement ſhall be obſerved. Simple metallic ſubſtances ſhall be firſt mentioned; and, after them, the binary metallic compounds. We ſhall then paſs to the conſideration of the metals, followed by the more complicated bodies of the vegetable and animal kingdoms.

Beſides this mode of arrangement, the errors, in every part of the ſubject, may further be conſidered in two diſtinct points of view: As errors, which are no further reprehenſible, than as they are deviations from thoſe leading principles, which form the baſis, from which we ſhould not depart; and errors, not merely deviations from rule, but calculated to create falſe notions in the mind of the beginner.

The importance of this laſt ſpecies of faulty nomenclature is ſelf-evident. The ſtudent is told, at his outſet in the ſcience, that, to aid his memory, ſuch a connection has been eſtabliſhed between ſubſtances and their names, that, upon the datum of either, the other muſt be known. He proceeds with this perſuaſion, and inferences are drawn accordingly. But he has not advanced very far, before one of the following inconveniences ariſes. He perceives, that the rule of relation between compounds and their names is not ſo intimately obſerved as he ſuppoſed; and, by being frequently deceived, learns to miſtruſt it altogether; or, what is ſtill worſe, he carries away with him erroneous ideas, which can never be corrected, without an effort of the mind.

To give examples of this ſpecies at preſent, would be to anticipate the ſub-

ject;

ject; many will occur in the courſe of the ſtrictures I am about to offer, and my intention is to take notice of them under this ſpecial point of view, as we proceed.

CHAPTER I.

GENERAL OBSERVATIONS AND RULES.

THE philoſophers, who have not yet been able to reconcile their ideas to the Antiphlogiſtic Theory, may ſtill be permitted to reject the new nomenclature, ſince it is founded on principles, which they have not adopted. The neceſſary ſtep, previous to any attempts at convincing them of the rectitude of the nomenclature, would be to prove to them the truth of the doctrines that gave riſe to it; and it is not my intention to enter into chemical controverſy. I muſt ſuppoſe the theory of Lavoiſier to be adopted by thoſe, to whom this work is addreſſed; and, I am ſure, they will receive, with indulgence, hints offered with a view to transfer the preciſion,

ciſion, which marks every ſtep in the ſcience, which he has erected, to the terms, by which every part ſhould be expreſſed. For thoſe, however, who have grown grey in the ſervice of ſcience, under the banners of the now neglected ſyſtem, allowances muſt be made. If conviction has cauſed a change of opinion in ſome, they have acquired full knowledge of the merits of either doctrine in their ſearch after truth. Before the new principles could be embraced, they muſt have been ſtudied and underſtood. But thoſe principles were conveyed by language, which had long been the type of other ideas, and which was too familiar to be diſcarded for new expreſſions. The doctrine of Stahl is already confined to the hiſtory of the ſcience; but the old names require the lapſe of time to become thoroughly antiquated.

RULES.

1. The denominations of ſimple bodies ſhould denote ſome ſtriking quality, or be altogether inſignificant.

N. B. This is a rule, founded on the eſſence of the thing. But, for the ſake of the ſtructure of language, the radical name ſhould be ſuch as to admit of eaſy derivatives.

2. Combinations of ſimple combuſtible bodies, one with another, or with an alkali, if they are not metallic, are to be denoted by the name of one of them, which muſt be made to terminate in URET, and by the name of the other, preceded by the particle OF.

N. B. Metallic combinations are called ALLOYS or AMALGAMS.

3. The combinations of all combuſtible bodies with oxygen are to receive compound names, expreſſive of their degree

degree of oxygenizement; the firſt, if not endowed with acid properties, being an oxide.

4. The firſt ſtate of acidity is to be marked by the name of the ſubſtance, and ſhould terminate in EOUS or OUS; the ſecond ſhould terminate in IC.

5. The generic termination, joined to the name of the radical, for ſalts formed by the firſt genus of acids, is ITE; that of the ſecond is ATE.

6. Undecompoſed acids are to bear the name of the ſubſtance, from which they were originally extracted; or, in which they are now commonly found.

7. Vegetable ſubſtances, on account of being combinations of the ſame materials in different modes and proportions, cannot be brought under the preſent rules; and therefore, at leaſt till further light be thrown upon them, they are ſubject to thoſe, already laid down

down for the denomination of ſimple ſubſtances.

8. Animal ſubſtances are in the ſame predicament.

I do not at preſent recollect, that any other rules have been followed in conſtructing the nomenclature. It is true, that, in the Memoir of Guyton de Morveau, the ſubject has been treated more at length; but the eſſence may be reduced to the preceding aphoriſms. We ſhall now proceed to the inveſtigation we at firſt propoſed.

CHAPTER II.

FAULTS WHICH ARE THE MOST COMMONLY FOUND IN THE PERIODICAL PUBLICATIONS, AND PROCEEDING CHIEFLY FROM INATTENTION, BUT PARTLY FROM MISAPPLICATION OF THE RULES.

As, in the latter part of this work, ſlighter errors will be pointed out, and the principles will be more narrowly diſcuſſed, it may not be neceſſary to dwell for a great length of time upon this head. It is eſſential, however, that ſome few obſervations be made, and examples given, of the moſt common miſtakes. I ſhall ſelect them chiefly from ſome of the moſt reſpectable living authors, who have written upon chemiſtry, originally in the Engliſh language;

language; and whoſe works are the moſt deſervedly and the moſt generally diffuſed. I ſhall make ſome obſervations likewiſe, upon ſuch inſtances of faulty nomenclature, as are to be found in different contributions to thoſe of our periodical publications, which bear the moſt unequivocal marks of reſpectability. Faults, however, in French publications, ſhall not paſs unnoticed. For ſuch is the ſimilarity between the chemical terms in each language, that whatever appellation a ſubſtance receives in French, we immediately adopt, with the alteration of perhaps a letter or two.

In ſpeaking of the gaſes, it is by no means uncommon to ſay OXYGENOUS, HYDROGENOUS, AZOTIC GAS; thus creating adjectives without neceſſity. It is perfectly conſiſtent with the idiom of the Engliſh language, to join two ſubſtantives by a hyphen; and, from

their

their union, to form a new one: as, OAK-PLANK, DEAL-BOARD. OXYGEN-GAS, HYDROGEN-GAS, AZOTE-GAS, are all denominations of the ſame kind, and would be much more appropriate and philoſophical; as we ſhould thus avoid the terminations EOUS, OUS, and IC, which, in the general ſyſtem, are marked as denoting ſpecific degrees of oxygenizement of the acids, and which ſhould be religiouſly preſerved for the purpoſe, to which they are appropriated.

INFLAMMABLE AIR, HEAVY INFLAMMABLE AIR, VITAL AIR, MEPHITIC AIR, MEPHITIC ACID, are terms which were in uſe during a period, when the fallacy of the old doctrine began to be perceived, but before the new theory was firmly eſtabliſhed. They require the ſame reſtriction with all other old denominations, and which I ſhall take a future opportunity to mention.

FIXED

FIXED ALKALI is a name, frequently beſtowed upon both potaſh and ſoda. It is a deſignation, derived from a property which does not exiſt. Neither of thoſe alkalis is fixed. What indeed is termed POTASH, or is denominated SODA, is not eaſy to be volatilized. But I have frequently driven off every particle of what is * ſoda, at a good red heat; and potaſh is ſtill leſs fixed. This name, therefore, which is applied as generic, is one of thoſe, liable to propagate error.

POTASH is, in chemical writings, uſed to expreſs no leſs than three different ſubſtances, and not one of them is potaſh: to wit, lapis cauſticus, the real potaſh of commerce, and ſalt of tartar. They all indeed contain potaſh, but, being mixed or combined with other matters, are potaſh, plus, what-

* Prepared in Berthollet's manner.

ever

ever elſe they happen to contain *. A ſingle inſtance of the miſtakes, to which this indiſcriminate application of terms may give riſe, will be ſufficient. In one of the moſt uſeful works we poſſeſs, but not originally written in our language, the tranſlation from the German of "Gren's Chemiſtry," we are told, that, if to a ſolution of chalk we add potaſh, the chalk will reſume its original form. This, in the ſtrict obſervance of terms, is not true. If potaſh be added, lime and not chalk will be precipitated. This confuſion ariſes from applying the name of the alkaline baſes to potaſh, as if it did not contain the acid, combined with it in the carbonate. The impropriety of a SOLUTION OF CHALK we ſhall mention under another head.

Other names have been propoſed in-

* See Philoſophical Tranſactions for 1801.

ſtead

ſtead of POTASH and SODA; but the diſcuſſion of their merits more properly belongs to another place.

Compound terms to expreſs ſimple ſubſtances are inelegant and diffuſe, unleſs when ſparingly adopted, and only under the reſtrictions to be laid down for old appellations. Hence, BARYTIC EARTH, STRONTIAN EARTH, &c. are much better deſigned by the ſimple names of BARYTES or STRONTIA, &c. PONDEROUS EARTH, TERRA PONDEROSA, are uſeleſs prolixities. BARYTIC LIME-WATER, STRONTIAN LIME-WATER, to expreſs a ſolution of barytes, of ſtrontia in water, are highly improper. In fact, they denote, if any thing, a ſolution of lime, mixed with barytes or ſtrontia. Such appellations are intrinſically more pernicious, than barbariſms greater even than themſelves. BARYTES-WATER, STRONTIA-

WATER,

WATER, are, like LIME-WATER, the proper terms.

In the ſecond edition of Mr. Parkinſon's Chemical Pocket-book, page 5, we find ALUMINATES, as the generic name for all ſalts, having alumina for baſis. Whether to claſs neutral ſalts by the acid or by the baſis be the more proper mode of arrangement, will be conſidered hereafter. And, at all events, as terms to expreſs each alkaline or earthy genus may ſometimes be neceſſary, due care ſhould be taken to avoid ſuch a formation of them, as would claſh with other parts of the ſyſtem.—The term ALUMINATE implies ALUMINIC ACID, and therefore is reprehenſible. SILICATED ALKALI, a term introduced before the formation of the new nomenclature, but ſince, generally uſed to expreſs what, in other words, is termed SOLUBLE GLASS, or LIQUOR SILICUM, now ſtrictly means a combination

nation of alkali with the ſilicic acid, which is abſurd. AMMONIATED ſolution is, for the ſame reaſon, much to be reproved.

VITRIOLIC ACID, MARINE ACID, are ſubject to the obſervations, which ſhall be offered upon antiquated nomenclature. NITROUS ACID is ſtill more faulty, as it is much believed, that the thing deſigned by the term, does not exiſt. The red fuming liquor, which by ſome is ſuppoſed to deſerve the title, is merely nitric acid, impregnated with nitrous gas; and no participation of principles takes place between the two ſubſtances, to form azote leſs oxygenized than nitric acid, but more than nitrous gas. The ſubſtances remain in the ſame ſtate as that, in which they exiſted before impregnation took place. For the ſame reaſon, ACID NITRATE OF POTASH and ACID SULPHATE OF SODA cannot be admitted

into

into the nomenclature; for theſe neutral ſalts are incapable of combining with a greater portion of acid than that, which merely ſaturates the alkali. No ſalt really deſerves the name of ACID or SUPER ſalt, unleſs the ſuperabundant acid be inſeparable by cryſtallizations, repeated, as I may ſay, ad infinitum. Such are ſupertartrite of Potaſh, ſuperſulphate of Potaſh, and a few others.

OXYGENATED NITROUS GAS is a ſubſtance, of which I confeſs myſelf totally ignorant, as alſo OXYGENATED SULPHURIC, OXYGENATED PHOSPHORIC ACID, &c.

NITRO-MURIATIC acid is admiſſible, inaſmuch as it does not offend the principles, and is a better expreſſion than AQUA REGIA, formerly in uſe. But NITRO-MURIATES are the names of ſalts not in exiſtence. When a ſolution of alkali is poured into nitro-muriatic acid, a nitrate and a muriate, but

but no nitro-muriate of that alkali is formed. When gold is diſſolved in nitro-muriatic acid, and the ſolution is evaporated, it is a muriate of gold which remains; or a nitrate; or a mixture of both; but no ſuch thing as a nitro-muriate. This is well aſcertained by experiment; therefore the name muſt be expunged from the catalogue of ſalts.

When thoſe ſubſtances which were formerly called half metals are in their metallic ſtate, it is uſual to deſign them by the epithet REGULUS *, or its ad-

* This word appears to be derived from REX. As gold was the king of Metals, ſo were theſe, LITTLE KINGS. The other metals were named after the gods, as Diana, Venus, Jupiter, Saturn, Mars, Mercury, &c. Gold was the king of theſe, and, in their train, came the *kinglets*. The French have a word exactly correſponding with REGULUS, thus, REX, ROI; REGULUS, ROITELET.

jective

jective REGULINE. Alchemiſts might perhaps have found ſome analogy between a ſemi-metal and a little king; but, in the ſtrict ſenſe of modern chemiſtry, it is tautology to prefix this, or any epithet, to pure and ſimple bodies. The neceſſity of ſuch diſtinction originated in our having given the name of the metal itſelf to ſome ſubſtance, of which it conſtituted but part. Thus, the WHITE OXIDE OF ARSENIC, or, as it is termed by ſome, ARSENIOUS ACID, formerly bore the name of ARSENIC; and, at this moment, we frequently ſee it ſo denominated, even in works of ſcience. But, in this oxide, there are but 75.25 of arſenic, the reſt being oxygen; and, if this be termed ARSENIC, ſome epithet muſt be joined to the *real* ſubſtance, in order to diſtinguiſh it from the compound. The ſame is the caſe with many other metals. Sulphuret of Antimony, Sulphu-

ret of Cobalt, were named ANTIMONY, COBALT, &c. and to deſign what truly is ANTIMONY or COBALT, one or other of the epithets, PURE, METALLIC, REGULINE, were of neceſſity prefixed to the name of the metal. This cuſtom, however, ſhould now be laid aſide, as our ideas in chemiſtry become more preciſe, and more ſtable; and our language, leſs mutable and leſs capricious.

The names of the metals are, in ſome words, a little altered from thoſe, originally propoſed by the perſons, to whom belongs the excluſive right of giving them a name. Diſcoveries in ſcience are as ſacred in the empire of human knowledge, as any province of literary property; and it is not permitted to men of learning to invade the territories of their neighbours. Hence the name of any ſubſtance ſhould, unleſs it militate againſt all laws and regulations, remain in its full integrity, ſuch as it

was

was firſt created by the author. URANIUM, TITANIUM, TELLURIUM, were the names originally propoſed by the celebrated Klaproth for his new metals. Yet we frequently ſee them written URANITE, SYLVANITE, TITANITE, together with TUNGSTENITE, &c. but as theſe words have been adopted from the Engliſh ſyſtem of nomenclature, I ſhall reſerve them for their proper place.

The word CALX inſtead of OXIDE, comes under the ſame rules with VITRIOLIC, NITROUS acid. It moreover conveys a very miſtaken notion, long ſince exploded, concerning the nature of metallic oxides, and of calcareous earth.

CARBONATED CRUDE IRON, as uſed by Mr. Parkinſon, (ſecond edition, p. 86.) is an improper name for Steel. It ſtrictly means, if any thing preciſe, an oxide, prepared from crude

iron, and combined with carbonic acid. CARBURET OF IRON is the true methodical name for all combinations of carbon and iron; and is to be modified to expreſs the predominant ingredient by prefixing SUB or SUPER.

The ingenious Mr. Henry, of Manchester, in his "Epitome of Chemiſtry," page 118, has ARSENIAC ACID. This termination is againſt the rule, by which the ſtate of acids is pointed out, and therefore ſhould not be allowed. The Epitome of Chemiſtry is a book, which, from the reputation of the author, and its own merit, is likely to be in the hands of many; therefore I am induced to obſerve its minuteſt errors in the point of view I am now conſidering.

The Engliſh tranſlator of Gren's Chemiſtry propoſes to call metallic ſalts by the name of the metal, preceded by the paſſive participle of a verb,

formed

formed from the name of the acid radical, and terminated by the deſignation of its ſtate of combination with oxygen, as thus: SULPHATED, NITRATED, MURIATED, &c. OXIDE of iron, inſtead of SULPHATE, NITRATE, MURIATE of iron. This, in a certain ſenſe, is clear and accurate; but two reaſons may be given, why the latter denomination ſhould be allowed to remain.

1ſt. Sulphated is a term, happily applied by mineralogiſts to their ſcience. It is uſed by them to denote thoſe natural ſaline combinations, which we, in chemiſtry, denote by ATE. Thus MURIATED ſilver is, in mineralogy, the natural MURIATE OF ſilver; and MURIATE OF ſilver is the artificial ſubſtance, which, when found in nature, mineralogiſts term MURIATED ſilver. This part of the Abbé HAUY's nomenclature muſt be approved, as it forms a happy diſtinction between the kindred

ſciences; at the ſame time leaving a connection "qualis decet eſſe ſororum." I do not ſee ſufficient reaſon for infringing upon this mode of appellation.

2d. It is well known that no metal, unleſs it be combined with more or leſs oxygen, is ſoluble in the acids. This is a generic character of metallic ſalts. What is true of the genus, without a ſingle exception (and in this caſe there is none) is true of every ſpecies, and of every individual. It is, therefore, uſeleſs to repeat the ſtate of oxidizement before every one; and, as SULPHATE of iron is ſhorter, it is to be preferred to SULPHATED OXIDE OF iron. I would not, by this, be thought to plead indiſcriminately for conciſeneſs in expreſſion. We ſhall preſently ſee ſome examples where brevity is inadmiſſible. There is but one kind of ſentence or expreſſion truly ſhort; that which, while

while it employs few words, leaves no ſhadow of obſcurity or doubt; and SULPHATE OF IRON can ſtand every teſt on this head.

We frequently meet with ORATE, ARGENTATE OF AMMONIA, MANGANESIATE OF POTASH, &c. as if there really exiſted an ORIC, ARGENTIC, MANGANESIC ACID. The power of combining with alkalis is not alone a ſufficient character of an acid. If it were, we ſhould be forced to claſs among the ſalts, ſolutions of Silica, Alumina, Glucine, in Potaſh or Soda, and to rank ſimple earths among combuſtible bodies ſaturated with oxygen. Then we ſhould have SILICIC, ALUMINIC, GLUCINIC acid; and SILICATES, ALUMINATES (ſee above in this chapter), GLUCINATES of Potaſh and Soda. This ſingle example is ſufficient to prove how dangerous it is to ſwerve

from principles in the moſt trifling article.

The above inſtance fortunately follows the former, in which a conciſe expreſſion was preferred, merely on account of its brevity, to one equally good. To expreſs any of the combinations juſt mentioned, we muſt uſe a periphraſis. We cannot, without creating confuſion, infringe upon other claſſes of combinations for a name or termination. The ſyſtematic nomenclature has not foreſeen the caſe. SOLUTION OF SUCH A NEARTH, OF SUCH A METAL, IN SUCH AN ALKALI; or, if ſolid, COMBINATION is the proper expreſſion. The errors, into which chemical writers have fallen, from want of a definite appellation for this compound, are ſufficient proof of the neceſſity of leaving nothing vague and undetermined in the ſyſtem of chemical nomenclature. Some

general

general reflections on this head ſhall occupy a ſeparate chapter.

ANTIMONIATED TARTRITE OF POTASH is a faulty denomination. ANTIMONIATED, ANTIMONIATE OF, are ſynonyma, ſee above; and expreſs the ſalts of an ANTIMONIC acid, which does not exiſt. The French term is, TARTRITE ANTIMONIÉ de POTASSE. ANTIMONIÉ, accurately rendered, would be, in Engliſh, ANTIMONIED; but ANTIMONIAL is our uſual adjective. Therefore, ANTIMONIAL TARTRITE OF POTASH (of TARTRITE hereafter). Were this the proper place, I ſhould wiſh that the quality of being acidifiable had not been ſo liberally attributed to metals, which, in fact, poſſeſs but the ſingle acid property of combining with earths and alkalis.

Mr. Prouſt was wrong in giving the name of HYDRATE to that combination

of water with the Oxide of copper, which he diſcovered. HYDRATE implies HYDRIC ACID, which is abſurd.

HYDRO-OXIDE had been a much more proper appellation, as it would expreſs the combination not of Hydrogen, but of water; which is the truth.

AMMONIURET OF COPPER, OF COBALT, of NICKEL, &c. would ſeem to imply, that Ammonia is a ſimple combuſtible ſubſtance, and combined with any of theſe metals in their metallic ſtate. It is therefore evident, how faulty a denomination this muſt be; and how liable to miſlead thoſe, who are beginning the ſtudy of Chemiſtry. Yet this term is one of thoſe moſt frequently uſed, and which I have heard ſupported with the greateſt warmth.

ACID OF TARTAR, of SUGAR, of LEMONS, are faulty denominations, only as they do not expreſs all they ſhould. They are innocent in as much

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as, conveying no idea of their ſtate, they cannot be accuſed of propagating falſe principles. TARTAREOUS, (ſee hereafter) OXALIC, CITRIC, are the ſyſtematic terms.

TARTRITE OF SODA, as now applied, is a very improper expreſſion. ROCHELLE SALT (what is denoted by TARTRITE OF SODA) is a triple ſalt, formed by ſaturating the acid in Supertartrite of Potaſh by Carbonate of Soda. It is TARTRITE OF POTASH and of SODA.

The Chemiſt laſt mentioned talks of TANNATE OF IRON, OF TIN, &c. This is exceptionable on the ſame grounds as his HYDRATE OF COPPER.

TANNURET OF GELATINE is a name, which I have heard propoſed to denote leather. But TANNURET, by its termination, ſignifies a ſimple combuſtible body in combination, and cannot be admitted.

Sometimes, in the vegetable and animal kingdoms, the names of ſubſtances, which Fourcroy denominates the "*Matériaux immédiats*," are combined in oppoſition to all principles. But it would be too tedious to enter into particulars upon ſuch minute points. Enough has been ſaid already upon this part of the ſubject. It is not difficult to correct ſuch miſtakes; and the nature of the ſubſtances ſhould, in point of nomenclature, be as much the ſtandard, to which the Chemiſt refers, as the queſtion, Who or What, is the guide of the Grammarian.

It may be expected that I ſhould offer ſome remarks on the terms PHOSOXYGEN, PHOSMURIATE, MURIATIC PHOSACID, ORIC, ARGENTIC PHOSOXIDE, as they are to be found in Mr. Davy's Reſearches. But I am happy to hear, that this ingenious chemiſt has renounced both his theory and his names. It is therefore

ſufficient

ſufficient to point out the impropriety of the latter in general terms.

The THERMOXYGEN, ELECTRIC ACID, ELECTRATES, &c. of Brugnatelli muſt be ranked in the ſame claſs of wild unfounded nomenclature.

In the Syllabus to Mr. Davy's Lectures, delivered at the Royal Inſtitution, there are a few miſtakes of nomenclature. But, as they have been noticed under different heads, I ſhall not repeat them.

I have had occaſion, twice in this chapter, to mention a very uſeful work, which cannot be too generally referred to, as one of the moſt judicious compendia to be found in any ſcience, Mr. Parkinſon's Chemical Pocket-Book. The Author has ſhown, by the arrangement and conduct of his work, how truly he appreciates the valuable qualities of method and order. The faulty expreſſions, which I have mentioned,

muſt

muſt be the reſult of his having made the ſcience, rather than its nomenclature, his particular ſtudy. In caſe I ſhould again have occaſion to make ſimilar remarks upon Mr. Parkinſon's work, I think it neceſſary to premiſe that it is, becauſe I would recommend it, before all others, to the peruſal of ſtudents, that I am particularly ſevere upon a compilation, conducted, in all other reſpects, with ſo much taſte and judgment.

CHAPTER IV.

OBSERVATIONS UPON SUCH TERMS IN OUR LANGUAGE, AS DO NOT SEEM TO BE THE MOST APPOSITE TO RENDER THE FRENCH EXPRESSION.

IT was a peculiar object with the French Neologiſts to conſtruct ſuch expreſſions, as might, with eaſy changes, be received by every nation, where literature flouriſhes, or the ſciences are cultivated. It was intended to be a univerſal language, which ſhould not require to be tranſlated, but merely modified according to the radical idiom and pronunciation of all, that ſhould adopt it. The Germans ſoon deviated from this intention; they formed for them-

themſelves a language, ſimilar indeed in principle, but bearing no reſemblance in the individual expreſſions. This was a much greater impropriety than any, that we have been guilty of; for it broke the bond of union, which would, it was hoped, notwithſtanding the diverſity of language, have, in ſome meaſure, brought together the ſcientific perſons of every country. But it muſt be confeſſed, that the new chemical ſyſtematic nomenclature has, in its original garb, certain advantages, which we have not been able to preſerve.

The French and Engliſh languages have each an orthoepy peculiar to itſelf; and where the differential qualities of ſubſtances are to be marked by a letter or a ſyllable, it is eſſential, that the word be conſtructed in ſuch a manner, that the diſcriminating letter, or the diſcriminating ſyllable be the prominent feature of that word. This principle

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the French have obſerved; but ſo much does our language differ from theirs, that we cannot, without offending its radical pronunciation, enjoy the ſame advantage. They lay the accent generally upon the latter ſyllables; and their natural manner of ſpeaking ſufficiently marks the diſtinction between NITRIQUE and NITRÉUX, NITRATE and NITRÍTE. On the other hand, we cannot ſo well render thoſe delicate modifications of ſound ſenſible to the ear, without forcing the accent from its uſual ſituation. For, in the common courſe of ſpeaking, we ſhould pronounce NÍTRIC, NÍTROUS, NÍTRATE, NÍTRITE. This unavoidable imperfection muſt leave the nomenclature, in our language, inferior to its original; for the advantages we ſhould reap, by ſtriking at the root of the evil, would not compenſate the greater merit, ariſ-

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ing from the facility of univerſal communication.

It is not to ſuch remarks as theſe, that we muſt turn our attention, when we would examine the ſyſtem of chemical nomenclature, propoſed by one of the moſt diſtinguiſhed chemiſts of this country; and one of the perſons moſt capable of forming ſuch a language. It has been generally followed, except in caſes ſuch as thoſe which I pointed out, in the laſt chapter; and an obſervance of the excellencies it contains cannot be too much recommended. But if we apply to it the great teſt of principle, we ſhall be able to perceive ſome little anomalies, which I ſhall endeavour to point out; and ſhall think myſelf particularly fortunate, if my efforts are attended with any part of the ſucceſs, with which Dr. Pearſon has repelled the attacks, made againſt the

benefits

benefits of ſyſtematic nomenclature by a very ingenious antagoniſt.

That the French Nomenclature is not perfect in all its parts, has never been denied, either by thoſe, who originally propoſed, or by thoſe, who ſince that time have moſt ſtrenuouſly defended it. In the following chapter, we ſhall become more fully acquainted with the principal objections, to which it is liable. In the preſent, we ſhall obſerve ſuch faults only as are not to be found in the original; or, if found, exiſt under another form.

Dr. Pearſon propoſes to ſubſtitute the term CALORIFIC to CALORIC, CALORIQUE of the French. He likewiſe mentions, in his diſſertation, and inſerts, in his table, the word GASOGEN, propoſed by Gadolin, to ſignify the ſame thing. CALORIC is certainly not a term altogether unobjectionable, and CALORIFIC expreſſes the idea much better;

better; and that, as Dr. Pearſon very juſtly obſerves, without abſolutely offending the principles of Nomenclature. In diſcuſſing the merits of the French original, I ſhall more fully conſider the expreſſions, uſed to denote the latent heat of the Antients.

GASOGEN is to be cenſured, in as much as it denotes a property of heat, which is not ſufficiently characteriſtic. It is very true, that a quantity of heat, applied to bodies, will ſooner or later, in proportion to their reſpective capacities for heat, convert the greater number of them into gas, and remain with them in a ſtate of chemical combination. But,

In the firſt place, the abſence of preſſure has great influence on the gaſogenerical property of heat.

2d. Gaſogeneity is not the moſt diſtinguiſhing property of heat; for there is a conſiderable quantity of heat

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in liquids, and a conſiderable quantity in ſolids. Nay, can we conceive a ſubſtance to exiſt without heat? Let us for a moment ſuppoſe a body, reduced to a degree of temperature, the utmoſt the imagination can attain. Who will aſſert, that there is not yet, in combination with this body, an immenſe proportion of heat? Do we know enough (indeed do we know any thing more than a few ſcattered facts?) to ſay, that there can be a total privation of it? If we cannot ſupport this aſſertion, how ſecondary a property of heat will gaſogeneity appear? For what is the proportion of matter in the ſtate of gaſeous fluid, compared to the real ſum of the liquid and the ſolid? The oceans, that ſurround our continents, and the rivers, that flow through them, outweigh perhaps the united atmoſpheres of our whole ſyſtem; and the ſolid content of the globe, which we inhabit, might, in

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the gaſeous ſtate, furniſh wherewith to encompaſs millions of planets ſuch as ours. And is it becauſe, in our laboratories, we can, by the application of heat in a furnace, make bodies paſs through various ſtages, till they end in gaſeity, that we give a name to a ſubſtance, which modifies the univerſe?

In the ſixth column of Dr. Pearſon's Tables, we find this ſeries of combinations of combuſtible bodies:

Carburets or Carbures
Carbureta
Hydro-carbonate gas.
Compounded of Carbon and Metals, &c.

Sulphurets or Sulphures
Sulphureta
Conſiſt of Sulphur and Metals, earthy, alkaline, or other baſes.
Sulphurated Hydrogen Gas

Gas

Gas Hydrogenium Sulphuratum
Sulphurets, containing Carbon, Metals, &c.
Sulphuretum Carbonico Connuptum &c.

Phoſphorets or Phoſphures.
Phoſphoreta
Combinations of Phoſphorus, with different baſes.
Phoſphoriſed Hydrogen Gas.
Azotic Carbonic Acid, &c.
Gas Hydrogenium Phoſphoriſatum.

Here we have a ſeries of bodies, belonging to the ſame genus, viz Combinations of combuſtible bodies one with the other. The firſt fault is the unneceſſary converſion of U into O in PHOSPHORETS. This change originated in the O of the penultimate of Phoſphorus. But PHOSPHURET is a contraction

traction of PHOSPHOR-URET; as CARBURET, of CARBON URET. However, as it may in ſome meaſure be traced to the original, we ſhall reſerve ſpeaking of it till the next chapter.

HYDRO-CARBONATE GAS (ſometimes called ſimply HYDRO-CARBONATE) is of much more ſerious conſequence. CARBONATE is the generic name for ſalts, compoſed of CARBONIC ACID, and a baſis. HYDRO implies a combination of water, as has been already ſtated for HYDRO-OXIDE, or HYDROXIDE. Therefore a HYDRO-CARBONATE means a carbonate combined with water. But HYDROCARBONATE of what? The ſentence is left incomplete in this ſenſe; for the term, which, in fact, denotes a genus of ſalts compoſed as before ſaid, is applied to a combination of Hydrogen gas and carbon.

This fundamental error being adopt-

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ed in the firſt ſpecies, we might expect to ſee it propagated throughout. But in the next, we ſee SULPHURATED HYDROGEN, and not HYDRO-SULPHURATE GAS. This is the more extraordinary, as, in the Diſſertation, page 7, Dr. Pearſon gives this ſubſtance a very proper denomination in SULPHURET OF HYDROGEN GAS. In page 56, he has again written SULPHURET OF HYDROGEN GAS, and adds, or SULPHURATED HYDROGEN GAS, thus deriving, as it were, SULPHURATED from SULPHURET. There was, however, a more natural participial adjective, and one that would have been much more proper. But I muſt not anticipate any part of another Chapter.

To avoid uniformity, the third ſpecies receives the name of PHOSPHORIZED HYDROGEN GAS. Every one of theſe names is reprehenſible; and I

ſhall, in the proper place, propoſe a method of correcting them.

In the ſame encloſure with PHOSPHORIZED HYDROGEN GAS, we find, AZOTIC CARBONIC ACID. This, beſides being unmethodically placed in this genus, devoted to the combination of ſimple combuſtible bodies one with the other, and without the intervention of Oxygen, is a faulty denomination. There is no combination in this caſe, but ſimply a mixture of Azote and Carbonic Acid. To give a name to every mixture, as if it were a compound, would be unphiloſophical; and would involve Nomenclature in endleſs perplexities.

In the third column, we find the combinations of Azote with Oxygen, thus denominated, according to their different ſtages of Oxygenizement. OXIDE OF NITROGEN, NITROUS OXIDE, NITROUS ACID. NITRIC ACID. And,

in

in the fourth column, GAZEOUS OXIDE OF AZOTE. NITROUS OXIDE GAS. NITROUS ACID GAS. NITRIC ACID GAS. OXY-NITRIC GAS. To all intents and purpoſes, if faith can be placed in Nomenclature, OXIDE OF NITROGEN and NITROUS OXIDE are one and the ſame thing; better denominated however, as ſhall preſently be ſhown, by the former name. GAZEOUS OXIDE of AZOTE and NITROUS OXIDE are in the ſame predicament. But the original not being very preciſe as to theſe ſubſtances, the diſcuſſion of them will be better deferred for the preſent. It will be proper however to remark here, with regard to OXYNITRIC GAS, that it is ſuperfluous to give names to bodies, which have no exiſtence in reality.

The names which, in the ſame tables, we find given to the Alkalis, are altogether founded upon error. It will be needleſs to diſcuſs the merits of the

contractions, which have been propoſed of VEGETABLE ALKALI, FOSSIL ALKALI, and VOLATILE ALKALI. Such as VEGALKALI, FOSSALKALI, VOLALKALI, or VEGKALI, FOSSKALI, VOLKALI, when we ſee that the very roots, from which they ſpring, ſhould be torn up.

Dr. Pearſon very juſtly remarks the impropriety of the term KALI, applied to that very Alkali, which is not contained in the aſhes of the plant *kali ſpinoſum*. In ſo doing, he has ſhown a laudable deſire to adhere to the baſis of all method and order; to principle. However, in applying the rules of nomenclature, in the next inſtance, he ſwerves from the precepts he had but juſt inculcated.

VEGALKALI, a contraction, as we before obſerved, of VEGETABLE ALKALI, ſuppoſes that this Alkali is found excluſively, or nearly ſo, in the vegeta-

ble

ble kingdom. FOSSALKALI implies, that the one ſo called is confined to the mineral kingdom. But Dr. Pearſon has himſelf told us, whence the ſubſtance, called Foſſalkali, is extracted. Therefore, although this Alkali be not found in ſo great a number of vegetable productions, yet it is the vegetable kingdom, which excluſively furniſhes it for conſumption. For, although Muriate of Soda and Sulphate of Soda, ſtrictly ſpeaking, be not products of vegetable organization, they are not more properly called mineral productions, than Sulphate or Muriate of Potaſh. Both theſe Alkalis are, in the common courſe of operations, extracted, either from the aſhes of a burnt vegetable, or from ſalts found in natural ſprings or fountains. If one be properly vegetable Alkali, the other muſt be ſo too: and if we turn towards the mineral kingdom, properly ſo call-

ed, and endeavour to ſupport theſe denominations by looking at reſults, taken from obſervations therein, we ſhall find, that, of the two, Potaſh is found the more frequently, and in the greater quantity, as a component part of the moſt mineral (if I may be allowed the expreſſion) of all ſubſtances, of hard and heavy ſtones. To prove this aſſertion, I appeal to the writings of ſuch of our ableſt analyſts, as have found either of theſe Alkalis in ſimilar combination; to Mr. Klaproth on the one hand, and to Dr. Kennedy on the other. I think that the two firſt terms, propoſed by Dr. Pearſon, cannot be defended upon any grounds.

Having, in the laſt chapter, obſerved the impropriety of calling POTASH and SODA, FIXED ALKALI, I muſt refer the reader to it, in order to avoid repetition upon the name VOLALKALI, or VOLATILE as applied to this ſubſtance.

No.

No. LVIII. of the firſt column contains LIME, QUICK LIME. Any epithet to a pure ſubſtance is uſeleſs. I do not ſee why a preference ſhould be given to BARYT, to the prejudice of BARYTES.

AMMONIAC is a term, which Mrs. Fulhame, in the preface to her ingenious work, has expreſſed a deſire to ſee changed. I agree with her in preferring AMMONIA, were it for no other reaſon than to diſtinguiſh it more fully from the gum, generally ſold under the name of GUM AMMONIAC.

The next term, which is worthy of remark, is one, adopted by Dr. Pearſon, upon the propoſal of Mr. Kirwan. To combat the opinion of ſuch a junction is hazardous; and may be counted raſh. But as I am not the champion of my own opinions, but the aſſertor of principles, if they combat on my ſide,

I ſhall have no reaſon to decline the conteſt.

OXYMURIATIC ACID was propoſed by the celebrated Preſident of the Royal Iriſh Academy, as a ſhorter term than OXYGENATED MURIATIC ACID. It is remarked in the preceding chapter, that the only expreſſion, which can, with propriety, be called ſhort, is that which, while it employs few words, leaves no ſhadow of obſcurity or doubt.

OXYGENATED MURIATIC ACID (ſee Chapter VII.) ſufficiently implies the union of a more than the common portion of Oxygen to that acid. But if the etymology of the term OXYGEN be really underſtood, OXYMURIATIC ACID muſt mean ACID MURIATIC ACID; and OXYMURIATE OF POTASH, as it is very frequently termed, ACID MURIATE; or, to follow the rule for other ſalts, SUPERMURIATE OF POT-

ASH.

ASH. To judge this expreſſion by the ſtandard of rule, we muſt condemn it, as one, which a moment's reflexion will ſhow to be very capable of miſleading minds, acquainted only with the firſt principles of the ſcience.

OXYSULPHURIC ACID is to be rejected at once, ſince no ſuch thing exiſts. If, after what Mr. Vauquelin has publiſhed on this ſubject, in anſwer to the Memoir of Mr. Giobert, any thing which I might ſay could be worth attention, I would add, that I have repeated moſt of Mr. Giobert's experiments, and have not found them to be accurate.

FLUOR ACID GAS (column fourth) to be methodical, ſhould have the termination IC added to FLUOR.

We find, in the firſt column, and among the metals, the ſame terminations in ITE, which were noticed in the preceding chapter. To it, there-

fore, the reader is referred for particulars.

Although, in the Tables, Dr. Pearſon calls the Metallic Acids, TUNGSTIC, MOLYBDIC and CHROMIC ACIDS, in other parts of his work upon Chemical Nomenclature, we find CHROMITIC, MOLYBDENIC, TUNGSTENIC Acids. Theſe are more ſtrictly according to rule, than the names generally in uſe. But, abbreviations have been introduced, and perhaps there is no very poſitive reaſon, why they may not be tolerated. However, it would avoid confuſion, could general rules be laid down for the formation of the terms, which muſt be derived from the radical word. In French, SOUFRE gives SULFURIQUE, SULFATE. The regular formation would have been to derive the name of the compounds immediately from the radical, inſtead of the Latin *Sulphur*, and to have ſaid SOUFRE,

SOU-

SOUFREUX, SOUFRIQUE, SOUFRITE, SOUFRATE. At firſt, it might have ſounded uncouth, but the ear ſoon becomes accuſtomed even to much harſher ſounds. Indeed to a perſon, who had never heard either, SOUFRIQUE would not be much more ſo than SULPHURIQUE. The derivation of SULFATE from SULFURIQUE is not regular, as NITRATE from NITRIQUE. SULPHURATE would be the proper term; but UR has been omitted, as it is ſaid, for the ſake of euphony. If SULFURATE had been adopted by the French, our term, SULPHURATED Hydrogen, could never have exiſted.

In the column, which has for its title, "Oxides with different Baſes," and the firſt encloſure, we find ARSENICAL OXIDE OF VEGALKALI. To judge of this ſubſtance according to the rules, I ſhould ſuppoſe it to be an OXIDE OF POTASH, formed by the means

of Arſenic. Among the old names, and oppoſite to it, is put LIVER OF ARSENIC. Therefore the name, according to Dr. Pearſon's tranſlation of the French Nomenclature, is SULPHURATED*, or HYDRO-SULPHURATED OXIDE OF ARSENIC. ALKALINE OXIDE OF MANGANESE means an OXIDE OF MANGANESE PRODUCED BY AN ALKALI, as we ſay, NITRIC OXIDE OF ANTIMONY, OF TIN, &c. ALKALINE COBALTIC OXIDE is equally reprehenſible; and alſo AMMONIACAL OXIDE OF COPPER. SOLUTIONS OF THESE METALS IN SUCH OR SUCH AN ALKALI is, as was before mentioned, the proper method of deſcribing thoſe combinations. SACCHOLATE for SACCHOLACTATE, or SACLACTATE, is not regularly derived from SACCHOLACTIC or SACCLAC-

* See chap. 7.

TIC

TIC ACID. Dr. St. John has adopted the ſame denomination.

I have pointed out, pretty freely, ſuch objections to the Syſtem of Nomenclature, propoſed by Dr. Pearſon, as appeared to me to be cauſed by a non-obſervance of rule. I may have appeared, in ſome inſtances, too minute and hypercritical. But let it be remembered, that a ſcientific ſyſtem is not a matter of taſte, where there may be a difference of opinion; but a ſeries, derived from principles: and whatever ſwerves from them, however ſmall the deviation, is reprehenſible, in proportion to its remoteneſs from that ſtandard. If a few errors have eſcaped my notice, a thorough knowledge of the principles will enable every perſon to rectify them for himſelf.

CHAPTER V.

OBSERVATIONS UPON CERTAIN DENOMINATIONS, WHICH, IN THE ORIGINAL, ARE NOT CONFORMABLE TO THE PRINCIPLES OF THE SYSTEM.

AT the time when the chemiſts, who formed the French Nomenclature, made their ſyſtem known to the world, they had ſtill to combat the opinions and prejudices of many philoſophers. Some, who were educated, and had acquired reputation in propagating the doctrines of Stahl, found it difficult to renounce his tenets. And others could not patiently behold the ſtudents of the Lavoiſierian theory rapidly attaining the heights of ſcience, which it had taken

them

them much longer time to aſcend. A certain degree of regard to their feelings is ſtill to be perceived through the works of Meſſrs. Lavoiſier, Berthollet, Fourcroy, and Guyton, who certainly would not otherwiſe have ſuffered ſome of the denominations to remain. Pity it is that ſo good a work ſhould bear any marks of prejudice; and ſurely now, that the theory is ſo well eſtabliſhed, it ſhould not, from ſuch a cauſe, be ſuffered to languiſh in one of its eſſential parts.

The ſecond denomination, which we ſee in the French Table of Chemical Nomenclature, is HEAT, concerning whoſe combinations, as well as concerning itſelf, we yet have much, or, to ſpeak more properly, every thing to learn. We are however tolerably certain, that it does exiſt in different bodies, in combination; and that, during this quieſcent ſtate, it is not perceptible

ceptible to any of our organs. At the moment of its liberation, it does become a ſenſible object; and, to Heat, in this ſtate, has the name been given. The vulgar idea, connected with this word, renders it unfit to expreſs that mode of exiſtence, perceptible only by chemical organs. To avoid confuſion, the French propoſed to ſubſtitute CALORIQUE, CALORIC, in the room of HEAT; or, as they ſometimes ſaid, LATENT HEAT. This term is, in fact, as Dr. Pearſon has remarked, the ſame word in another language; but CALOR being remote from common uſe, the ſame idea is not connected with the term. Fearing however, that, ſtrictly ſpeaking, the reverſe ſhould be the caſe, Dr. Pearſon judiciouſly propoſed to remove all amphibology, and ſubſtitute the cauſe of the ſenſation of heat, the cauſe of calor, CALORIFIC. This alteration is truly philoſophical, and ſatisfactory; in as far

as

as relates to the idea it conveys. But it had perhaps been better, if the Doctor had formed a word from that language, from which the greateſt part of the chemical terms have been derived.

We have the generator of acids, of water, OXYGEN and HYDROGEN; why ſhould we not have the generator of heat, THERMOGEN? It certainly would have preſerved uniformity, ſo much to be deſired in every ſyſtematic work; and in him it would not have been a great ſtretch of prerogative, to have propoſed it. But be that as it may, although I have endeavoured to call back many words, that had wandered from the ſtandard of rule, it is my intention to avoid all that might lead to innovation.

The term immediately preceding is ſubject to the ſame obſervations. LIGHT, in common language, is expreſſive of a different idea from the COMBINED

LIGHT (if ſuch there be) of the Chemiſts; and bears the ſame relation to it, that the COMMON HEAT does to COMBINED HEAT. PHOTOGEN is a term, which might have been propoſed upon the ſame principles as the former word.

It is not very eaſy to ſee upon what principle the term AZOTE has been propoſed to expreſs the ſimple ſubſtance; while its Oxides and its Acid have received names totally different from the radical. This is a groſs violation of rule, and has often been remarked before. Either the Oxides and Acid ſhould have been called OXIDES OF AZOTE, and AZOTIC ACID; or the baſis ſhould have received its name from its compounds. The former had been the more regular method, although the latter has been more generally adopted. Chaptal was the firſt who propoſed the term NITROGEN to ſignify AZOTE;

and

and we have now many derivatives from that ſource.

That Nitrogen ſhould enter as a component part into Ammonia, is no more an argument againſt its bearing the name of NITROGEN, than to ſay, that, becauſe Hydrogen is a component part of Hydro-ſulphuret, it cannot bear the name of generator of water. The moſt ſtriking property of Nitrogen is to form nitric acid, as that of Hydrogen is to form water. For, notwithſtanding the aſſertion of ſome Chemiſts, that Azote is a component part of all the Alkalis, its preſence never has been proved in any but the one. ALKALIGEN therefore cannot be adopted as the proper name of this ſubſtance.

Nothing is more common than to find Chemiſts contending about their priority of claim to the aſſertion, that Potaſh is a compound of lime and azote; and Soda a compound of magneſia and azote.

azote. But bare aſſertions, without proof, deſerve as much credit, and are entitled to as much praiſe, as theories without facts. Nothing is leſs difficult than to affirm; and a conjecture, which bears a ſhow of plauſibility, is a ſafe and eaſy method of acquiring a reputation of ſagacity. When an author hazards ſome aſſertion of this nature, even though it never be proved, ſtill it *may* be true; and in expectation of that proof, he enjoys the fame of ingenuity. If it be diſproved, neither his veracity, nor his reputed ſkill, incurs any riſk; for he has made nothing more than a conjecture. And, if chance ſhould ſtand his friend in directing his choice to ſome aſſertion, which at laſt is found to be true, he blaſts by a word all the glory, which ſhould belong to the real diſcoverer, the perſon who aſſerts upon conviction. The Alkalis, except the

one,

one, cannot at this moment be conſidered as compound bodies; or, if they can, then do I maintain, that every thing is compound in nature. It is not aſſertion, that can reſolve a compound into its elements. This muſt be done by experiment, if it can be done at all. Thoſe who have aſſured us, that Potaſh and Soda are compound bodies, have done ſo unphiloſophically and diſingenuouſly; and, if ever they ſhould be proved to be compoſed of lime or magneſia with azote, it is hoped that the ſcientific world will totally diſregard any actual claimants; and detract no ſhare of the praiſe from him who may be fortunate enough to become the real proprietor of the diſcovery. Muriatic Acid is in the ſame predicament. It is as much proved, that hydrogen is its baſis, as that azote is a part of Potaſh, or of Soda. When ſuch unfounded aſſertions come from ignorant pretenders,

they

they fall unnoticed. But every true friend of ſcience muſt grieve to ſee them attached to the names of men, who do not want, and ſhould be above ſuch unworthy attempts to enſnare fame. The ingenuous and candid philoſopher refuſes to meet them on ſuch grounds as thoſe. I hope this digreſſion will be pardoned, as it is my wiſh merely to vindicate the rights of the fair dealer in ſcience, againſt the ſubterfuges of the foreſtaller and monopoliſt.

The compounds of Azote have, ſince the formation of the New Nomenclature, been found more numerous than was then imagined. To that, which has been laſt diſcovered, the name of GAZEOUS OXIDE OF AZOTE has been given; and has ſince been changed by Mr. Davy to NITROUS OXIDE. Either of theſe names may be wrong, or may be right, according to the point, from which we are ſuppoſed

to

to depart, as the principle of denomination in the ſimple ſubſtance. If AZOTE be the radical, it was altogether uſeleſs to propoſe any alteration. But if NITROGEN be the name of the ſimple ſubſtance, I agree with Mr. Davy, with regard to the principle, upon which he called it NITROUS OXIDE. The next degree of Oxidizement of this ſubſtance, previous to acidification, is the compound, called NITROUS GAS. But what degree of Oxygenizement is marked, or what difference (except that the one is called GASEOUS, and that the other may be in any ſtate,) is announced by ſuch appellations, I am at a loſs to conjecture. GAZEOUS OXIDE OF AZOTE and NITROUS GAS appear to me, as I before obſerved, to mean, according to the principles of Nomenclature, one and the ſame thing, but they are, in fact, very diſſimilar; and ſhould be as diſtinguiſhed from each other, in

name,

name, as they are different in nature. The French Nomenclature has made no proviſion for caſes of this kind; but this belongs more particularly to the following chapter.

Some better names than POTASH and SODA, might ſurely have been found to denote thoſe Alkalis. The words POTASH and SODA have, in common uſe, been applied to ſo many different ſubſtances, from vegetable cinders, nay from plants *(Salſola Soda)*, to the pure Alkalis, that we cannot diveſt philoſophic language altogether of the influence of vulgar idiom in theſe terms.

The next denomination, worthy of notice, is that applied to the combinations of ſimple combuſtible bodies one with the other. I have already mentioned thoſe, adopted by Dr. Pearſon; and have ſhown, how far they were defective. It is but juſtice now to ſay,

that

that the ſource of this defect may be traced in the original. GAS HYDROGÈNE CARBONÉ, HYDRO-CARBONATE; GAS HYDROGÈNE SULFURÉ, SULPHURATED HYDROGEN; GAS HYDROGÈNE PHOSPHORÉ, PHOSPHORIZED HYDROGEN.

The firſt of theſe terms is improper, and, no doubt, defaces the order and regularity it was intended they ſhould produce. By the fourth rule, Chap. II. it has been eſtabliſhed that URET in Engliſh, (URE in French,) ſhould be the termination of all combinations of the preſent order. The adjective to be formed from this termination is eaſily conceived, according to the genius of each language; and, in French, is applied to one of theſe bodies: as, GAS HYDROGÈNE SULFURÉ. The combinations of Carbone, with other combuſtible bodies, are called CARBURES, CARBURETS: as CARBURE DE FER,

CARBURET OF IRON; or, in Mineralogy, FER CARBURÉ. CARBURÉ is therefore the proper Adjective; and, in ſtrict propriety, we ought to ſay, CARBURE D'HYDROGÈNE*. GAS HYDRO-

* Mr. Berthollet in a late publication has uſed GAS HYDROGENE OXYCARBONÉ. I imagine that this term means CARBURETTED HYDROGEN GAS, and that OXY implies that the Carbone enters into combination with combuſtible bodies in the ſtate of Charcoal, or Oxide; not in the ſtate of Diamond, or radical Carbone. This is by no means proved. Nay the experiments of Sir George Mackenzie (Edinburgh Tranſactions) demonſtrate, that Steel is a combination of Iron and Carbone, not Oxide of Carbone. It is probable alſo, from their colour, that vegetables contain Carbone, not Oxide of Carbone. The ingenious theory, which Mr. Berthollet has publiſhed in his "Elémens de l'Art de la Teinture," will now be ſubject to ſome modification. He there ſays, that the colour of vegetable bodies paſſes to brown from white, as the Hydrogen is deſtroyed by the contact of the air; and the Charcoal becomes predominant. This may

HYDROGÈNE CARBURÉ. CARBURET OF HYDROGEN, CARBURETTED HYDROGEN GAS; and not CARBONATED HYDROGEN, or ſtill worſe, HYDRO-CARBONATE. In like manner, SULPHURET OF IRON, SULPHURET OF HYDROGEN, SULPHURETTED HYDROGEN GAS. This is the participial Adjective, to which I alluded in the laſt chapter, when I lamented, that the true word had eſcaped Dr. Pearſon; and that inſtead of deriving SULPHURETTED from SULPHURET, he had written SULPHURATED HYDROGEN.

GAS HYDROGÈNE PHOSPHORÉ is reprehenſible, inaſmuch as the O inſtead of the U is not according to rule. This remark may be thought hypercritical and nugatory. No doubt it would be

may be the caſe, and is moſt likely: But I think that the converſion of Carbone into Charcoal has its ſhare of cauſation on this change of colour.

ſo, were it not applied with an intention to point out an unprofitable violation of Rule. The original word is PHOSPHORE, PHOSPHORUS; and thence it appeared natural to ſay, GAS HYDROGÈNE PHOSPHORÉ; but PHOSPHORÉ ought to be conſidered as a contraction of PHOSPHORURET; as CARBURE, a contraction of CARBONURET, and the word ſhould be written with a U: PHOSPHURÉ, PHOSPHURET, PHOSPHURET OF HYDROGEN, PHOSPHURETTED HYDROGEN. Theſe obſervations, in the ſpelling of a word, may ſeem to anticipate another chapter of this Eſſay. But it is not an arbitrary adoption of one mode of Orthography, in preference to another, upon which I now animadvert. It is the eſſential and diſtinguiſhing feature of the word, which I wiſh to maintain, ſince it is eſſentially connected with the principles,

ciples, which I am endeavouring to ſupport.

HYDRO-SULPHURET (HYDRO-SULFURE) is another term, which offers opportunity for a few reflexions. I have ſtated before, that HYDRO-OXIDE, or HYDROXIDE, would be the proper term for all combinations of metallic Oxides with water; for ſuch combinations, as Copper, Cobalt, Nickel, and Uranium are capable of affording. But, if HYDRO be uſed to expreſs the preſence of water as a component part, it cannot be admitted to denote the ſame thing, with regard to HYDROGEN. Some other term muſt therefore be introduced; and HYDROGENATED has been often uſed for that purpoſe. But it is really eſſential to avoid, in all other branches of what may be called the technical language of this ſcience, ſuch terminations as are appropriated to diſtinguiſh the

different genera and ſpecies of compound bodies. There is no ſolid objection to HYDROGENIZED, for it is full as congenial to our language. It would prevent much obſcurity ariſing from amphibology; and would give chemical language a greater appearance of belonging to a truly philoſophical ſyſtem. HYDROGENIZED SULPHURET OF POTASH, of SODA, &c. is therefore the term, by which, in reference to chemical principles, I propoſe to denote what we uſually call HYDROSULPHURETS. I am fully aware, that it may be a little longer, in reſpect of the number of letters, but it will be found much ſhorter, in as far as it avoids all confuſion, with regard to the ſtate of combination of HYDROXIDE and HYDROSULPHURET.

The obſervations I had made, in ſpeaking of the appellation, propoſed by the Engliſh Tranſlator of Gren's Chemiſtry,

miſtry, require to be further developed in this place. It was there ſaid, that it was uſeleſs to repeat, before each ſpecies, what was given as the generic character of metallic ſalts; and therefore the word OXIDE might be omitted.

But, with regard to the combination of Sulphur, it is quite different. That combuſtible body unites, as far as our knowledge reaches, with metals in their different ſtates; and the intervention of Oxygen is not a neceſſary bond of union. We have a real SULPHURET OF ANTIMONY in the crude Antimony; and in many ores, Sulphur is ſuppoſed to be combined without the preſence of Oxygen. On the other hand, it is ſaid, that in the Kermes and golden Sulphur of Antimony, there is a conſiderable quantity of Oxygen, firſt combined with the metal; and that, to this Oxide of Antimony, is further joined a combina-

tion of Hydrogen and Sulphur, the whole forming what deſerves the name of HYDROGENIZED SULPHURET OF, or SULPHURETTED OXIDE OF, ANTIMONY.

In paſſing next to the Vegetable Acids, we ſhall find there is, in many caſes, ſo manifeſt a deviation from all principle, that we cannot but wonder how ſome of the names came to be adopted. With regard to the radical, little can be ſaid, only that, as they are the ſame throughout the vegetable kingdom, it would be impoſſible to find a ſyſtem of terms, which could clearly expreſs them all. The name therefore has been taken from the ſubſtance, in which the acid firſt was found; or from which it is now moſt commonly extracted. The radicals have been well treated by Dr. Pearſon, in his work upon Chemical Nomenclature; and the proper ſyſtem,

by

by which they ought to be denominated, if brought at all to rule, has been clearly laid down. This conſideration is ſufficient to prove, how defective any attempt muſt be to follow the ſame principles among the vegetable acids, as in the mineral kingdom. We have been told of the Acid PYROMUQUEUX, the Acid PYROLIGNEUX, and the Acid PYROTARTAREUX; but fortunately, there is no need of theſe names, as the ſubſtances they denote have been proved not to be acids of peculiar genera. But the TARTAREOUS Acid and the TARTRITES do exiſt; and the reaſon, given for ſuch terms, is, that tartareous acid, when diſtilled, yields a ſtrong empyreumatic acid. It is certain, that all ſubſtances, when they are no longer themſelves, muſt become ſome other. Therefore the ſame reaſon may help us out in all caſes of miſnomer. But it is not

with what a ſubſtance may become, but what it is, at the moment we contemplate it, that we have to occupy ourſelves; and there is no reaſon, why TARTAREOUS ſhould be taken out of the uſual order, to become a privileged Acid. Its baſis is the ſame in nature, whatever it may be in mode and quality, with Oxalic, Citric, and Acetic Acids; and is not, by any means, deficient in Oxygen, to authorize the termination in OUS. ACETIC and ACETOUS Acids are denominations in direct oppoſition to all rule. Sulphuric and Sulphureous Acids differ in their proportion of Oxygen, and are legitimately diſtinguiſhed according to principle. But Acetic and Acetous, as the lateſt experiments inform us, do not differ in the proportion of the Acidifier, but in the very nature of their binary baſes. For, in all operations by which Acetous

becomes

becomes Acetic Acid, Chemiſts tell us that Carbone is left behind; and, in fact then, Acetic Acid is Acetous Acid, minus a quantity of Carbone. They are therefore, if they really do differ, as different as any two vegetable acids; and the ſimilarity of ſmell is a mere accident, which alone cannot authorize ſuch conſanguineous appellations. But, in fine, if we admit any ſuch diſtinctive terminations among the Vegetable Acids, there is no reaſon why we ſhould ſtop at all; and we ſhall then have eighteen or twenty new terminations to be formed, in order to expreſs, according to principle, a ſeries of ſubſtances, about which we are in great ignorance. The ſimpleſt and moſt philoſophical method appears to be, to exclude all ſuch diſtinctions from Vegetable Acids; fairly to acknowledge them, as yet, too little underſtood, to be embraced in the

general ſyſtem; and to give to every one of them the termination, which denotes a quantity of Oxygen, in ſuch a ſtate, as to amount to ſaturation.

The errors of the French Nomenclature are not confined to the denominations in their own language. One or two might be found in the Latin terms they have adopted. Among the metals, for inſtance, we find MANGANESE tranſlated into Latin by MAGNESIUM: the old word for this ſubſtance. But why, in a profeſſedly reformed Nomenclature, MANGANESE ſhould be ſo rendered, does not appear very evident. It is ſtill more faulty to allow an opportunity of confounding it with MAGNESIA; and retains a little of the influence of that language, which forced us to have recourſe to the title of MAGNESIA ALBA, &c. Dr. Pearſon has preſerved the old term, MAGNESIUM.

ACIDUM GALLICEUM is certainly not

not a proper tranſlation of GALLIC ACID. Were we to render ACIDUM GALLICEUM into Engliſh, we ſhould ſay, GALLICEOUS ACID. ACIDUM—ICUM is the generic termination.

CHAPTER VI.

OBSERVATIONS UPON SUCH PARTS OF THE SYSTEMATIC NOMENCLATURE, AS APPEAR TO HAVE BEEN LEFT DEFECTIVE BY ITS AUTHORS.

In the laſt chapter, I mentioned, that too much reſpect had been ſhown to the opinion of prejudiced individuals by the Authors of the French Nomenclature, when they omitted to baniſh, from their ſyſtem, whatever bore marks of the myſteries of Alchemy, or the ſecrets of empirical impoſition. It is however hardly to be expected, that even men of ſcience ſhould paſs, at once, from error to perfection; or, that the human mind,

in

in the moſt cultivated ſtate, ſhould not, in ſome meaſure, be bound to obſerve progreſſive ſteps of improvement.

Beſides the partial obſervations, offered in the laſt chapter, and chiefly confined to varieties, there are many ſpecies, and even genera of bodies, on which no name has been impoſed. We may attribute moſt of the faults I have obſerved, in treating the firſt of the heads, into which I have divided my ſubject, to the chaſms, that have been left by Meſſ. Lavoiſier, Berthollet, Fourcroy and Guyton; and which every perſon has attempted to fill up as caprice, or the idea he had formed to himſelf of the principles of the ſyſtem, ſuggeſted to him. We are not to be ſurpriſed, if ſuch terms preſent a motley aſſemblage, and deface the ſymmetry which can alone conſtitute that ſpecies of beauty, reſulting from uniformity. That ſuch chaſms do exiſt, is evident on the firſt inſpection

tion of the Chemical Vocabulary; and that they have been ſo filled to the great injury of order, appears in almoſt every publication. I ſhall very briefly point out a few of the moſt ſtriking caſes, in order to hold them up to general attention. They have eſcaped the notice, or not been thought worthy the obſervation, of very ſuperior men. It is not for me to dictate, or even to propoſe, a ſupplement to their work. This would require a conclave of men of ſcience and literature. The taſk of finding fault, if it be more ungracious, is within the reach of a greater number, than the power of ſuggeſting any thing, that may be permanently uſeful. I ſhall indeed totally avoid offering any terms, that can be employed in language, becauſe, as I do not think myſelf competent, and as others may think ſo too, it might create confuſion, if, from momentary neceſſity or convenience, a

word

word ſhould be paſſed into circulation, and if afterwards it were diſcovered not to bear the marks of ſterling value. If however an opportunity of extending the principles of the Syſtematic Nomenclature occur, I do not hold myſelf obliged, by the above declaration, to refrain from ſo doing. This is merely adding a wing to the edifice; it is not erecting upon a new plan, but extending the original foundation.

With regard to ſimple bodies, I do not ſee, why a compound word, denoting a property, ſhould have found its way into the ſyſtem. It had been much more analogous to nature, if we could have uſed ſuch terms to deſign her productions, as ſhe has uſed means towards their formation.

Simple combuſtible bodies form a genus of ſubſtances by themſelves; and if ever any improvement be adopted, ſome attention ſhould be given to this

natural

natural diviſion. A generic radix ſhould form the baſis; and with the change of termination, the word could be handed down through all the chemical changes, of which the ſubſtance is ſuſceptible.

The combinations of ſimple combuſtible bodies with Oxygen have received the generic name of OXIDES. OXIDES OF IRON, OF COPPER, OF TIN, form the ſpecies; but the varieties are deſigned by an epithet, denoting the colour. Thus a chemical change is expreſſed by a phyſical property; and no new light is thrown upon the ſubſtance, with regard to its ſtate of combination. It is abſolutely neceſſary, that the Chemiſt ſhall remember, which Oxide of Iron contains the greateſt quantity of Oxygen. But no intuition can inform him, that the order of their degree of Oxidizement is white, green, black, red. A name therefore, or a particle, or a compoſi-

tion

tion of the word Oxide, would be very uſeful in deſigning this ſeries; and when the ſtudent comes to ſee the Oxide, he cannot fail to find out its phyſical qualities.

A great confuſion, for inſtance, ariſes concerning the two ſtates of Muriate of Mercury. MURIATE DE MERCURE, MURIATE OF MERCURY. MURIATE OXYGENÉ DE MERCURE (as we would tranſlate it) OXYMURIATE OF MERCURY, or (as we *ſhould* tranſlate it) OXYGENIZED MURIATE OF MERCURY, are uſed by thoſe, who ſpeak the ſyſtematic language, to denote Calomel and Corroſive Sublimate. The former term is correct, the latter, quite the reverſe. In my experiments upon Hyperoxygenized Muriatic Acid, I have ſhown, that the exceſs of Oxygen in the ſalt, called Corroſive Sublimate, is combined, not with the Acid, but with the Oxide of Mercury. For Oxygenized Muriate of

Mercury

Mercury does not exiſt; and Hyperoxygenized Muriate of Mercury is a totally different ſubſtance from Corroſive Sublimate. Both Calomel therefore and Corroſive Sublimate are Muriates of Mercury. But in the one, the Oxide contains but little Oxygen, in the other much more, and both ſalts are white. In the other metals, the colour of the ſalt gets us out of all dilemmas, ariſing from the different degrees of oxidizement of the Oxides; and RED SULPHATE OF IRON, GREEN SULPHATE OF IRON, are ſufficient diſtinctions. From our being in want of a diſtinguiſhing term for the ſtate of the Oxide, and from the metal being ſo uncomplaiſant as not to change the colour of the ſalt it forms, although combined with an additional portion of Oxygen, we are forced, if we would be clear and preciſe, to uſe the old terms, which ought however to be exploded.

In

In Acids, the higher degree of acidification is always marked by the uſual termination IC, and the lower, by the termination OUS. If we were to extend this rule to the Oxides of thoſe ſubſtances, which are capable of containing different proportions of Oxygen, without manifeſting acid properties, we ſhould procure an eaſy method of denominating all ſuch bodies, and preſerve the uniformity of the ſyſtem. Thus, for inſtance, we ſhould have NITROGEN; NITROUS OXIDE; NITRIC OXIDE; NITROUS ACID, if it exiſt; and NITRIC ACID. That the ſtate, whether of gaſeity, liquidity, or ſolidity, be not pointed out, is no objection; for their exiſtence, in theſe ſtates, muſt be conſidered as accidental; and the actual one pointed out by an epithet. In fact, NITROUS and NITRIC OXIDES are known to us but in the ſtate of fluidity; and GASEOUS ſhould

always be prefixed to both, till we become acquainted with them in ſome other mode of combination with Caloric; or, when we mention them, as ſuppoſed to exiſt, ſo combined. It is almoſt uſeleſs to ſay, that, if this rule were once eſtabliſhed, it might be extended to the other ſubſtances, capable of ſimilar combinations. CARBONE, CARBONEOUS OXIDE, (common Charcoal) GASEOUS CARBONIC OXIDE, (Mr. Cruikſhank's Gaſeous Oxide of Carbone) and CARBONIC ACID. In fact, GASEOUS OXIDE OF CARBONE might as well be uſed to denote common Charcoal, in the gaſeous ſtate, as the true Carbonic Oxide; for no difference is pointed out, with regard to the quantity of Oxygen; but merely the mode of combination with Caloric.

This method however would be deficient, in as much as it cannot be extended to metallic oxides. FERRIC, FER-

FERROUS, ORIC, OROUS, ANTIMONIC, ANTIMONOUS Oxides, would not form ſo fit a part as the ſyſtem I have juſt propoſed.

We have many metals, that are capable of different degrees of oxidizement. Iron, for inſtance, has four Oxides that we know. According to Thenard, Antimony has ſtill more. But, although his memoir upon that ſubject be very ingenious, I muſt doubt a little any experiments, that pretend to mark a difference upon ſo ſmall a quantity as one per cent. Between the proportion of 16 & 20 per cent. of Oxygen, he eſtabliſhes, that there are four diſtinct Oxides of Antimony. It would have been hazardous enough to have aſſerted two. Every Chemiſt, who works BONA FIDE in analyſis, muſt allow the inefficacy of chemical means to attain ſuch preciſion. Nor does it at all derogate from the merit of the Philoſopher, who con-

feſſes that, if, in ſome inſtances, he can vanquiſh nature with her own arms, in others, ſhe poſſeſſes weapons, which he cannot oppoſe with ſucceſs.

From the impoſſibility of extending the mode of diſtinguiſhing the different degrees of oxidizement in metals, by the terminations in IC and OUS, it appears, that, for the ſake of uniformity, ſome other mode ſhould be adopted. And of theſe, an epithet, or a particle, prefixed to the word OXIDE, would be the moſt advantageous.

An entire kingdom, in the world of ſcience, with all its genera and ſpecies, has been left expoſed to the inroads of innovating Nomenclature. The principles of vegetable bodies have received names, and the *Matériaux Immédiats*, as Fourcroy names them, have all their diſtinguiſhing terms. But the combinations, which they form one with the other in that ſtate, have been left without

out conſideration in the general ſyſtem of Nomenclature. Some of the *Matériaux Immédiats* of the vegetable kingdom unite with thoſe of the animal kingdom; and we cannot expreſs their union but by a periphraſis. I have already mentioned one inſtance of ſuch a defect, in the combination of the Tanning principle with Gelatine. I have, in its proper place, mentioned the objections to TANNURET OF GELATINE, and therefore ſhall not repeat them here.

This perhaps might be the proper place for taking notice of an objection, that has been made to the French ſyſtematic nomenclature, for having attempted too much. It has been ſaid, that the neology has given names to ſubſtances, which cannot be well deſigned but by a periphraſis. This reproach is not founded, for there is no ſuch principle in the ſyſtem. Some perſons indeed, who have not very ſkilfully ex-

tended the nomenclature, or attempted to ſupply its deficiences, have been guilty of an unlimited ſtretch of principle. But it is neceſſary to make due diſtinction between thoſe names, which the ſyſtem has warranted by rule, and thoſe, which have been aſſumed by all, who have given what interpretation they choſe to the laws it has founded.

CHAPTER VII.

REMARKS UPON AN ESSAY ON CHEMICAL NOMENCLATURE BY DR. DICKSON.

WHEN the advantages of methodical nomenclature have been proved by the experience of many years; and when the ſyſtem, propoſed by the French Neologiſts, has been generally preferred and adopted, it would be loſs of time to contend in its ſupport. To anſwer the firſt chapter of Dr. Dickſon's "Eſſay on Chemical Nomenclature," would be to repeat what the Philoſophic Advocates of their ſyſtem had already ſaid. It is not my intention, in the preſent work, ſo much to impreſs the neceſſity

of methodical nomenclature, as to point out particular errors.

In the ſecond chapter, that upon the Names of Chemical Principles, Dr. Dickſon objects to any alteration being made in the appellation of FIRE. This objection too has been anticipated and anſwered by others.

In page 104, Dr. Dickſon objects to the term HYDROGEN, and upon a ground entirely new. He ſays, that OXYGEN means the generator of Acids; and HYDROGEN, the generator of Water. But, at the ſame time, he aſſerts, that Hydrogen is not the generator; but merely convertible into water, by its combination with Oxygen. In other words, it is the ſubſtance, upon which water is begotten. This certainly is a very delicate ſexual diſtinction, which he draws between the two poſſible methods of engendering a new ſubſtance. But would it not

not be as correct to ſay, that Oxygen is convertible into acids, by the union of combuſtible baſes, as to ſay, that it is the agent, by which they are converted into acids? Or by what law of nature can we frame the mode of diction, which ſpecifies the active and paſſive ingredient?

The term HYDRIC RADICAL, which he propoſes to ſubſtitute, is againſt all the principles of the ſcience, or of its Nomenclature. The ſubſtance is not *unknown*, and is not acidifiable; therefore, it could not receive the above denomination.

Dr. Dickſon is ſtill more ſevere upon the term OXYGEN, which, according to him, implies SHARPCHIN. His obſervations upon the etymology of this term are upon a par with thoſe of Mr. Sage, who ſays, that OXYGEN means the ſon of a VINEGAR MERCHANT.

But, ſays Dr. Dickſon, Do the embraces of this begetter of acids always prove fruitful? And then he adduces the old inſtances of its ſterile union with Hydrogen and with metals. Theſe are objections founded upon Chemical Facts; and if the Doctor had been more converſant in them, and had given more attention to the capacities of bodies, one for the other, he never would have made this remark. At the end of this paragraph, he diſcovers to us the real ſex of Oxygen, which, he tells us, is a female; and which he therefore challenges "*propter defectum ſexûs.*"

It does not appear, that any of thoſe remarks are ſufficient to overthrow the appellation, propoſed by the French Chemiſts. It is founded, not indeed upon a univerſal, but upon a leading property. If ſuch are rejected, when none better are to be found, (and Dr. Dickſon

Dickſon ſeems inclined to reject this principle of nomenclature,) we muſt let ſubſtances go nameleſs.

AZOTE has already been obſerved not to be the moſt eligible denomination for the Gas, ſo termed; but it is, by no means, ſo objectionable as Dr. Dickſon would make it appear. It is very true, that it is not the only Gas, which does not ſupport life. But it is the only one, which, till it was known to be a component part of Nitric Acid, and of Ammonia, appears to have no poſitive quality of any kind; and, in that, was perfectly diſtinguiſhable from all the other airs, which, like itſelf, are incapable of ſupporting animal life. The Doctor's objections to NITROGEN are founded, like thoſe to HYDROGEN, upon a ſexual diſtinction, which he excluſively ſeemed to have the gift of comprehending.

The chapter we are now conſider-

ing of Dr. Dickſon's work has for its title—" Names of Chemical Principles." If by them are meant the ſimple ſubſtances, he has mentioned five, allowed to be ſo. The remaining ſimple bodies, about ten times that number, have no place under this head.

In page 140, Dr. Dickſon propoſes to ſubſtitute NITRONE, in the place of both AZOTE and NITROGEN. Even if we do admit this term, the ſeries, that he deduces from this radical, is faulty throughout, as, without forming part of any other ſyſtem, it would be a deviation from that, which is in general uſe. It is not always very eaſy to follow Dr. Dickſon through his theoretic reaſonings, or to diſcover his own opinion; but it does not appear to me, that he proves, in a ſatisfactory manner, the value of thoſe denominations, founded upon theory.

NITRIAN, EPINITROUS, NITROUS AIRS,

AIRS, NITROUS VAPOR, NITROUS ACID, NITRIC AIR, NITRIC ACID, offer no regular ſeries among themſelves, and have no reference to a general ſyſtem. They poſſeſs no recommendation of brevity or perſpicuity, are introduced by no neceſſity, and ſupported by no advantages; therefore they may well be rejected.

In page 174, we are told, that Mr. Keir terms a mixture of vitriolic and nitrous acid, PHLOGISTICATED MEPHITIZED VITRIOLIC ACID. The term, MEPHITE, was long uſed to ſignify, at one time, Carbonic Acid; at another, Azote. But the latter ſeems to be that to which, on this occaſion, the name is particularly applied. We will then allow Dr. Dickſon's Nomenclature, for a while, and with him call AZOTE by the name of MEPHITE.—From MEPHITE, MEPHITIZED is an eaſy and natural derivation; and ME-

PHITIZED VITRIOLIC ACID will therefore, literally tranſlated into the French ſyſtematic language of Chemiſtry, mean AZOTIZED SULPHURIC ACID. But what AZOTIZED SULPHURIC ACID may mean, I cannot pretend to ſay. I have never heard of any method of combining thoſe ſubſtances, or that they were capable of union. MEPHITIZED NITROUS ACID means, according to the ſpirit of the above term, NITRIC ACID, impregnated with NITRIC OXIDE; but, in the plain and philoſophic ſyſtem, it cannot admit any interpretation, but Nitrous Acid the exiſtence of which is much doubted) united with Azote; a combination, which, if it be formed, comes under a denomination, eaſy to be found, by thoſe, who have a thorough knowledge of the principles of nomenclature.

It would be uſeleſs to follow Dr. Dickſon through his reſearches upon the

the origin of the word Nitre. The origin of radical names is of leſs importance, than the formation of their derivatives, to expreſs a concatenation of facts. But his obſervations upon NITROUS VAPOR offer more field for reflection. It is well known, that Nitric Acid is capable of holding in ſolution a certain portion of Nitrous Gas. The affinity of Nitric Acid for Nitrous Gas is ſo ſtrong, that, if the two ſubſtances be put in contact, they will incorporate, without mechanical means of mixture being employed. If heat be applied to expel the Nitrous Gas, it will fly off, and leave the Acid colorleſs. But, if they be ſuffered to remain in contact, the Gas will be reabſorbed by the acid.

If a current of Nitrous Gas be made to paſs through Nitric Acid, previouſly rendered colorleſs, the Gas is totally abſorbed, and the liquor becomes highly colored. But if this current be

further continued, a red Gas, which is not Nitrous Gas, will appear to be given out by the Acid, and may be condenſed by a new portion of Acid, or received in the Pneumatic Chemical Apparatus. This Gas is a permanently elaſtic fluid. Without the contact of Oxygen, it reddens the vegetable blues; and never loſes its colour. Upon examination, it is found to be compoſed of Nitric Acid, held in ſolution by Nitrous Gas. It is, in fact, the reverſe in point of proportion of the red fuming liquor above mentioned. The one is liquid Nitric Acid, holding in ſolution Nitrous Gas, and the other is Nitrous Gas, holding in ſolution Nitric Acid. And, as it does not appear, that there is any participation of principles in theſe ſubſtances, they cannot be denoted but by a periphraſis. Abbreviation of language, ſuch as is here propoſed, muſt beget obſcurity, and

lead

lead to a notion, that bodies are compounds, when, in fact, they are but mixtures.

It is wholly unphiloſophical to ſuppoſe, that the term OXYNITROUS ACID could be received to denote pure and ſimple Nitric Acid. In the firſt place, it is a ſoleciſm in terms; OXY (according to its uſual, though faulty, import, as in Oxymuriatic Acid) meaning a ſuperabundance of OXYGEN; NITROUS, a deficiency of OXYGEN: nor is there any neceſſity, even upon his own principles, for adopting Mr. Kirwan's DEMEPHITIZED NITROUS ACID. For that truly philoſophical Chemiſt confeſſes, that there are but two ſtates of the Nitric Acid. It is uſeleſs to prefix an epithet to the other ſtate, which is rendered ſufficiently plain by the oppoſition of the firſt.

We have already ſeen the impropriety of OXYMURIATIC, &c.

Upon

Upon what principles is the name ARSENITIC ACID formed? Why ſubvert the elements of a clear and luminous ſyſtem, for the uſeleſs and wanton introduction of anarchy and obſcurity?

MOLYBDENIC, TUNGSTENITIC, are treated at large in a former chapter.

In his obſervations upon the term FIXED AIR, Dr. Dickſon aſſerts, that the intereſts of ſcience would be promoted, by accommodating the language of philoſophers, as much as poſſible, to that of the vulgar. If by this is meant, that, in the language of ſcience, we are to adopt all the erroneous expreſſions and extravagant ſoleciſms of common ſpeech, a gloſſary of vulgar errors would be neceſſary to form a connection between the language, that deſcribed, and the thing to be underſtood. There was a time indeed, when the oppoſite extreme was prevalent; and

and the ruins of every thing, that was barbarous and extravagant, were ranſacked to furniſh a language, which no perſon could underſtand. Allegories were frequently ſtarted, but croſſed before the middle of their courſe; and alluſions were dragged in to blind the multitude. Even thoſe, who were the moſt converſant in myſtic language, could not underſtand "THE FLIGHT OF THE RED LION;" and the moſt conſummate mythologiſts were puzzled, when they were told the WHITE EAGLE had fled from the embraces of DIANA. If to ſhun ſuch forced metaphors as theſe be what Dr. Dickſon means, by accommodating the language of philoſophers to that of the vulgar, he will have many partiſans. But he would have many opponents, were he to ſupport the propoſition in its full extent. It would not be more ſtrange for a Profeſſor to tell his pupil,

"This

" This ſubſtance you ſee before you, ſo volatile, ſo pungent, ſo ſuffocating, &c. is FIXED Air," than to call a palpable ſubſtance, " WHITE NOTHING, or a metallic Oxide, PHILOSOPHER'S WOOL." The language of the vulgar muſt be influenced by the multitude, that ſpeak it. But the language of Philoſophy ought to be formed by Philoſophers; and as, in general, it is ſpoken but by them, it may remain Philoſophic.

We have an example, in the next article, of the inconvenience of uſing common names in the language of ſcience. Vinegar, properly ſpeaking, is not a homogeneous product; therefore, it is not capable of claſſification, either by its nature or its name. As to ACETOUS and ACETIC, ſee a former chapter.

All the PYRO-ACIDS having been found by Meſſrs. Vauquelin and Fourcroy to be the ſame; it is uſeleſs to diſcuſs the merits of their names.

SAC-

SACCHARINE ACID is objectionable, on account of its termination, independently of any other reaſon, that muſt ſanction the preference to OXALIC.

SEBACEOUS ACID, 212, is an extraordinary example of inconſiſtency. In the whole of Dr. Dickſon's Eſſay, his great object appears to be to combat the principles and ſyſtem of the French Nomenclature. He has propoſed no ſyſtem of his own, and adopted no method, that can be traced through a ſingle ſeries. In this inſtance, however, he has recourſe to thoſe very principles he uſually cenſures, to alter a name, which ſhould not be altered, and for a reaſon, which cannot be tolerated.

He ſays, that "SEBACIC ACID ſhould be termed SEBACEOUS, becauſe it does not appear to be ſaturated with Oxygen;" and, as a proof of this, he obſerves, that "if Sulphate

of

of Soda be diſtilled with Sebacic Acid, the Sulphuric is converted into Sulphureous Acid." But moſt vegetable and animal ſubſtances will act in the ſame manner, when Sulphuric Acid is diſtilled upon them; and even Vinegar, the laſt retreat of VegetableAcids, (that into which they are all ultimately converted, when purſued by Nitric Acid,) produces the ſame effect. But are we to argue from this, that Vinegar is not ſaturated with Oxygen? The fact is, that all theſe vegetable products poſſeſs a quantity of Oxygen, ſufficient to ſaturate them, as long as they remain themſelves. When they become other ſubſtances, they undergo new modifications, and their principles ſuffer a new order of arrangement. Were we to adopt this name, as a principle of Nomenclature, throughout the claſs of Vegetable Acids, it would create ſuch confuſion, as totally to ſubvert the

ſyſtem

ſyſtem of Chemical Language. I muſt remark alſo, that the experiment, upon which Dr. Dickſon founds this wiſh for the change of SEBACIC into SEBACEOUS, is not accurately ſtated. The Vitriolic Acid is not, as he ſays, driven off from Vitriolated Foſſil Alkali. Sulphate of Potaſh, indeed, undergoes a partial decompoſition, becauſe this ſalt can combine with an exceſs of Acid; and many Acids, really weaker, can effect a partial decompoſition, by the co-operating affinities of Sulphate of Potaſh for Sulphuric Acid; and of Potaſh, for the Acid, which is uſed.

SERICEOUS ACID, inſtead of BOMBIC, has no claim to preference. It is totally irregular; and an unneceſſary change.

The names, which Dr. Dickſon propoſes for the Alkalis, are the ſame with thoſe, which have been cenſured in a former chapter. It is therefore uſeleſs

to

to repeat what has been already ſaid. But his ſtrictures on AMMONIA are ſufficient to prove, how obdurately he was bent on finding fault.

In the chapter upon Earths, we find many terms, which may be adopted; and which are, in fact, the ſame with thoſe in general uſe. ARGIL for ALUMINA, and SILICE for SILICA, are leſs homogeneous with the Nomenclature, than the names, given to thoſe ſubſtances by Dr. Pearſon. Dr. Dickſon, however, has inſerted a number of Earths, that have no exiſtence in nature. SIDNEIA, ADAMANTIA, and OSSIA, were no ſooner announced to the learned world, than they proved to be beings of fancy. Mr. Klaproth did not long continue in his error concerning Adamantia, and was the firſt to detect it.

To create a Syſtem of Nomenclature, in any ſcience, requires ſome-

thing

thing more than the knowledge, which is to be acquired by reading, or by argument. Chemiſtry, above all, is a ſcience of facts; and, to judge of them, the only method is experiment. Many perſons of reputed accuracy will announce diſcoveries, which ſtill elude the reſearches of others; and the man, who is in the conſtant habit of queſtioning, by experiment, the validity of authorities, will alone be capable of judging, when confidence is to be beſtowed, or when with-held. Plauſible aſſertions, ſpecious arguments, and ſeeming demonſtrations, impoſe upon the Chemiſt (if ſuch he can be named) whoſe only experience conſiſts in ſuch knowledge as may be acquired from reading; and who has never ſeen a crucible but through Algebraic calculations. There cannot be a more certain teſt to diſtinguiſh the compiler of the obſervations of others from him, who

ſeeks

ſeeks the truth by experiment, than an indiſcriminate reliance upon all, who announce ſome important diſcovery. The working, Chemiſt learns, ſometimes to his coſt, that it is not every perſon, who writes a chemical Eſſay, that deſerves the name of Chemiſt. But the mere receiver of chemical knowledge either totally diſregards whatever is new as incredible; or eſtimates the truth by the brilliancy of the pretended diſcovery.

In the laſt chapter, Dr. Dickſon treats of Neutral Salts, and prefers the claſſification, which aſſumes the Baſis for generic characters; and the Acid, for the ſpecies. There may be ſome reaſon for this, though not enough to require a total ſubverſion of the uſual order. Innovation ſhould be called for by abſolute neceſſity; and alterations, ſupported by inconteſtable propriety. This is not one of thoſe deſperate caſes,

that threaten the ruin, or impede the progreſs of ſcience. Many Chemiſts are of a different opinion from Dr. Dickſon; and I think the ſum of arguments, on each ſide, nearly equal. But we cannot allow any art or ſcience ſo far to invade the territory of Chemiſtry, as to fix by principles, foreign to the latter, the claſſification of ſubſtances, which appertain to it alone; and whatever ſubſtance is conſidered chemically, is, for the moment, the property of that ſcience excluſively. Why ſhall we then adopt that arrangement for neutral ſalts, which is founded on their medicinal properties? When we conſider, in a chemical point of view, the liſt of Sulphates, or the Ammoniacal Salts, we do not want to know which of them is purgative, which emetic, or which corroborant. That belongs to medicine, and medicine may claſs the Salts, according to their rank in the

Materia

Materia Medica. But the Chemiſt muſt inquire, by what chemical properties he can diſpoſe them, ſo as to preſent, at a ſingle view, firſt, their generic properties; and afterwards, the leſs perceptible ſhades, that conſtitute the ſpecies.

Dr. Dickſon's next argument, in ſupport of this mode of taking the generic character of Neutral Salts from the Baſis, not from the Acid, is full as fallacious. Becauſe ſome of the Acids are convertible into one another, he would exclude each of them, during its individual exiſtence, from poſſeſſing any ſhare of power in giving name to a genus. But, in examining the properties of Oxalic Acid, as Oxalic Acid, our minds are not to be occupied upon the ſugar, which, in part, it was, or the vinegar, which it may, in part, become. It is, for the time being, as much an individual unity, and as much itſelf, as any body in the univerſe. A ſmall

acquaintance

acquaintance with operative chemiſtry is ſufficient to convince us of it.

Dr. Dickſon next criticiſes what he calls the pretended ingenuity of the French Chemiſts, who adopted the arrangement by Acids, in order that they might introduce their terminations to expreſs the degree of Oxygenizement. But there was no neceſſity for this claſſification to introduce the terminations. The expreſſion, SULPHATE OF BARYTES, does not more denote the genus to be dependent upon the Acid, than upon the Acidifiable Baſis. For SULPHATE, prefixed to BARYTES, may denote the ſpecies as well as the genus.

But there is a much greater miſtake in this paragraph, and one, which ſhows, that ingenuity alone is not ſufficient to form a chemical philologiſt.

The doctor objects to this claſſification, and to thoſe denominations—

" Secondly, becauſe this diſtinction of " Neutral Salts, by three degrees of " Oxygenation of their Acids, is arbi- " trary and fallacious. The ſame " Acid, with which we compoſe Neu- " tral Salts of different ſpecies, is always " in a different ſtate of Oxygenation " in Alkaline, Earthy, and Metallic " Salts. Nay, perhaps, every ſub- " ſtance capable of combination with " an Acid, exhibits its affinity to it " eminently, or even, in ſome inſtances, " ſolely, when the Acid is in a ſtate " of Oxygenation, peculiarly adapted " to it. Metals, in general, require " the Acids, with which they unite, " to be more oxygenated, than Alkalis " or Earths do; and ſome Metals re- " quire a greater degree of Oxygena- " tion than others; yet Manganeſe " will not unite with the Nitric Acid, " until it loſe ſome of its Oxygen, and " become Nitrous Acid; while Vege-

" table

" table Alkali affects the Nitric, and re-
" gards the Nitrous ſo little, that it re-
" ſigns it even to the Acetous." Almoſt every ſentence of the above quotation contains ſome miſtake in the common knowledge of chemical facts. It is not true, that Acids are always in a different ſtate of Oxygenizement in Alkaline, Earthy, and Metallic Salts. They do enter into ſuch combinations in different degrees of Oxygenizement; but they are thus oxygenized previouſly to the union, and their ſtate is uniform, and conſtant for all Alkalis, for all Earths, and for all Metals; and does not vary according to the particular diſpoſition of every individual baſis. Metals therefore do not require their Acids to be more oxygenized, than Earths and Alkalis; and the variation of Oxygen, in Metallic Salts, is in the Metallic Oxide, and not in the Acidifiable Baſis. It is an error alſo to ſuppoſe that, becauſe

the black Oxide of Manganeſe more readily combines with what Dr. Dickſon terms Nitrous, than with Nitric Acid, it really has a ſtronger affinity for the former. Black Oxide of Manganeſe contains ſo great a portion of Oxygen, that it cannot readily combine with any of the Acids, but with ſuch as can aſſume to themſelves, or totally diſengage a portion of its Oxygen. The preſence of a certain ſum of Oxygen, and no more, is neceſſary to promote the ſaline union; and if there be too much in the Baſis, and too little in the Acid, the deficit of the latter may be compenſated by the ſuperabundance of the former. But the Acid has changed its nature, and become more oxygenized, while the contrary proceſs has taken place in the Oxide. Hence it is, that it may be neceſſary to deprive Nitric Acid of ſome portion of its Oxygen, as Bergman recommended by

Sugar,

Sugar, &c. that it may afford room for the ſuperabundant Oxygen of the Oxide of Manganeſe; and hence too, that Sulphureous Acid acts with ſo much facility upon the ſame Oxide. But the Salts, which are formed, contain neither Sulphureous nor Nitrous Acid, nor black Oxide of Manganeſe, and are not Nitrite or Sulphite of Manganeſe, but Nitrate and Sulphate, formed by the white Oxide of Manganeſe, as may eaſily be proved by experiment.

In Dr. Dickſon's Eſſay, I might have pointed out numerous inſtances of inaccuracy in the ſtatement of chemical facts; but they are not ſo much my preſent object, as Nomenclature. Compilation, generally ſpeaking, is a peculiar art, and is often ſucceſsfully practiſed by perſons, who do not poſſeſs a very profound knowledge of the ſubject. As long as the compiler obſerves his original, he may proceed,

without much danger, in the path already trodden. But as ſoon as he abandons this, he requires a more ſtable prop, than conjecture or hypotheſis, to ſupport him. Ingenious reaſoning cannot ſupply the place of fact; and from no relation of an experiment can we reap the advantage we acquire in beholding it. Beſides intellectual knowledge, there is a viſual experience, which the eye acquires, and which cannot be learned from precepts. It is as eaſy to diſtinguiſh the Chemiſt, who has ſeen, from him, who has only read experiments, as to detect the traveller, who, from the documents of others, deſcribes the face of a country, which he never had traverſed, or the manners of a people, among whom he never had reſided.

In page 273, we have Medicine aſſuming a right to give names to chemical ſubſtances; and becauſe ſome metallic

metallic combinations are cauſtic, Dr. Dickſon wiſhes to prefix to them either that epithet, or corroſive. It would be as unmethodical to admit this, in General Chemiſtry, as it would be faulty not to deſign thoſe qualities, in Pharmaceutic Preparations.

Were all Dr. Dickſon's obſervations and denominations made in the ſpirit of that, which next preſents itſelf, we ſhould have occaſion only to applaud throughout. The prepoſitions, SUB and SUPER, to denote the relative ſtate of the Acid and the Baſis, are juſt and philoſophical. Yet, even here, Dr. Dickſon cannot paſs by the ſyſtem, without endeavouring to pull down a few looſe ſtones, if any ſuch he find in his paſſage. He ſays, that SUBBORATED FOSSIL ALKALI would ſound pedantic. We muſt agree with him, that this name, which is of his own creating, is objectionable; but SUBBO-

RATED SODA is both proper and accurate.

To how many objections is not SODATED TARTAR expoſed! There can be no SODATED TARTAR without SODIC ACID; and TARTAR is not an alkaline, earthy, or metallic baſis.

I ſhall now take leave of Dr. Dickſon's Eſſay, upon which I have dwelt ſomewhat longer than the nature of the remarks, which it has drawn from me, rendered agreeable. The few terms, which remain, are given with the ſame ſpirit of diſorder and caprice. If it ſhould be ſaid, that, in judging Dr. Dickſon, I have conſtantly referred to a ſyſtem, which he has not adopted, and tried him by laws, which he does not acknowledge, it muſt alſo be remembered, that they are the only code of laws, by which he can be tried; that he never fails to claim their protection whenever it may aid him; and that he

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has not attempted to form any ſyſtem, that may replace what he ſeeks to aboliſh.

Upon the whole, this Eſſay appears to have been written with a view to overturn the French Syſtematic Nomenclature of chemical bodies. The motives of this attempt, I cannot ſay, ſeem to be the removal of obſcurity, or the advancement of ſcience; and the object of it is far from being attained. It is not very probable that the mind, which has been employed in elucidating and arranging, will ſuddenly relapſe into confuſion; or that thoſe, who, from long habit or prejudice, have refuſed to adopt the ſyſtematic language, will uſe a mode of phraſeology, deviſed without taſte, and dictated without principle. Upon a firſt peruſal of the work, I had ſome difficulty to perſuade myſelf, that the author did not intend it as a burleſque upon the ſcience and

its terms. But upon looking over it a ſecond time, I perceived that he muſt have been ſerious. Some ſhare of praiſe, however, is certainly due to Dr. Dickſon. There is much erudition in his Eſſay, and ſome ingenuity in ſeizing every opportunity to diſplay it. There are many Greek and Latin quotations; and very antient authors are introduced as authorities in Modern Chemiſtry. But there is a great deficiency of that kind of learning, which is the only one, indiſpenſably neceſſary in forming a Syſtematic Nomenclature of Chemical Science, a thorough knowledge of chemical truths. Dr. Dickſon does not yet ſeem to have determined, which doctrine, whether that of Stahl, or that of Lavoiſier, he had adopted, or whether he had adopted any. It is not certain, whether he will follow a ſyſtem of Nomenclature, or imagine names for Acids, Salts, and

Alkalis,

Alkalis, by which it may be impoſſible to diſtinguiſh the individuals. He ſometimes begins a ſyſtematic ſeries of denominations, and before the ſubſtance has gone through one half of its poſſible combinations, repents that he has done ſo. A want of candour is perceptible through his whole work, in paſſing ſentence, not only upon the French, but upon every other Nomenclature. Whenever Voltaire was deſirous of being particularly ſevere upon our great bard, he began by creating faults where he could not find them; and, in order to make the matter certain, he tranſlated him.

Thus Dr. Dickſon has tranſlated *Materia perlata Kerkrengii*, CONVEYED MATTER OF KERKRENGIUS. *Luna Cornea*, HORNY MOON.—*Ens Martis*, SWORD OF MARS! But here indeed he has equally compromiſed his candour and his ſcholar-

ſhip; and, leſt he ſhould be accuſed of the one, has ſacrificed the other; for there is not a ſchoolboy in the Latin Grammar, who could not have told him, that *Ens* never yet ſignified a ſword. When ſo great a diſplay of claſſical knowledge, as is manifeſt throughout the Eſſay in queſtion, is applied, as we find it here, it is impoſſible to ſuppoſe any other reaſon for ſuch miſtakes, but wilful miſrepreſentation.

I ſhall conclude this chapter by obſerving, that, although I may have overlooked ſome faulty denominations in Dr. Dickſon's Eſſay, I have mentioned a great number, not becauſe I think they merited ſeparate diſcuſſions, but becauſe they afforded opportunities of applying and dwelling upon the principles of the French Nomenclature.

CHAPTER

CHAPTER VIII.

REMARKS UPON A PAPER, ON CHEMICAL AND MINERALOGICAL NOMENCLATURE, BY MR. KIRWAN.

HAVING employed ſo much of the ſhort period of time, allotted to this Eſſay, in conſidering chemical facts, miſſtated both wilfully and unwittingly, it is a relief to turn to the works of an author, whoſe very errors are inſtructive. The learned Preſident of the Royal Iriſh Academy has given ſuch examples of ingenuouſneſs and candour, as are rarely to be met with. He has diſcuſſed, with ſo much liberality, every point, which could lead him to conviction, that future antagoniſts cannot fear

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he will refuſe to hear them. But he has always ſhown too much ability not to check their hopes of ſucceſsful oppoſition. Fully impreſſed with theſe ideas, I find myſelf obliged to animadvert upon ſome of his opinions, with regard to Chemical Nomenclature: 1ſt, Becauſe they properly come under the ſubject of my conſiderations. 2dly, Becauſe they are the opinions of the moſt reſpectable authority. And 3dly, Becauſe they ſeem to me to be erroneous.

Mr. Kirwan ſays, that "SCREW "SCHRAUBER, though ſimple words, "are as well underſtood, as BAROME-"TER SCHWERMESSER, and that "therefore compound words are uſe-"leſs." It is of little conſequence in vulgar language, what the word may be, if it be but underſtood; and common uſage will ſoon level all diſtinctions of ſimple and compound. Indeed not

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one half of thoſe, who uſe the inſtrument, could ſay whence BAROMETER is derived, or whether it be not a ſimple word. The term may, therefore, be conſidered by thoſe, who are unacquainted with its etymology, as a ſimple term, and the inſtrument, as a ſimple inſtrument. But if any complex machine be hereafter made, in which the Barometer ſhall, as Barometer, be an integrant part, the moſt proper mode of deſigning ſuch a machine, would be by a word, compoſed of the names of the ſimple inſtruments.

In a former chapter, I mentioned the advantage, which a ſimple name muſt ever poſſeſs over any compound, however ſignificant, impoſed upon a ſimple body. Simplicity indeed is the moſt deſirable quality in the denomination of ſimple radical ſubſtances. We cannot look for ſymmetry in a ſingle inſu-

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lated term. It is in the conſtant and ſyſtematic analogy, to be obſerved between the new compounds of the ſimple ſubſtance, and the new derivatives of the ſimple name, that the harmony of nomenclature is to be preſerved. It is not an impartial mode of ſtatement, to compare the detached terms of common life to the affiliated denominations of ſcience. And although the word, GLOVE, be full as appropriate as HAND-SHOE; EPSOM and GLAUBER, for reaſons which it would be uſeleſs to detail, can never be as luminous as SULPHATE OF MAGNESIA, or OF SODA. Nor is there any rule, by which we could decide, whether the analogy of HAND-SHOE, or of FOOT-GLOVE, be the ſtronger; but there are many reaſons, why no name but SULPHATE OF SODA can convey an adequate idea of the nature of the ſubſtance it deſignates. The words

words of common language are, for the moſt part, received in our infancy without reflection, and retained in mature age without effort. But in ſcience we muſt reaſon; and, where a ſyſtem of derivatives can be happily deviſed from well contrived roots, the memory, while it is ſtrengthened and relieved, participates in the functions of a higher faculty.

I do not immediately ſee why the two firſt rules of M. de Morveau, quoted by Mr. Kirwan, ſhould have led him to prefer the old names, to names derived, as he ſays, from Greek and barbarous Latin; and to adopt HEPAR, inſtead of SULPHURET. I ſhould have been inclined, from thoſe very rules of M. de Morveau, to have drawn the directly oppoſite concluſions to thoſe of Mr. Kirwan.

Mr. Kirwan ſays that, according to M. de Morveau's third rule, we ſhould baniſh the name of Water, and ſay,

HYDRO-

HYDROGENATED OXYGEN, or OXYGENATED HYDROGEN. As to the baniſhment of the term WATER, the thing itſelf is ſo common in the uſual intercourſe of life, that we ſpeak of it, without conſidering its nature. But if, in treating of the ſcience of Chemiſtry, we were aſked, What is that ſubſtance, which, for inſtance, holds the ſalt of the ſea in ſolution? our firſt anſwer would be, WATER. If we are perſecuted further by queſtions, we ſhall ſay, that it is A COMPOUND OF HYDROGEN AND OXYGEN. A little further ſtill, and the true and ſcientific anſwer muſt be made. It is an OXIDE OF HYDROGEN. It is in this philoſophical point of view, that Mr. de Morveau ſays, "that the denomination of a chemical compound is neither clear nor exact, unleſs it expreſſes, by names conformable to their nature, the ingredients which enter into that compound." It would be pedan-

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tic in an aſtronomer to ſay, "The part of the earth which we inhabit is juſt turned from the ſun," if he meant to tell his friend, that the ſun was ſet. And, in all probability, Sir Iſaac Newton himſelf would not have been ſhocked, if he had heard a peaſant diſcourſe of ſun-riſe. But if a philoſopher, in ſtating a philoſophical queſtion, ſhould talk of the revolution of the ſun round the earth, then indeed his auditors might have reaſon to be ſurpriſed. And no argument can prove why, in one ſcience, we ſhould not uſe philoſophical language, when it is ſpoken in every other with propriety.

As to the words SOAP, GLASS, &c. they come under a certain claſs of ſubſtances, which it is not very eaſy to name or even to arrange methodically. It never was ſuppoſed, that the New Nomenclature had attained, or could attain perfection; and ſuch ſubſtances, as

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are not comprehended in thoſe, which the 7th rule, chap. 1ſt, particularly regards, are compriſed among thoſe, to which the obſervations of the ſixth chapter particularly apply. In the preſent inſtances, however, Mr. Kirwan reflects upon the French Neologiſts, rather becauſe they did not do enough, than becauſe they did too much.

Mr. Kirwan next contends for maintaining the names of inventors or diſcoverers, as GLAUBER, SYLVIUS, &c. and ſays that, if theſe are rejected, then for the ſame reaſon, ALEXANDRIA and CONSTANTINOPLE, with all names derived from the founders of cities, muſt be altered, to make room for ſuch others as would expreſs their ſituation. I think it may be proved, that the very reaſon, why names derived from the founders of ſtates and cities ſhould not be changed, is the ſtrongeſt argument againſt preſerving the names of diſcoverers in

ſcience.

ſcience. Hiſtory is, or ought to be, a plain narration of facts, in the order of ſucceſſion. A knowledge of geographical poſition is neceſſary to the reader of hiſtory, as it ſubſtantiates to his mind the names of nations and of cities; and, as binding him down to ſome ſpot upon the globe, it gives him reaſon to think he is occupied by ſomething more real than fairy tales. Geography therefore, when conſidered with hiſtory, is a ſecondary object; and cannot enter into competition for the right of giving names. But the object of hiſtory is confined to the ſimple narrative of a ſeries of facts in the order of ſucceſſion. The leſſons which may be drawn from it by the prince, the conqueror, or the legiſlator, are the application of ſuch facts to their conduct, in their various political relations. If, from a peruſal of hiſtory, we acquire a knowledge of mankind, it is not from precept or from princi-

ple

ple, but from deductions we ourſelves muſt make. The only precepts it affords are to be looked for in the examples, that conſtantly convey them; and the only principles are the ſucceſſion of facts. But the hiſtory of Chemiſtry is a mere introduction to the ſtudy of the greater truths which it contains; and whether Glauber or Sylvius be the diſcoverer, we are nothing the wiſer as to the real nature of the ſubſtance. Let Alexander and Conſtantine therefore give names to the cities they have ſacked or founded; but let us appeal to nature for the denomination of natural bodies.

I do not however mean to ſay, that the name of a diſcoverer is to be excluded in every caſe from a Syſtem of Scientific Nomenclature. Perhaps as good an appellation as can be given to a ſimple ſubſtance is that of the perſon, who firſt perceived it; particularly if the

name

name can be ſo contrived as to admit eaſy derivatives. Thus, in a very recent caſe, GADOLINITE * is not an improper term; and it would have been ſatisfactory to have heard the name of SCHEELIUM † given to ſome one of the numerous ſubſtances, diſcovered by that philoſopher. But where the nature of a body (as muſt be the caſe with a compound) is to be expreſſed, the ſatisfaction of rewarding merit in this manner, muſt be given up in favour of more eſſential conſiderations.

Our celebrated author mentions next the denominations, by which Mr. Berthollet choſe to deſign all the different combinations of Sulphur with Hydrogen; and which Mr. Kirwan has called the beſt that could be choſen, in the principles of the New Nomenclature. I

* ITE would be better changed for ſome unmeaning termination. See before.

† See Abbé Haüy.

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muſt again differ from this able chemiſt; for I do not think that they are the beſt names, pointed out by the ſyſtem; or even, that they are, in any degree, ſuch as mature conſideration would have adopted.

SULPHURE, SULPHURET, we have mentioned already. It is conformable to rule; but it is not one of thoſe, which Mr. Berthollet has propoſed in the Memoir, quoted by Mr. Kirwan.

HYDROGÈNE SULFURÉ, SULPHURETTED HYDROGEN, is not exceptionable, and even independently of ſyſtem is preferable to the term HEPAR. For HEPAR is unmeaning to all who do not know Latin; whereas SULPHURETTED HYDROGEN, as it is now received into the language, is Engliſh, as much as BAROMETER, and the foreign extraction of this word has been no objection with Mr. Kirwan.

SOUFRE

SOUFRE HYDROGENÉ is not quite ſo methodical. The impropriety of HYDRO-SULFURE I have already mentioned; and SULFURE HYDROGÈNÉ is exceptionable.

It is a rule generally followed in the new Nomenclature, that when bodies of a ſimilar nature are combined, the ſimple name of each ſhould take its place in the compound denomination, accordingly as it is predominant, or as it gives the chemical character to the compound. In one caſe, therefore, SULFURE D'HYDROGENE, SULPHURET OF HYDROGEN, or HYDROGENE SULFURÉ, SULPHURETTED HYDROGEN, would be the proper term. In the other, we have heard HYDRURE, HYDRURET, made uſe of. But HYDRURET means a combination of WATER, not of HYDROGEN. Water is not a ſimple combuſtible body; but HYDRURET

bears the generic termination of ſuch ſubſtances. Therefore HYDRURET is a ſoleciſm. We cannot ſay, HYDROGENATED, or HYDROGENIZED, for ſuch terminations do not come under thoſe, ſet aſide to denote the combinations of ſimple combuſtible bodies. There certainly is a term, the moſt proper to denote that ſtate of the combination of Sulphur with Hydrogen, in which HYDROGEN ſhould hold the firſt place in the compound name. But I confeſs I am afraid to mention it thus abruptly, till I have offered ſome reflexions upon the conſideration, which euphony deſerves, when compared to the rigid propriety of ſcientific language. This object will be diſcuſſed in a part, reſerved for ſuch obſervations, as do not properly come under the head of Nomenclature.

The terms, propoſed by Mr. Kirwan, are

are much more exceptionable, as they are not in conformity to the French ſyſtem, and as they do not form part of any independent ſyſtem.

Mr. Kirwan makes ſome obſervations upon the preface to Lavoiſier's Treatiſe on Chemiſtry, and finds fault with that immortal author, and with M. de Morveau, for ſaying, that the memory of learners is much aſſiſted by compound denominations expreſſing the compound ingredient of ſubſtances. Mr. Kirwan replies, that the ſcience is not to be charged with a cumberſome train of words, merely to gratify the indolence of beginners. There is a very wide difference between the gratification of indolence and the removal of difficulties; between the neceſſary application without which no ſcience can be attained; and the labour, which muſt be employed to find out

the way amid the darkneſs, in which chemiſtry was, till lately, enveloped.

When I was at Paris, where there is ſo much opportunity for acquiring true ſcientific chemical inſtruction, I had opportunities of making obſervations in three ſchools, where chemiſtry was taught. In the firſt, the old method was followed in all its integrity, both with regard to names and principles. In the ſecond, the Profeſſor had adopted the modern theory in its full extent; but being ſomewhat advanced in years, when it was eſtabliſhed, and his enmity to all innovations being particularly ſtrengthened from his having been a ſufferer by ſome, he could not bring himſelf, in the familiar ſtyle of his lectures, to uſe, or even, much to recommend the methodical nomenclature. In the third ſchool, both the new theory and the

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new nomenclature were adopted and ſtrenuouſly recommended. In this ſchool, the ſtudents made the moſt rapid progreſs, and from it have proceeded ſome of the firſt chemiſts that now cultivate the ſcience. The ſucceſs of the ſecond ſchool was ſuch as might be expected from the leſſons of a very learned and venerable teacher, who however neglected the uſe of ſuch blandiſhments, as might allure the taſte, and relieve the underſtanding; while the firſt was an object of mockery and deriſion to the few who had leiſure and patience to attend a whole lecture, without comprehending a ſingle word that had been ſpoken. The advantages therefore of a methodical nomenclature are not leſs proved by this practical fact, than the clearneſs of the Lavoiſierian ſyſtem.

It is very true, that ſyſtems are

creatures of convenience; but M. Lavoiſier is rather to be cenſured for having preſerved BORAX and NITRE, than Mr. Kirwan to be imitated for wiſhing to introduce EPSOM and GLAUBER.

VOLALKALI has been already taken notice of; and, for TARTARIN, I refer to a letter from a correſpondent in Nicholſon's Journal. FULIGINATED is ſo extraordinary a term, that I cannot allow myſelf to offer any reflexions upon the ſubject.

Mr. Kirwan ſays, that OXIDE in our language naturally expreſſes the HIDE OF AN OX; and that in pronunciation they cannot be diſtinguiſhed. I have never met any perſon, who has been thus miſtaken. There is a want of aſpiration in the ſecond ſyllable of OXIDE, that muſt always diſtinguiſh it, unleſs in a very provincial mouth. From the ridicule that particular

ticular dialects may confer, no word indeed can be exempt; and the North Briton may as well object to CAUSTIC, becauſe his common pronunciation is COWSTICK, as a Weſt Briton to the word OXIDE, on account of the aſpirated ſound which he gives the ſecond ſyllable. But, in the uſual mode of ſpeaking, there is no danger to be apprehended from the miſtakes, that might ariſe from nomenclature of this kind.

Upon the whole, Mr. Kirwan ſeems to be convinced, that there are certain advantages attending methodical nomenclature, but he cannot bring himſelf to adopt it altogether. He is ſo fully impreſſed with a dread, that the works of Stahl, Geoffroy, Duhamel, Macquer, Scheele, and Bergman will not be underſtood, that he would reject whatever might tend to render the language, in which they have written,

obſolete. It is very true, that we ſhould be much diſſatisfied with whatever could accelerate the extinction of writings which have conferred ſuch advantages upon the ſcience. In the works of the author before us, we have a proof how much we are diſſatisfied with whatever tends to render the ſenſe of a valuable writer obſcure. The terms, which participate in the fault, we cannot hear pronounced with patience. What recompenſe of clearneſs or perſpicuity can FULIGINATED, BARO-SELENITE, SYLVIAN, GLAUBER, STRONTHIAN-LIME WATER, SATURNINE SOLUTION, ACIDO-FULIGINATED CALX, &c. ever beſtow upon us, if they obſcure a ſingle ſentence of the *Docimaſtic Eſſays*, or of the *Eſſay on the Analyſis of Mineral Waters?* Mr. Kirwan has ſet too fierce a dragon to guard his golden apples. He is the only perſon who can attempt

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to remove it. There is wanting but this one effort more to render his triumph, over prejudice, almoſt unexampled in the annals of philoſophy.

CHAPTER IX.

OBSERVATIONS ON SOME PARTS OF CHEMICAL LANGUAGE, WHICH DO NOT PROPERLY COME UNDER THE HEAD OF NOMENCLATURE.

THE language of Chemiſtry, with regard to its practical purpoſes, may be divided into two heads. Beſides the terms which are applied and appropriated to chemical bodies, there is a technical language which is uſed to expreſs the mutual relations of thoſe bodies, and to form the connections of chemical diſcourſe. Such language muſt be ſimilar to that, frequently occurring in common life. But, in deſcribing the higher operations of ſcientific chemiſtry, ſome of the words employed

employed muſt have an origin and an import totally different from general phraſeology. I have offered ſuch obſervations upon the names of chemical bodies as were conſonant with the nature of this Eſſay; with the preſent ſtate of chemical knowledge, and of chemical language; and, with my previous reſolution not to take upon myſelf the alteration of any principle.

I ſhall now enter upon a new conſideration, and turn to that part of chemical language, which ſerves as the means of conveying our ideas concerning thoſe ſubſtances, the denominations of which have hitherto been the ſubject of this Eſſay.

It is very evident, that, in ſuch terms as approach near to common language, the philoſopher cannot plead an exemption from common forms. But as the abundance of new facts, and of new ſubſtances, have exacted that a

number of words ſhould be created, and that ſome old ones ſhould be received in a more extenſive ſenſe, it was neceſſary that both ſhould be reſtricted, by ſuch analogies, as might bring them to the generál ſtandard. In the formation of this new chemical language, very few alterations have been made in any of the old words; and no new ones have been created, except in caſes where new ideas required new ſymbols. To give an example; the word COMBUSTION is now received, in chemiſtry, in a more general ſenſe than formerly; and OXYGENATION is a new term, from the obſervation of a newly diſcovered fact.

In the conſtruction of new terms, a little more liberty has been taken; and, indeed, when the language of ſcience deviates from the language of the vulgar, the philoſopher does well to aſſert his right, and to ſecure his mode of expreſſion

expreſſion againſt the popular corruption, which muſt ever influence the terms of ordinary diſcourſe.

The greater part of theſe new expreſſions have been tranſlated into our language from the French. The advantages and the errors are, in ſome inſtances, common, although it muſt be confeſſed, that, in others, we have not choſen that mode of tranſlation, which would have been more congenial both to our language and to the principles of the ſyſtematic nomenclature.

The term COMBUSTION was formerly uſed to denote that change in a certain claſs of bodies, which was rendered ſenſible by an evolution of light and of heat. The burning of coals in our fire-places, for inſtance, was one of the principal operations of combuſtion. However, ſince the phænomena, that attend it, have been better underſtood,

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it has been received in a much more general ſenſe; and every caſe, wherein a body abſorbs oxygen, whether ſlowly or rapidly, has been termed combuſtion. It ſeems therefore, that the term has been extended from the ſpecies to the genus; and I do not think, that the language has acquired either force or preciſion from this liberty *.

COMBUSTION is, in fact, the combination of Oxygen with ſuch bodies, as are capable of combining with it. But there is a term in the French, and, from that, tranſlated into our language, which expreſſes the fact with greater

* In a paper, which the very learned editor of the *Bibliothéque Britannique* has tranſlated into his Journal, I have uſed the word COMBUSTION, in this general ſenſe. Mr. Pictet very properly objects to ſuch an application of it, and offers his reaſons on the ſubject. I have done little more, in this place, than develope the ideas of this author, which he could not do in the compaſs of a note.

propriety.

propriety. OXYGENATION * is a more congenial term to expreſs this operation. OXYGENATION (or better OXYGENIZEMENT) is more properly, than COMBUSTION, the act of combining OXYGEN with all bodies, by which it is attracted. This comprehends all the varieties of the fact, both as to modes and degrees. Whether the combination be performed rapidly or ſlowly, with the diſengagement of light and heat, or without any ſuch ſenſible effect, the term OXYGENIZEMENT expreſſes it clearly in the general ſenſe; and is not reſponſible

* I have hitherto, when ſpeaking on my own account, uſed OXYGENIZE and OXYGENIZEMENT; and ſhould have done ſo here, but that I am ſpeaking of the word, which *has been* adopted. I ſhall preſently ſtate my reaſons for the preference I give to OXYGENIZE and its derivatives. In the following ſentences, I have uſed OXYGENIZEMENT, both for the ſake of uniformity and propriety. It means the ſame as OXYGENATION.

for

for the mode or condition of the fact. Whether the result be an Oxide or an Acid, OXYGENIZEMENT ſimply ſtates the fact of combination, without entering into the queſtion of the effect, produced by the quantity. OXYGENIZEMENT ſeems to poſſeſs every quality of a generic term, and is well adapted to denote the fact in its moſt extenſive ſignification. But OXYGENIZEMENT is capable of being performed after two modes; and its reſult is alſo twofold. Either light or heat is emitted during OXYGENIZEMENT, or they are not emitted; and the reſult is either an OXIDE or an ACID. When light and heat are not emitted, the generic term muſt be uſed in a ſpecific ſenſe; and OXYGENIZEMENT is again the proper expreſſion. Thus the converſion of Sulphur into Sulphuric Acid, by the means of Nitric Acid (as was the caſe with what, in the paper alluded

to,

to, I had improperly termed COMBUSTION) is an OXYGENIZEMENT as to the mode; and the converſion of Sulphur into Sulphuric or Sulphureous Acid, in Oxygen Gas, being accompanied by the emiſſion of light and heat, although an OXYGENIZEMENT, with regard to the generic fact, is a true COMBUSTION as to the ſpecific mode.

In the ſame manner, the converſion of Phoſphorus into Oxide, as well as its converſion into an Acid, is an OXYGENIZEMENT. But although the fact be generic, the reſult is different; for, in one caſe, the ſpecific name, as to the degree or reſult, is an OXIDIZEMENT; in the other, an ACIDIFICATION. To give an example of the whole ſeries of expreſſions, we may take this combuſtible body, and ſay, The converſion of Phoſphorus into Phoſphoric Acid, by inflaming it in Oxygen Gas, is an OXYGENIZEMENT,

as to the generic fact; a COMBUSTION, as to the mode; and an ACIDIFICATION, as to the degree. And the formation of the ſame Acid, by means of Nitric Acid and Phoſphorus, is an OXYGENIZEMENT, as to the ſpecific mode, and an ACIDIFICATION, as to the degree. I know, that the term OXYGENIZEMENT being uſed, both in a generic and in a ſpecific ſenſe, is an objection to this ſeries. But I have mentioned it particularly, in order to expoſe the defects of Chemical Nomenclature.

For the ſame reaſon, I do not think that it is proper to term all metals COMBUSTIBLE bodies. Iron indeed is COMBUSTIBLE in Oxygen Gas, but it is little more than OXYGENIZABLE in Atmoſpheric Air. And the epithet, OXYGENIZABLE, is ſuited to all bodies, which do not emit flame and heat, during their union with Oxygen.

Throughout

Throughout this Eſſay, I have, when ſpeaking on my own account, and in my own name, made uſe of the word OXYGENIZE, and its derivatives, in preference to OXYGENATE, and its derivatives. I ſhall now ſtate my reaſons.

OXYGEN is of Greek extraction; and although it be fully naturalized, we cannot ſo far diſguiſe its origin, as to inflict upon it a termination, that ſhall make its progeny a hybrid. ATE is the termination, which we have generally given to words, derived from the Latin. We have, in Engliſh, 828 * words, terminating in ATE; and of theſe the greater number, whether originally Latin or not, have been received, by us, from that language. We have 122 words, terminating in ISE, and 106 in IZE. The greater part of them are of Greek extraction.

* Vide Walker.

The

The Greeks had a verb ὀξίζω or ὀξύζω, *Acidus ſum.* Therefore, we have fact as to the root of this very individual word. For theſe reaſons, therefore, OXYGENIZE is a preferable word to OXYGENATE, as the termination and the word are formed by ſimilar analogy.

Thus far to ſatisfy the mind of the ſcholar. But I confeſs, that, in ſcientific language, I ſhould not give myſelf much trouble to alter words to pleaſe the mere man of letters. There is another reaſon, in which I look for ſupport from every candid chemiſt. I have often had occaſion to remark in this Eſſay, that ATE is a termination, ſet apart for the purpoſe of deſigning the ſtate of the Acid, in Salts, formed by ſalifiable baſes, and any Acid, carried to its higheſt degree of OXIDIZEMENT. Thus Sulphate, Nitrate, &c. Every perſon, thoroughly impreſſed with

with the importance of principles in Chemical Nomenclature, muſt feel, how neceſſary it is, to avoid transferring to one order of facts or ſubſtances, the diſtinguiſhing feature of another. In the original introduction of the word, we were at liberty to uſe whatever term appeared the moſt appropriate to our language; and, even yet, the expreſſions of Chemiſtry have not ſo far ſubſided, as to have depoſited all their dregs. We may ſtill propoſe improvements, whenever an opportunity occurs, without incurring the danger of anarchy. And the word, I propoſe, as a tranſlation of *Oxygéner*, is, by no means, ſuch as can create confuſion; at the ſame time that I believe, the literary, and ſtill better, the ſcientific reaſons to be ſtrongly in favour of OXYGENIZE.

But it may be ſaid, "If we concede this principle, you will endeavour to extend

extend it:" and the literary man begins already to fear, that the chemiſt may incroach too far, and apply his rule of avoiding ſignificant terminations, to words that cannot be thus altered. In this caſe, the chemiſt muſt bend to cuſtom; and not attempt to innovate, where he has no more than the common ſhare of juriſdiction. When he adopts the terms of vulgar language, he muſt be contented to uſe them without alteration. If he ſays, that he has SATURATED an Alkali, he muſt not talk of SATURIZING; although he may, with propriety, make uſe of NEUTRALIZING.

I have no doubt, that the termination ATE, in our language, was cauſed by the French word *Oxygénation*, which was tranſlated OXYGENATION in Engliſh; and, from that, the verb OXYGENATE was naturally formed. But it does not follow, that the word, which

which may be proper in one language, is ſo in another. The verb of *Oxygénation* is *Oxygéner*; and there is no inconvenience in *Oxygéner*, nor indeed in *Oxygénation*. But our verb OXYGENATE being, as I before ſaid, improper, OXYGENATION muſt be ſo too; as it does not ariſe naturally from the verb OXYGENIZE.

In a paper, which had been read before the Royal Society, previouſly to the publication of the preſent Eſſay, I have made uſe of the term OXYGENIZED MURIATIC ACID. I was alſo under the neceſſity of adopting a term for another ſtate, in which I proved that Acid to exiſt; and as it was a ſtate of further Oxygenizement, I prefixed the Greek prepoſition *uper*, HYPEROXYGENIZED. I preferred the Greek to the Latin prepoſition, in order to ſerve the integrity of etymology. Since the

the reading of that paper *, this ſeries of termination in IZE has been adopted by very reſpectable authority; and we find it uſed by Mr. Howard, in his excellent memoir upon the mineral bodies which are ſuppoſed to have fallen on the earth.

The French have an advantage over us, by the uſe of two words in their language, which might be made to apply to different things: the words *Solution* and *Diſſolution*. In Engliſh, DISSOLUTION is never applied in a chemical meaning, although we uſe the verb DISSOLVE; and SOLUTION is the ſubſtantive, which correſponds to this verb. It is certain, that, in chemiſtry,

* I refer the reader to that paper for ſome obſervations upon what appears to me to be the moſt proper ſeries of denominations for the three known degrees of what is now called Muriatic Acid.

there

there are two functions of diſſolvents, and two kinds of ſolution. Thus Nitric Acid diſſolves both Silver, and the Oxide of Silver. But Silver, while it is about being diſſolved, receives from the Acid a new principle, which it retains, even though the Acid ſhould no longer adhere to it. The Oxide of Silver, on the contrary, receives no addition from the Acid; but, if this be taken away, the Oxide of Silver re-appears, as before its union with the Acid. We have therefore two very different actions, that conſtitute two different modes of ſolution, and which, if we would ſpeak more ſtrictly than in general terms, require to be diſtinguiſhed. In every caſe, where the nature of the ſubſtance diſſolved is changed by the diſſolvent, the fact ſhould be termed a diſſolution. Thus we ſhould ſay, "A DISSOLUTION OF SILVER IN NITRIC ACID." In every caſe, where no

chemical change is produced, the fact might be called a SOLUTION; as we ſhould ſay "A SOLUTION OF OXIDE OF SILVER IN NITRIC ACID." It was upon theſe grounds, that I objected, in an early part of this Eſſay, to an expreſſion in the tranſlation of Gren's Chemiſtry from the German. A SOLUTION OF CHALK is not an accurate expreſſion, according to theſe principles. It is not a SOLUTION OF CHALK, but a SOLUTION OF LIME in an Acid; for the Chalk, being Carbonate of Lime, is decompoſed, before it can be diſſolved in a ſtronger Acid; while the Lime is truly held in ſolution, if the Salt formed be ſoluble. Indeed I believe, that, upon any principles, a ſolution of Chalk, as uſed by the tranſlator of Gren, cannot be eſteemed accurate*. We will ſuppoſe, for inſtance, BORACITE to mean

* As the tranſlator of this work, rendered ſtill more uſeful by his notes, is a foreigner, he cannot be

BORATE OF LIME, as CHALK means CARBONATE OF LIME. If then the author had written a ſolution of BORACITE * IN NITRIC or MURIATIC ACIDS, it might not have been altogether ſo improper; for Lime will form a ſoluble Salt with either of theſe Acids; and Boracic Acid is very ſoluble in water. Hence SOLUTION, in its preſent ſenſe, had not been exceptionable. But Chalk conſiſts of Carbonic Acid and Lime. Suppoſing the Acid, which the tranſlator meant, to have been one of thoſe, which form a ſoluble Salt with lime, the Lime would have been diſſolved. But the Carbonic Acid, which can be diſſolved in water only, as 1 TO 112, muſt have eſcaped in the ſtate of Gas; therefore not only the Chalk was not

be offended at any remarks that regard the language as Engliſh.

* I uſe this term hypothetically for the preſent purpoſe.

diſſolved in the Acid, but not even the elements of the Chalk were preſent in the ſolution. The only ſubſtance we know of, which can hold Chalk in ſolution, is Carbonic Acid. SOLUTION OF SILVER is not ſo improper an expreſſion, as SOLUTION OF CHALK, or SOLUTION OF BORATE OF LIME, in Nitric or Muriatic Acid. For, in a ſolution of Silver, at leaſt, the metal has not been deprived of any of its conſtituent parts; but rather acquires than loſes. Although it be diſſolved with addition, it is diſſolved entire; whereas even Borate of Lime, when diſſolved in Nitric or Muriatic Acid, undergoes decompoſition; and its elements are held in ſolution, not as Borate of Lime, but as ſeparate elements.

I know very well, that the tranſlator has not uſed the exact expreſſion of a SOLUTION OF CHALK IN NITRIC OR MURIATIC ACID; but, from the

tenor of the phraſe, and the chemical principles it contains, it is evident, that he meant a ſolution of Chalk in ſome of the ſtrong Acids. I have quoted the ſentence at full length in Chap. III.

I have known great confuſion to ariſe from the indiſcriminate uſe of the words DETONATION, FULMINATION, DEFLAGRATION, and their analogous verbs. There is little or no real difference between DETONATION and FULMINATION; or rather FULMINATION ſeems to be a metaphorical term in this caſe, expreſſing nearly the ſame thing as DETONATION. But DEFLAGRATION is totally different. DETONATION and FULMINATION are accompanied by noiſe, and are inſtantaneous. DEFLAGRATION may be accompanied by noiſe, but not ſo quick or ſo loud; and flame is a quality, inſeparable from DEFLAGRATION. This

may be better explained by example. A mixture of Sulphur, Charcoal, and Nitre of Potaſh, DETONATES in cloſe veſſels. A mixture of Sulphur and Hyperoxygenized Muriate of Silver produces a violent DETONATION by very ſlight preſſure. Nitric Acid, poured upon Oil of Turpentine, DEFLAGRATES. Yet, I have heard this miſtake repeated through the whole courſe of a public and very elaborate lecture on exploding mixtures. Cuſtom ſeems to have eſtabliſhed a diſtinction between a FULMINATING and a DETONATING ſubſtance. Thus we moſt frequently hear of FULMINATING GOLD, of FULMINATING SILVER, of FULMINATING MERCURY. They are fulminating *per ſe*. But Gunpowder is a detonating mixture; and Nitre is a ſalt, capable of forming a detonating mixture. This application of the term is not, however, without its exceptions,

ceptions, as PULVIS FULMINANS; and ſeems rather founded upon habit, than upon the intrinſic import of the words.

Another impropriety, which we frequently meet with in French, and ſtill more, in Engliſh authors, is the uſe of epithets to deſign a pure and ſimple ſubſtance. Formerly no diſtinction was made between a ſimple and a compound, a pure or an impure body. It was indeed hardly known in what the difference conſiſted; and, although we cannot, even now, aſſert, that we have attained unqueſtionable knowledge, yet we are much further advanced than our predeceſſors; and as far as our knowledge does reach, or as far as we ſuppoſe it to reach, concerning the true nature of chemical bodies, we may adopt correct expreſſions.

To ſhow the uſeleſſneſs of epithets, I ſhall chooſe a term, which we ſeldom find uſed without that burden; and if I can ſhow that epithets are uſeleſs,

I ſhall by that prove them to be prejudicial; as more words than are abſolutely neceſſary tend only to overload diſcourſe. CAUSTIC POTASH, PURE POTASH, BERTHOLLET'S POTASH, POTASH PURIFIED BY ALCOHOL, are all uſed to denote POTASH. Potaſh, in the preſent ſtate of chemical knowledge, is a ſimple body; and, if prepared by proper methods, is a pure, homogeneous, uniform ſubſtance. It has the property of being cauſtic; and hence it bears the epithet.

But epithets are either expletives, or are uſed to ſpecify. In the latter caſe, they tend to mark a diſtinction, as it were, between that portion of the ſubſtance, to which they are prefixed, and another portion, which does not partake the quality they imply. Hence we might ſuppoſe, that there are two kinds of Potaſh, one cauſtic, and the other not. But cauſticity is a ſine quâ

non

non of Potaſh; therefore, in this ſenſe, the epithet CAUSTIC is ill applied.

Potaſh, as I have ſaid, is, when properly prepared, a pure and ſimple ſubſtance. It does not contain any heterogeneous mixture, and needs no epithet to deſign the abſence of any other body. It is, to all intents and purpoſes, POTASH. But there cannot be Potaſh purer than Potaſh, which contains nothing elſe. PURE therefore is tautology. BERTHOLLET'S POTASH, POTASH PURIFIED BY ALCOHOL, turn a little upon the ideas, that gave riſe to GLAUBER SALTS, SAL SILVII, &c. and ought not to be admitted in a philoſophical ſyſtem of language.

In Chap. III. I have rather anticipated what ſhould come with more propriety here; but I was deſirous to eſtabliſh this principle in as early a part of the work as poſſible. The term, which I then conſidered chiefly, was

REGULINE, as applied to metals. As it may not be ſuperfluous to extend the obſervation, I ſhall apply it, at preſent, more fully to the word I have juſt been conſidering.

The neceſſity of prefixing an epithet to POTASH aroſe from too general an application of the original word POTASH. Without mentioning the multitude of ſubſtances, deſigned by that word, in common language, it is uſed, in works upon ſcientific chemiſtry, to denote many, not one of which is POTASH, in its proper ſenſe. Lapis Cauſticus is one of thoſe ſubſtances. Dantzic and American Potaſh are called POTASH; and Salt of Tartar alſo is known by that name. Lapis Cauſticus is prepared by digeſting together a ſolution of Dantzic or American Potaſh, or of Salt of Tartar and Lime, waſhing the Lime well upon a filter, and evaporating the liquor. Then, in order

order to abſorb whatever Carbonic Acid might be attracted by the maſs, apothecaries add a little Lime. This is a very excellent precaution for chirurgical uſes, but renders the mixture totally unfit forchemiſtry. Lapis Cauſticus is indeed more impure than even Dantzic Potaſh, or than Salt of Tartar. Yet this ſubſtance, if it has never aſpired to the epithet of Pure, uſurped that of Cauſtic; and this is an honorable diſtinction among Alkalis. Dantzic Potaſh contains Sulphate, Muriate, and Carbonate, of Potaſh; Potaſh, which holds in ſolution Silica, Alumina, and Manganeſe. To theſe I may add Iron. Yet this ſubſtance is frequently termed Potaſh. Salt of Tartar contains nearly as many heterogeneous ſubſtances, but, if we except Carbonate of Potaſh, not in ſo large a proportion. The impropriety of applying the name of a pure and homogeneous ſubſtance to ſuch

impure and heterogeneous mixtures muſt be very ſtriking. However, that improper mode of expreſſion did exiſt; and from it aroſe the neceſſity of applying an epithet to the original word, uſed to expreſs the ſimple ſubſtance.

Beſides the impropriety in this point of view, I have, in Chap. III. given an example of the inaccuracies, that may ariſe from the indiſcriminate uſe of ſimple words to denote impure ſubſtances.

In the works of many authors, who have fully adopted both the new theory and the new nomenclature, we find, that the new terms are not invariably uſed; and the apparent contradiction, in the principles and the practice of thoſe chemiſts, is not qualified by any palliative phraſe. Monotony ſhould be avoided in writing; and ſtyle will be rendered more agreeable by variety of expreſſion. The remembrance of the

old

old terms too will, by this means, be awakened in the mind; and the apprehenſion of their becoming obſolete will be removed, by our meeting with them occaſionally. However, an immoderate uſe of the antient chemical terms implies, at beſt, but a partial approbation of the new; and, if authors were to perſevere in the practice, the new terms, rather than the old, ſhould excite our fears for their becoming obſolete. As I have already ſaid, and will repeat, that there are certain advantages attending the occaſional introduction of the terms, I ſhall not be ſuſpected of partiality, if I offer the following reſtrictions, to put chemiſts on their guard againſt their frequent repetition.

The old terms ſhould never be uſed, except in quoting an author, who formerly uſed them; or, if in an original work, to avoid repetition.

It ſhould always appear moſt clearly, that they are uſed with the conſciouſneſs of their being old terms; and they ſhould be accompanied by a palliative phraſe, to ſignify, that they are not in thorough eſtimation. With theſe precautions, they may be ſometimes introduced with advantage.

Orthography and Orthoepy are no inconſiderable parts of language. And although philoſophers may be contented with expreſſions, that are merely accurate, they are not to neglect any thing, that can confer a grace upon their language. Dr. Pearſon has ſo well pointed out the moſt uſual errors of this kind, that I ſhall follow his liſt of words; and muſt add the reaſons, which have led me to the mode of writing or pronouncing, which I propoſe.

CALORIQUE, for CALORIC, is French, and not required by any neceſſity, that I can diſcover.

OXIGEN*, OXIGENE, OXYGENE, for OXYGEN. This word is derived from the Greek οξυς and γενομαι; U is repreſented in modern languages by Y. The French go ſo far as to call the latter the GREEK I. As to the omiſſion of the E, at the end of the laſt ſyllable, I am not quite ſo ſatisfied. I ſhall expoſe my doubts in ſpeaking of another termination.

The ſame obſervations apply to HIDROGEN, and HIDROGENE, for HYDROGEN.

OXID, OXYDE, OXYD, are improper for OXIDE. This word is derived from οξυς and ειδος. It is therefore Oxide: the laſt ſyllable of the former word being omitted, the ε of the ſecond ſyllable is ſuppreſſed; but, as Dr. Pearſon properly

* I am ſorry to find that I do not agree with Mr. Nicholſon, who generally uſes the I inſtead of the Y.

obſerves,

obſerves, might have been allowed to remain.

AZOT for AZOTE is alſo faulty.

The author of the chemical part of the Encyclopædia Britannica ſays, that he has written SULPHAT, NITRAT, MURIAT, &c. inſtead of SULPHATE, NITRATE, MURIATE, &c. becauſe he thinks, that the omiſſion of the E makes the ſound of the A more congenial to the Engliſh language. I am ſorry to differ from this author with regard to his mode of orthography. Engliſh is perhaps the only language, in which the long ſlender ſound of A is inherent and natural. I mean the ſound, produced by a ſilent E at the end of the ſyllable, as in HATE, FACE, DARE, &c. Dr. Johnſon, in the ſhort grammar, prefixed to his dictionary, ſays, that Erpenius, in his Arabic Grammar, very juſtly calls this ſound A Anglicum cum E miſtum,

as

as having a middle ſound between the open A and the E. If the word be written SULPHAT, and if the accent be thrown upon the ſecond ſyllable, it muſt be pronounced Sulphát, and we ſhall have the ſhort ſound of the Italian A, as in FAT, HAT; which is the very reverſe of the true Engliſh A. The one is long and ſlender; the other, ſhort and broad. If the accent in SULPHAT be laid upon the firſt ſyllable, the A in PHAT hardly retains the force of A, but ſeems to aſſume a peculiar ſound*. If

* I have often been aſtoniſhed that this ſound, which recurs ſo often in Engliſh words, has not been noticed by any even of our late Orthoepiſts. Mr. Walker, who has given many delicate ſhades in the ſound of this vowel, has not noticed this particular one. In the word CRAVAT, for inſtance, he gives the 4th ſound of A to the A in the ſecond ſyllable, as, FAT; but he could do no more, were the accent on the 2d ſyllable. However, a delicate ear will perceive a difference in the latter A, when the accent is placed on the firſt, and when it is placed on the latter ſyllable.

the

the accent be laid upon the 2d ſyllable of SULPHATE, then the A enjoys the full privilege of its Engliſh origin. If the accent be placed on the firſt ſyllable, the ſound of the A in the ſecond ſyllable is a little modified, but ſtill it is radically the long ſlender ſound. If it be not pronounced quite ſo long as in FACE, it will have the force of the A in DEDICATE, or, at leaſt, of that in DELICATE*. Therefore, in itsuſual and proper mode of pronunciation, which is SULPHATE, the ſound of the A, followed by a ſilent E, at the end of the ſyllable, is much more congenial to the Engliſh language, than when it is omitted.

For a ſimilar reaſon, I would contend for the final E in AZOTE; and I am not very certain, whether that of

* Theſe diſtinctions are extremely well pointed out by Mr. Walker, in his Principles of Engliſh Pronunciation, prefixed to his Dictionary.

HYDRO-

HYDROGEN ſhould not be preſerved. However in words, which terminate in ENE, the laſt is always the accented ſyllable. We have but two exceptions in Engliſh, DAMASCENE and GANGRENE. Whereas all words, ending in EN, preceded by a conſonant, are accented on the firſt ſyllable. AMÉN and ÁGÉN are the only exceptions. As the word is HY'DROGEN, and not HYDROGE'N, there may be leſs reaſon for preſerving the final E, than for preſerving that in SULPHATE and in AZOTE.

Dr. Pearſon prefers to write the word GAS, inſtead of G AZ; andadds, that it is on account of a word in the French language, pronounced as GAS would be in French, that the French have adopted the z, inſtead of the s, in their word GAZ. This other word Dr. Pearſon does not mention; but ſays, in another place, that it has a very indelicate meaning.

The

The only word, which at all comes under this deſcription, is GARCE, the ſignification of which is not indeed very delicate. But as to the pronunciation, I muſt differ from the Doctor. The Engliſh, in general, do not, in ſpeaking their own language, lay the ſame ſtreſs upon the letter R, or pronounce it with ſo much vehemence, as the French. And few perſons acquire the delicate ſhades of pronunciation in any foreign language. The E muet is one of the characteriſtic features in the peculiar pronunciation of the French; and which, in the mouth of a native, contributes much to the variety and perſpicuity of the language. It is even one of the fundamental ſources of harmony in French verſification; and a ſound which, when uttered as it ſhould be, deſtroys the monotony, that prevails in French poetry, when ſpoken by any but a well educated Frenchman. Making theſe

two

two deductions from the lawful pronunciation of the word GARCE, we ſhall have a ſound, rhyming nearly with our word PASS, as GASS This indeed is not unlike what would be the French mode of ſaying GAS. But then it is the Engliſh, and not the French, pronunciation of GARCE; ſo that it cannot ſupport Dr. Pearſon's argument with fairneſs. I believe the French write GAZ, becauſe they ſuppoſe it to be the manner, in which it was written by the firſt, who uſed the word.

Throughout this Eſſay, I have particularly avoided introducing any new name, or pointing out any word, that might be adopted to denote any of thoſe ſubſtances, which I have thought not to bear ſuch denominations, as the ſyſtem would have given to them in its ſtricteſt ſenſe. Indeed, when I have taken notice of faulty appellations, I have never

never ſuggeſted a change, unleſs where the rules themſelves moſt ſtrikingly pointed out the appropriate term. I do not think it in the power of any one man to embrace the whole ſyſtem with equal clearneſs; nor, if it were in his power, has he a right to propoſe to the reſt of the learned world a vocabulary of his own invention. We cannot hope, that a ſyſtem of names will be adopted, unleſs it bears the ſtamp of weighty authority, and the approbation of reſpectable numbers. It was not without difficulty, that the nomenclature of Lavoiſier gained ground; and an attempt to improve it might yet meet with oppoſition. When it was propoſed, a great change had taken place in philoſophical opinions; and, before the minds of men were fixed, as to their chemical tenets, thoſe, who were inclined to the new theory, embraced the new nomenclature. Improvements have been

gradual ſince that time, and therefore leſs perceptible, unleſs by an hiſtorical retroſpect.

Some will think it ſtrange to hear it aſſerted, that the nomenclature, in its preſent ſtate, does not accompliſh much more than half the object originally intended. However, this is rigidly true; for the improvements in nomenclature have not kept pace with its wants. It has remained ſtationary in ſome caſes; has been retrograde in others; but, in all, has been outſtripped by the rapidity of diſcoveries.

Chemiſtry is now in a ſtate, that demands a reviſion of the nomenclature. Diſcoveries have been made, and frequently their authors have not known how to name them. The new theory has been proved; and its principles have been found good. The object therefore, in ſuch a reviſion, would be to eſtabliſh and extend the principles in a

manner

manner, that would leave no room for arbitrary nomination.

For this purpoſe, a ſelect number of chemiſts ſhould be deputed with full powers. It would be of little conſequence in what language the terms ſhould be originally propoſed; as the very firſt idea of the new nomenclature is, that it ſhould be taken from a dead language, in order to render it univerſal; and ſubject, not to capricious change, but to modifications, founded upon reaſon.

The perſons choſen ſhould be chemiſts; chemiſts in the ſtricteſt ſenſe of the word; perſons, who every day find the advantages of the preſent nomenclature, and who every day feel its imperfections. It is not very neceſſary, that they ſhould have read Condillac or other authors, who tell us why we make uſe of words. If they are men of letters at the ſame time that they are chemiſts,

chemiſts, it may, in ſome reſpects, be uſeful. But, above all, let them not be men of letters, ignorant of chemiſtry. In the nomenclature of a ſcience, it is not the taſte of the literary man, but the wants of the philoſopher, that are to be conſidered. The latter is to be the creator and the regulator of the language; the former may be conſidered as little more than a living lexicon, and a living proſody. The philoſopher is to have unbounded juriſdiction as to the fabrication of derivatives; but the man of letters is to check him, if he would attribute to an original word an import, different from the true ſignification. The philoſopher can aſſume no right to tranſlate ὀξυς by ſweet; and the man of letters muſt not be diſcontented, if, in ſome few terms of a ſyſtematic ſeries, euphony is a little diſregarded to preſerve the ſymmetry of principles. The utmoſt that can be allowed to the ſcho-

lar is to propoſe a term, if he be called upon ſo to do; but approbation or rejection, without appeal, belongs to the philoſopher.

In the formation of thoſe terms, which are not common both to chemical and vulgar language, the philoſopher has ſcope for improvement. He may ranſack the dead languages with freedom, and bring again into uſe the terms, employed by Greek and Roman ſages. It is a contribution which they owe him, and which, he would be in fault, if he rejected. The dead languages are a permanent key, which equally, in every country, opens to the poſſeſſor the entrance to whatever is learned in ſociety; and, before the ſtudy of ſcience, the *Literæ Humaniores* have ſmoothed every difficulty, that could render Greek or Latin an objectionable ſource of philoſophic language. So far from throwing ridicule upon the French Ne-

ologiſts, for having derived the greater part of the new terms from Rome and Athens, we muſt confeſs, that they have ſhown great judgement, and unuſual impartiality, in turning to languages ſo generally underſtood. I repeat impartiality; and I might add complaiſance; for, their own language being the moſt generally ſpoken of the living languages, they might have pleaded its univerſality, in favour of any terms which it might have afforded, or which they might have propoſed. This mode of proceeding might, in ſome very ſlight degree, have facilitated the ſtudy of chemiſtry in France; but other nations would have been excluded from the benefits of the nomenclature. Although the introduction of new terms, particularly if they are a little different in ſound from thoſe, to which we have been accuſtomed, be hazardous, yet novelty is an objection, which

every day diminiſhes. There are few words, which, after being ſome time tolerated as aliens, don ot render themſelves ſo uſeful in a language as, at length, to become naturalized in their own right. In ſuch words or names, therefore, as are peculiar to chemiſtry, I would have the chemiſt know no juriſdiction above his own. And the only reſtriction I would lay him under is, that he ſhould uſe the radical words, already exiſting, in their preſent ſignification; but I would leave him abſolute, as to the ſuperſtructure of his chemical ſeries.

On the other hand, it is very evident, that, in ſuch terms as approach the neareſt to common language, the philoſopher cannot plead an exemption from common forms. He muſt take but ſmall liberties in the adoption o new words, which are not, or may not be ſanctioned by general uſe, and muſt

not

not alter thoſe already adopted in his language.

One of the principal charges againſt the preſent names, taken individually, is the uncouthneſs of their ſound, together with a general diſregard to euphony. But this objection will admit of two anſwers.

In the firſt place, it may be worth conſidering what is the attention, which euphony deſerves in a ſyſtem of ſcientific nomenclature. In the next place, of all the ſciences, which derive their names from the dead languages, chemiſtry is that, which has introduced the ſmalleſt number of ill-ſounding terms; and it is by no means certain, that the antient nomenclature was not ſtill more cacophonous.

To decide upon the firſt of theſe points, it will be neceſſary to conſider the object of the preſent chemical no-

menclature, and the principles on which it is conſtructed.

The leading principle, upon which the preſent ſyſtem of chemical nomenclature is formed, is ſuch a connection between the nature and the names of ſubſtances, that, as ſoon as the one is known, the knowledge of the other muſt follow. Not only the name of the ſubſtance, taken individually, muſt correſpond with its nature; but the relation of all bodies, one to the other, muſt be clearly pointed out in a luminous ſeries of words, derived from the radical term, and dependent on the changes of ſupercompoſition of the radical ſubſtance. Thus OUS, for the firſt degree of acidification; IC, for the ſecond; ITE, for the ſalts formed by the former acid; ATE, for thoſe formed by the latter; URET, for the combination of combuſtible bodies, one with

the

the other, &c. are the appropriate diſtinctive terminations of the changes, through which a ſimple acidifiable radical may paſs. The object of this and ſimilar ſeries is to facilitate the ſtudy of the ſcience; and I have related, in Chap. VIII, the obſervations I had an opportunity of making as to their ſucceſs. This language then is deviſed for chemiſts; is to be ſpoken by its profeſſors; is not only to be intelligible, but even ratiocinative, to ſtudents. It is not a language for poets or muſicians; it is not to be moulded into metre, or tortured into ſong. A little cacophony may therefore be tolerated by philoſophers, in favor of perſpicuity. And, as to the opinion of the world, I do not ſuppoſe, that any perſon was ever yet diſcouraged from the ſtudy of chemiſtry, by the harſhneſs of its new names.

Yet philoſophers themſelves are, in ſome caſes, inclined to pay too much at-

tention to euphony. There are a few terms, which, in the French ſyſtem, deviate a little from rule. I ſhall give one or two inſtances, not becauſe I wiſh on my own authority to ſupport the adoption of cacophonous words, though truly ſyſtematic, but becauſe I think it fair to ſtate, that ſome attention has been paid to euphony.

URET is the termination, uſed to denote the combinations of ſimple combuſtible bodies. Therefore CARBURET is the combination of Charcoal with a combuſtible body. PHOSPHURET, that of Phoſphorus. Theſe terms, as I before obſerved, are contractions of CARBON-URET, PHOSPHOR-URET. — HYDROGEN is capable of entering into a combination ſomething ſimilar; as is alſo NITROGEN. Thus Ammonia is a combination of Hydrogen and Nitrogen. If the principles of the nomenclature had been followed in this inſtance,

ſtance, Ammonia would have been termed either HYDROG-URET OF NITROGEN, or NITROG-URET OF HYDROGEN.

In another caſe, Hydrogen can combine with Sulphur in two different degrees, and both theſe combinations of Hydrogen and Sulphur can unite with Earths and Alkalis. SULPHURETTED HYDROGEN is the name, by which one of the combinations of Sulphur and Hydrogen is properly deſignated. HYDROGURETTED SULPHUR is the legitimate denomination of the other. The former of theſe, combined with an alkali, as Potaſh, for example, is SULPHURETTED HYDROGURET OF POTASH. That of the latter is HYDROGURETTED SULPHURET of Potaſh. And this is the ſeries of names, which I declined mentioning in Chap. VIII, till I had offered a few reflections upon euphony. The

term HYDRURET is totally improper for reaſons already expoſed.

HYDROGURETTED SULPHURET is certainly an unwieldy ſound, perhaps the moſt uncouth of the nomenclature; but I do not contend, that it is not cacophonous. I ſay, that it is the name pointed out by the principles of the ſyſtematic nomenclature.

Yet, if we examine the terms of the other ſciences, we ſhall find them to be even leſs melodious; and certainly not more ſignificant or juſt. In Medicine, the claſs Pyrexia, order Phlegmaſia, many of the names of which end in ITIS, is the only attempt at regular nomenclature. Although it be methodically arranged, the names of the ſpecies and varieties are not remarkable for their harmony of ſound; and this claſs is, by no means, the leaſt offenſive for the harſhneſs of its names. In Anatomy,

the

the STERNO-CLEIDO-MASTOIDEUS is one of the beſt named muſcles of the human body; but no perſon will ſay, that the ſound is more melodious than any of the chemical names.

The Greek terms in the Mathematics are full as refractory to the organs of ſpeech; and the foreign terms of the Law are not leſs inharmonious, though much leſs intelligible, than the moſt uncouth of the Chemical Nomenclature.

Upon the whole then, I think that the imputation of cacophony is ill-founded; that euphony is a much leſs important object, in a ſcientific language, than preciſion and ſyſtematic connection; and that perhaps it had been better for Chemiſtry, if, in the conſtruction of the new nomenclature, the rod of its tutelary deity had, a little oftener, put to ſleep the god of the lyre.

CHAPTER X.

ON THE SYSTEM OF CHEMICAL SIGNS.

MATHEMATICIANS and aſtronomers have derived great benefit from a ſyſtem of language, underſtood by the learned in all nations. And chemiſts have found it convenient, for the purpoſes of univerſal communication, to denote, by certain ſigns independent of language, the ſubſtances upon which they operate. The advantages of overcoming the obſtacles, ariſing from diverſity of tongues, muſt be evident to all. I ſhall not therefore attempt to point them out at length; but ſhall proceed to conſider the principles, according to which the new ſyſtem of chemical ſigns appears to have been formed; and then, to mention ſome inſtances, in which

which authors, who have publiſhed upon the ſubject, have deviated from the rules, laid down by Meſſrs. Haſſenfratz and Adet.

The principles of the ſyſtem of Chemical Signs are more ſimple and conſtant, perhaps, than the principles of Chemical Nomenclature. But many of the obſervations I have offered upon nomenclature may be applied to the preſent ſubject. However, it will be neceſſary to follow another order of arrangement, to place all the ſubſtances in their moſt diſtinct point of view.

It may be conſidered, that there are ſix radical ſimple ſigns, and but ſix, to expreſs the whole ſum of chemical compounds. To enable me to trace them in their ſeveral modes of combination, I will conſider theſe as ſix genera, and conſider the ſpecies as I proceed.

I.

The firſt genus is a zigzag line, and is uſed to denote Light  . This genus contains no ſpecies. By this I do not mean to ſay, that the ſign is not capable of being diverſified into ſpecies, but that, as yet, there has not been a neceſſity to do ſo in chemical uſes.

II.

The ſecond genus is a ſtraight line, and comprehends three ſpecies, which are particulariſed by the direction of the line.

1ſt Species, a ſtraight perpendicular line; Caloric | .

2d Species, a ſtraight horizontal line; Oxygen —.

3d Species, a ſtraight line, inclined from right to left, at an angle of 45°; Azote /.

This genus is not very methodical, as to the nature of the chemical bodies it contains.

III.

The third genus is a creſcent. It comprehends four ſpecies.

Firſt Species. Creſcent, with the horns inclined towards the right hand, Carbone .

Second Species. A creſcent, the reverſe of the former, Hydrogen  .

Third Species. A creſcent, with the points upwards, Sulphur  .

Fourth Species. A creſcent, the reverſe of the latter, Phoſphorus  .

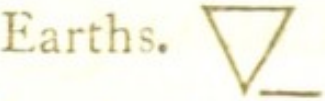
Theſe are the four ſimple combuſtible bodies. A creſcent, therefore, is the generic ſign of a ſimple combuſtible body.

IV.

The fourth genus is a triangle. It comprehends the ſimple unmetallic ſalifiable

lifiable baſes; and contains two ſpecies, each of which is again ſubdivided.

Firſt Species. A triangle, with the point upwards, and the baſis horizontal, the Alkalis, Potaſh and Soda  .

Second Species. A triangle, the reverſe of the former, the Earths. 

But this genus is not like the former genera. This ſign would have been left imperfect, if the individuals had not been pointed out. For this purpoſe, the initial letter of the name of the individual is inſerted in the centre of the ſign; and, that this may not be excluſively confined to any one language, it has been propoſed to inſert the initial letter of the Latin name. It is alſo a rule, that when the individuals of the ſame ſpecies begin with the ſame letter, the firſt letter of the ſecond ſyllable ſhall be added. This indeed would be a good precaution in all caſes. Thus we

ſhall

ſhall have as individuals of the firſt ſpecies, Potaſh  Soda  . Of the ſecond ſpecies, Barytes  Strontia  Lime Magneſia  Glucine  Gadolinite  Aguſtine if it exiſts  Alumina  Zirconia  Silica  .

V.

The fifth genus is a circle; and the diſtinction made, by inſerting the initial letter, as in the laſt genus, being properly the mark of the individual, this genus does not contain any ſpecies; for, in this genus, there is no other diſtinction. The individuals are 22 in number; and are expreſſed in the following manner: Gold  Platina Silver Mercury Copper Iron

Lead

Lead (Pb) Tin (Sn) Zinc (ℨ) Antimony (Sb) Biſmuth (B) Cobalt (Cb) Nickel (Nk) Manganeſe (Mg) Uranium (Ur) Titanium (Tt) Tellurium (Tl) Chromium (Cm) Arſenic (As) Molybdena (Ml) Tungſtein (Ts) Columbium (Cl)

VI.

The ſixth genus is a ſquare, and contains two ſpecies.

Firſt Species is a ſquare, with two lines horizontal, and two perpendicular: thus □. It contains all the unknown acidifiable baſes, and the individuals are marked, as in the former caſes, by the inſertion of the Latin initial. Thus Muriatic radical [M] Boracic radical [Br] Fluoric radical [Fo]. The Vegeta-

ble

ble radicals, though not poſitively unknown, are expreſſed in this manner, becauſe they have not yet been claſſed and arranged.

Second Species is a ſquare, with one point above, another below, and one on each ſide: thus  . The individuals are that entire ſet of bodies, called by Fourcroy *Matériaux immédiats*, whether animal or vegetable. They are marked, as exemplified above. Thus Alcohol  Ether  Oil  Gelatine  Albumen . Upon all the above genera, I muſt remark, that they are not arranged according to the exact nature of chemical bodies; for we find included, in the ſame generic ſign, ſome ſubſtances, ſuch as Caloric and Oxygen, which have no ſimilarity in their nature. But this rather belongs

to

to critical obſervations upon the principles of chemical ſigns, than to a developement of them. It muſt be remarked too, that the ſigns are not made to undergo all the changes, of which they are capable. The uſes of chemiſtry have not yet required, that ſo much extenſion ſhould be given to the variety of their poſſible expreſſions.

The above rules being well underſtood, it will appear, that, with ſix generic ſigns, we can expreſs all the ſimple ſubſtances in nature. But if we can expreſs all the ſimple bodies, of which compounds are formed, we can, by the union of the ſimple ſigns, expreſs all the poſſible unions of theſe ſimple bodies. Thus, with ſix ſigns, we have all that is neceſſary to expreſs every chemical body, whether ſimple or compound, that art or nature can produce. In this point of view, the

new

new chemical ſyſtem of ſigns is one of the moſt complete ſyſtems of language, that ever was imagined.

If theſe ſigns are become thoroughly familiar, it will be eaſy to combine them as we pleaſe. Having given rules for the ſimple ſigns, I ſhall give ſome principles and ſome examples of the modes of combining them.

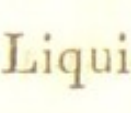
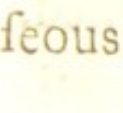
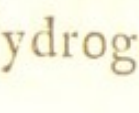
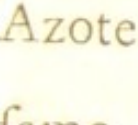
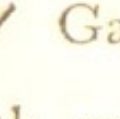
There is no ſubſtance, that cannot unite with Caloric. But moſt ſubſtances combine with it in ſuch a manner, as to undergo a change in their appearance and conſiſtency: as, Solid, Liquid, and Gaſeous. There are three ſtates, therefore, and it is neceſſary that all be ſeparately pointed out. When a ſubſtance is in the ſtate of ſolidity, it is not ſuppoſed neceſſary, that the preſence of any quantity of combined caloric ſhould be manifeſted *. Therefore

* The poſitions are not meant chemically ſpeaking; but are aſſumed, merely for the purpoſe of explaining the chemical ſigns.

none

none is expreſſed in the ſign, that denotes the ſubſtance. Thus the ſtraight horizontal line denotes Solid Oxygen ———. In the Liquid, and in the Gaſeous ſtate, the portion of combining Caloric has produced an effect, in changing the ſtate of the ſubſtance from ſolid to liquid, or to gaſeous; Caloric muſt therefore be expreſſed. Thus two lines will expreſs Caloric and Oxygen. But there muſt be a diſtinction between the quantities of Caloric preſent in every caſe. For this purpoſe, the rule is, that the greater quantities ſhould always be placed in the lower poſition, and the ſmaller quantity in the higher. The ſtraight horizontal line, with the perpendicular above it, at one end, expreſſes Liquid Oxygen: thus |—. And with the perpendicular below it, thus ⌜— it expreſſes Oxygen Gas. The ſame rule prevails for all ſubſtances. Thus we have Hydro-

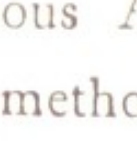
gen

gen  Liquid Hydrogen  Gaſeous Hydrogen  Azote  Liquid Azote  Gaſeous Azote  and the ſame with every ſubſtance in nature. Thus far then we have the ſtates, in which bodies are capable of exiſting, or the binary compound of ſimple ſubſtances with Caloric.

But combuſtible bodies can combine with Oxygen, and there muſt be a ſign to expreſs the reſult. Thus Hydrogen can become an Oxide of Hydrogen, and Sulphur can become acidified in two degrees. In general, when a ſubſtance combines with a ſmall proportion of Oxygen, the reſult is an Oxide; and this is the firſt degree of combination with Oxygen. The ſecond degree is an Acid, but not yet carried to its maximum, and the third degree is generally reckoned the ne plus ultra. Thus

we

we have Sulphur, Oxide of Sulphur, Sulphureous Acid, and Sulphuric Acid. But all theſe degrees muſt be marked. In the former caſe, the greater quantities always occupy the lower place, and this may be taken as a rule without an exception. Thus then we ſhall have, firſt, Sulphur ◡; and Oxygen ——; which, united in the firſt degree, form Oxide of Sulphur ◡‾. In the ſecond degree, we ſhall have Sulphureous Acid, which is marked by putting the ſign of Oxygen half way between the Oxide and the Acid in Ic: thus ◡–. And laſtly, we ſhall have Sulphuric Acid ◡⟋. But theſe three combinations of Oxygen with Sulphur may exiſt in three ſtates, as other bodies, Solid, Liquid, and Gaſeous; and theſe ſtates are to be marked in compound as in ſimple bodies. Liquid Sulphuric

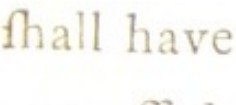
phuric Acid will be marked thus 
Liquid Sulphureous Acid, thus 
and the Gaſeous Sulphureous Acid, thus  . We have no method of marking triple compounds but by a threefold union of the ſimple ſign.

But acidifiable bodies, when united to Oxygen, combine with Earths and Alkalis, and form Salts. Theſe therefore muſt be marked, and we ſhall have a quadruple combination of ſigns. Sulphate of Potaſh is a combination of Sulphur and Oxygen with Potaſh; and, if we ſuppoſe it to be in fuſion, we muſt expreſs Caloric, as united to the whole. Potaſh is a triangle, with the point upwards, and the Latin initial in the centre; Sulphur, a half moon open above; Oxygen, a horizontal ſtraight line. Its place for the Acid in a Sulphate being the Acid in 1c, is below. Therefore, thus combined, we ſhall

have  and the ſtate, with regard to Caloric, is Solid as above; or Liquid  ; or Gaſeous  .

The Metals can be either in the metallic ſtate or oxidized. The ſimple circle is the generic ſign, with the Latin initial for the individual. But if oxidized, they aſſume the ſign of Oxygen in the ſame manner as the other oxidizable bodies. Thus Oxide of Silver (Ag). But ſome of the Metals are capable of two or three degrees of oxidizement. And here the Chemical ſyſtem of ſigns is deficient. But of this I ſhall ſpeak preſently. The Acids can be well marked thus: Arſenious Acid (which ſome call the white Oxide) (As)— Arſenic Acid (As) And theſe Acids can be marked in union with the ſalifiable baſis, whether metallic or not.

Arſeniate

Arſeniate of Potaſh  Arſeniate of Lead  both in the ſolid ſtate. If we ſuppoſe Arſeniate of Mercury in the act of being volatilized, we ſhall have  . The Oxygen is not expreſſed in the Metallic Oxide for the ſame reaſon as that, mentioned in ſpeaking of SULPHATED OXIDE OF IRON, Chap. III.

Beſides the Acids, which reſult from the combination of the four ſimple combuſtible bodies above mentioned with Oxygen, there are others, which, in judging from their properties, we likewiſe allow to be Acids. By reaſoning from analogy, we ſuppoſe them to contain Oxygen, and imagine, that they muſt be the reſult of a combination of that ſubſtance with a radical, of whoſe nature we are ignorant. We cannot expreſs, by a definite mark, a ſubſtance which we do not

know; therefore an indefinite ſign has been adopted as a general expreſſion for an unknown acidifiable radical. This ſign is a ſquare, with two ſides perpendicular, and two horizontal. The ſtate of ſaturation, in which we ſuppoſe the body to exiſt, with regard to Oxygen, is denoted by the poſition of the ſign of Oxygen, and after the uſual method. Thus, an unknown radical, acidified as an Acid in ous, is marked by a ſquare, as above deſcribed; the Oxygen is placed half way down one of the perpendicular ſides, thus  and the initial letter is inſerted in the ſquare. Such are Tartarcous  and Acetous Acids  . An unknown radical, forming an acid in ic, is marked by the ſquare, and the Oxygen at the bottom, with the Latin initial. Thus Muriatic Acid  Oxygenized Mu-

riatic

riatic Acid has uſually been marked thus $\boxed{\text{M}}$. And I have uſed the following ſign for Hyperoxygenized Muriatic Acid $\boxed{\text{M}}$ But theſe ſigns are not ſtrictly within the principles of the ſyſtem. They are anomalies, and muſt remain ſo, till the chemical world ſhall have pronounced upon the queſtion I propoſed in a paper upon that ſubject, in the Philoſophical Tranſactions for 1802.

It is almoſt uſeleſs to ſay, that all theſe ſubſtances can combine with Caloric, with the Earths, Alkalis, Metallic Oxides, &c. and that the combination of the ſigns affords the means of marking every poſſible combination of the ſubſtances.

But Acids may combine with the ſalifiable baſes in different degrees, and produce Salts, that have either acid or alkaline properties. From what has been ſaid

in a former paragraph, it is eaſy to learn the method of marking each ſtate of ſaline bodies: viz. whichever of the ingredients predominates, is to be placed under the other; and the other ſupercompoſition is to be marked in the uſual manner. Thus Supertartrite of Potaſh  Subborate of Soda  .

The ſpecies of this laſt genus are very numerous. All the poſſible vegetable productions, which are not ſimple bodies, are included therein; and there is no ſaying what extenſion may one day be given to theſe ſpecies. Theſe ſigns are ſubject to all the laws, laid down for the preceding genera of the chemical ſigns.

If the ſix ſimple ſigns are made familiar to us, and if the rules for combining them are well underſtood, there can exiſt no chemical compound, of which we have not immediately the correſponding mark.

In

In giving the above ſtatement and diviſion of the ſyſtem of chemical ſigns, I have differed from the order, in which it has been preſented by Meſſrs. Haſſenfratz and Adet; and I ſhall now ſtate my reaſons.

It is eaſy to perceive, that it was not the intention of the authors, who gave rules for theſe ſigns, to make a ſcientific arrangement of chemical bodies, according to their nature. It muſt be confeſſed, however, that if a little more attention had been paid to ſuch a mode of diſtribution, the ſyſtem had been more correct. Thus we ſee Caloric, Oxygen, and Azote, in the ſame genus of ſigns; and to them Meſſrs. Haſſenfratz and Adet have added Light. And this *right* line (which, by the by, is *crooked* — or wavy for one ſpecies of this genus) they ſay is the generic mark for the firſt claſs of ſubſtances, or ſuch as enter into the greater number of compoſitions. This

indeed is a ſtrange, vague manner of defining a philoſophical claſs of ſubſtances. Thus Light and Azote are ſaid to enter into the greater number of compoſitions; as alſo Caloric and Oxygen. But there is not the ſmalleſt analogy between Azote and Light, or between Oxygen and Caloric; and it is ſuppoſed that Light and Caloric, if they do exiſt as ſubſtances, are contained both in Oxygen and Azote. But even Oxygen and Azote have no analogy of properties. And it ſeems, that the vague deſcription of this claſs, mentioned above, has ariſen from the authors having brought together a heap of heterogeneous ſubſtances, which could not bear any common definition or deſcription. Light and Heat indeed, if they are to be conſidered as ſubſtances, may be claſſed under the head of Imponderable Subſtances, which enter into the greateſt number of compoſitions.

Oxygen

Oxygen is the comburating ſubſtance; therefore it cannot be claſſed with Azote, which, if not a combuſtible, is an oxygenizable, acidifiable radical; for we have Nitric Acid, as it is called, which is as much the Acid of Azote, as Sulphuric Acid is the Acid of Sulphur. I ſhould have preferred putting Oxygen by itſelf, and claſſing Azote with Carbone, Hydrogen, Phoſphorus, and Sulphur, as a genus of Oxygenizable bodies. Of theſe again I ſhould have made two diviſions and one ſubdiviſion. Thus,

OXYGENIZABLE.

Oxygenizable.	*Combuſtible.*	
Acidifiable.	*Acidifiable.*	*Oxidizable.*
Azote		
	Carbone	Hydroge
	Phoſphorus	
	Sulphur	

And the ſigns ſhould have taken their

forms according to this diviſion of the ſubſtances.

But, at all events, ſuppoſing the form of the ſigns to be altogether capricious as to their following, or not following a ſcientific diſtribution of the ſubſtances, I cannot ſuppoſe, that a ſtraight line and a crooked one bear ſufficient reſemblance to each other to be put into the ſame genus. For this reaſon, therefore, I have made a ſeparate genus of the zigzag Light.

As not only in the diviſion of their ſyſtem, but alſo in its formation, thoſe gentlemen have not paid all the attention they ſhould have paid to the natural claſſification of the ſubſtances, ſo I have altogether followed the ſenſible form of the ſign. This may be faulty in a ſcientific point of view, but it may aſſiſt the memory in retaining the external mark.

The

The Square and the Lozenge I have, for this reaſon, claſſed together, or rather, the two ſquares, which differ only, as the one is perpendicular, and the other inclined. The nature of the ſubſtances they repreſent is very different, but the mark is generically the ſame.

Upon the whole, this ſyſtem of chemical ſigns was intended to be the ſenſible counterpart to the ſyſtem of Chemical Nomenclature. It has followed the ſteps of its original, and partakes of its advantages, and of its imperfections. It has, in one or two inſtances, as thoſe I have pointed out, and ſome others, deviated a little from its prototype, and not much for the better.

One of its chief defects is the impoſſibility of marking, by any principles it points out, the difference of the Metallic Oxides. A circle, with the mark of Oxygen at the top, is the only method

of marking a Metallic Oxide. For, if we put the mark of Oxygen lower, it will then have the force of an Acid; and we muſt not confound the ſituations of the ſigns to mark differences of ſtates, or the whole ſyſtem will become confuſed.

Till the language affords us the means of diſtinguiſhing between the different ſtates of Metallic Oxides, we muſt look in vain for the poſſibility of doing ſo by ſigns; and it is much to be hoped, that both deficiencies will be ſpeedily ſupplied.

It is an extraordinary circumſtance, that a French author, occupied as he daily is, in the manual routine of making preparations for the Lectures of the Polytechnic School, and that, for the inſtruction of ſtudents too, ſhould have made ſo many miſtakes in the Chemical Signs as are to be found in the *Manuel d'un Cours de Chimie*, by

Bouillon

Bouillon La Grange. In that work, he gives a few of the chemical ſigns, as examples to ſtudents; and Water is thus marked $\underline{\text{5}}$ This ſign certainly means Liquid Hydrogenic Acid, as the Combuſtible is Hydrogen, and the Oxygen is ſo placed as to mark the Acid in IC. In the Metallic Oxides, he is perpetually miſtaken, and gives Ferric Acid as the mark for red Oxide of Iron. This is one of the dangers, that ariſe from the abuſe of principles.

It frequently happens, that authors ſeek to make the ſigns ſay more than they can accompliſh, and then the principles are thrown into confuſion. In the ſame manner ſome have imagined, that every ſubſtance, whether a mixture or a compound, can be denoted by a ſimple name, and will on no occaſion uſe a periphraſis. Hence a great ſhare of that confuſion and ambiguity, which by degrees have intruded themſelves into

into chemical language. And it is one of the errors the moſt to be avoided in chemical ſigns.

Mr. Parkinſon has prefixed a frontiſpiece to his Chemical Pocket-Book, and has given ſome chemical ſigns to exemplify the principles. He has fallen into the ſame error as Bouillon La Grange, and throughout the ſeries of Water, whether Gaſeous, Liquid, or Solid, has marked it by Hydrogenic Acid. Mr. Parkinſon is wrong likewiſe in uſing the two firſt letters of the name of the ſubſtance, inſtead of uſing the firſt letter of the firſt, and the firſt letter of the ſecond ſyllable. This fault he has committed in the fifth and ſixth figures of the fourth column.

Dr. Pearſon has committed a radical fault in uſing the initials of the Engliſh names, inſtead of thoſe of the Latin. By this he has circumſcribed the limits of the language, and, from a univerſal character, reduced it to a provincial

vincial dialect. The learned world may be conſidered as forming an empire, of which England, France, Germany, Italy, America, &c. are provinces. If theſe nations all aſſume to themſelves the right of ſpeaking their own language, they will ſoon ceaſe to underſtand one another.

I have already ſpoken of the benefits we receive from the adoption of fixed dead languages in ſcience. But if they are uſeful, even when bent into the different forms, which particular idioms and conſtructions impoſe upon them, how much more muſt they be reſpected, when uſed in a ſyſtem, which has every quality, that a univerſal language can require!

CHAP-

CHAPTER XII.

OBSERVATIONS ON THE SYSTEM OF CHEMICAL NOMENCLATURE, PROPOSED BY BRUGNATELLI.

SINCE this Eſſay was ſent to preſs, the fourth number of the Journal de Chimie et de Phyſique, by Van Mons of Bruſſels, has made me acquainted with a new Syſtem of Nomenclature, propoſed by Brugnatelli, and tranſlated by Van Mons. I have ſeen this Nomenclature only in the tranſlation, and upon the fidelity of that muſt depend the accuracy of the obſervations I ſhall offer.

When a ſcience has undergone a total alteration in its principles, it is not unfair to modify, in ſome meaſure, or even entirely to change, the uſual expreſſions, in order to render them more

analogous

analogous to the new doctrines. It cannot be expected, that perfection ſhall be attained in the firſt attempt, nor, in a ſcience ſo new as Chemiſtry, that progreſſive improvements and diſcoveries ſhall not leave the Nomenclature a little behind hand, unleſs peculiar attention be given to make it keep pace with the increaſe of knowledge. But no attempt to ſubſtitute a new ſyſtem in the room of that, which has been univerſally adopted, can be tolerated, unleſs it be ſupported by abſolute perfection. We ſhall now ſee how far the ſyſtem of Brugnatelli is intitled, upon this ground, to overthrow the labours of the French Neologiſts.

This Nomenclature is printed in a ſingle ſheet, and in columns; the firſt columns containing the names he propoſes to ſubſtitute; and the ſecond columns, the names now in uſe.

He

He begins with Light, Caloric, Oxygen; and we find a note upon the laſt term. The note is, "This principle, combined with Caloric, conſtitutes the concrete baſis of pure Air, or Thermoxygen."

In the 86th number of the Annales de Chimie, page 182, there is an extract from the Annales de Chimie, publiſhed by Brugnatelli. The original of this extract is a memoir by Brugnatelli upon the difference between Oxygen and Thermoxygen. It appears from this memoir, that the author conſiders concrete Oxygen in two ſtates. In the one, it is not combined with any portion of Caloric, that endows it with ſenſible calorific qualities, and is exactly what the French Chemiſts underſtand by Oxygen. In the other, its combined with Caloric; but it is not by that rendered, as the French Chemiſts ſuppoſe, either

either Liquid or Gaſeous, nor is the temperature increaſed. In this new ſtate, there is a combination of Oxygen with a ſuperabundance of Caloric, which Caloric however is not manifeſt. "But," ſays the author, "there it is." This combination of Oxygen with Caloric, on the other hand, can combine with combuſtible bodies, which Brugnatelli divides into *Combuſtibles Oxygènes* and *Combuſtibles Thermoxygènes*; and the combuſtible bodies thus combined, into *Oxides* and *Thermoxides*. All theſe aſſertions he attempts to prove by a number of experiments, not one of which but can be explained in the moſt ſatisfactory manner by the French theory; nor would the author have thought it neceſſary to ſeek for any further explanation, if he had thoroughly underſtood what is meant by the calorific capacities of different bodies. Beſides, he does not ſeem, in the leaſt, to have

conſidered

conſidered the difference between ſlow Oxygenizement, and rapid Oxygenizement or Combuſtion. It would be much too tedious to enter into a complete refutation of the concluſions he draws from his experiments. Suffice itto ſay, that he has taken for granted things, which have no foundation, and that he has proceeded from very wild conjectures to build opinions, which he aſſumes as mathematically proved. From all that he has ſaid, it does no appear in the leaſt neceſſary to admi his diſtinction of OXYGEN and THERMOXYGEN, nor of the ſeries, derived from thoſe terms.

The next term is INFLAMMABLE RADICAL or PHLOGOGENE in place of HYDROGENE. This change alſo is accompanied with an explanatory note. In this note, the author mentions the impropriety of the term Hydrogen, as this ſubſtance enters into the compoſi-

tion

tion of many other bodies, and in greater quantity than into Water. This fuppoſed impropriety has been noticed by other opponents of the French Syſtem. But ſays Brugnatelli, I give it the name of PHLOGOGEN, as conſtituting the baſis of Inflammable Air, the only Gas, which can engender flame, and which confers that property upon many ſubſtances. In another number of the Journal of Van Mons, Brugnatelli writes in a letter to the proprietor of that periodical work, "As a new Gas has been diſcovered, which contains no Hydrogen, yet is inflammable, the name of HYDROGEN cannot be continued to this Gas, but muſt be changed." This is a mode of reaſoning I cannot comprehend; and perhaps it is on that account, that I have not been able to perceive the propriety of PHLOGOGEN.

The term OXIABLE is propoſed, inſtead

inſtead of Acidifiable; an OXIQUE, inſtead of Acid, in order to preſerve Greek etymology throughout the ſyſtem. The terms in themſelves are among the leaſt objectionable of thoſe, propoſed by Brugnatelli, but there is no neceſſity for every word in chemiſtry being derived from the Greek. The Italian, the French, and the Engliſh languages, in general, are compoſed of a variety of others; and they are not the leſs exact for having borrowed expreſſions, ſometimes from the Greek, and ſometimes from the Latin. It is when a heterogeneous mixture of both thoſe roots, in one word, is formed into a hybridous compound, that the term ſhould be rejected. Acid has long been in uſe in the three modern languages; and when any word of long ſtanding does not jar with the ſyſtem, it ſhould not be expunged from the vocabulary of Chemiſtry, merely be-

cauſe it is not of Greek origin. If indeed a new word muſt be created for a new fact or ſubſtance, then the Greek may be preferred, and generally has been preferred, to any other ſource.

The Acids are termed by Brugnatelli OXISULPHURIQUE inſtead of SULPHURIC ACID; OXIMURIATIQUE, inſtead of MURIATIC ACID, and ſo on with the reſt, in conformity to his principles. The obſervations upon the radical denominations apply here.

OXIELO-TARTAREUX — OXIELO-MUQUEUX—OXIELO-LIGNEUX—are, at all events, no better than—PYRO-TARTAREUX—PYRO-MUQUEUX—PYRO-LIGNEUX. But thoſe Acids do not exiſt as ſeparate genera.

SEPTONE, or RADICAL OXISEPTONIQUE, is propoſed, in the place of AZOTE. I have already ſpoken of Azote; and when SEPTONE was propoſed inſtead of Azote, the objections

to

to the word were noticed in the journals of the day.

OXYGENIZED MURIATIC ACID Brugnatelli calls THERMOXYGENIZED. This alone appears to me ſufficient to demonſtrate the fallacy of his theory concerning this ſubſtance.

The author makes a diſtinction between CAMPHOROUS and CAMPHORIC Acid. I have already mentioned the impropriety of diſtinguiſhing the Vegetable Acids into Acids in OUS and IC. Although what Brugnatelli means by CAMPHOROUS and CAMPHORIC ACIDS be really formed by a particular treatment of Camphor, nevertheleſs it cannot be ſaid, that Camphor is the radical, or that it is oxygenized in different degrees in thoſe Acids. If this principle were to be adopted, what terms could we find to expreſs the ſeries? For there are but few of the Vegetable Acids that cannot be converted

into

into Vinegar; and the proceſs, for ſo converting them, is one, which, at firſt ſight, appears to do nothing more than give them Oxygen; although it is well known, that there is a different diſtribution of all the elements, when the Acid itſelf is changed.

A ſimilar miſtake occurs in the change, which the author propoſes in the denomination of OXALIC ACID, which he would term OXISACCHARIC. In a note, he ſays he cannot conceive why the French Neologiſts have introduced OXALIC ACID, inſtead of SACCHARIC ACID, which expreſſes clearly, that Sugar is the radical. The reaſon however is evident. Sugar is no more the radical of this Acid, than Camphor of the Camphoric. Many ſubſtances, at this rate, would be the radicals of Oxalic Acid, and it might have many names. But after all that

has been ſaid upon this ſubject, it muſt now be ſufficiently underſtood.

From the note on SUBERIC ACID, it would appear, that Brugnatelli did not know where he diſcovered that ſubſtance. In fact, he did not diſcover it *in* cork; he *formed* it by the action of Nitric Acid.

The ſeventeenth note is on the Electric Acid. Brugnatelli ſays, that he has been led to conſider this as a very powerful Acid by ſome experiments which he made, in conſequence of the diſcoveries of Volta. Theſe experiments are reported in a preceding number of Van Mons's Journal. I ſhall not take up the time of the reader, in ſtating or in combating the concluſions, drawn by the author from his experiments. I have ſeldom read any thing, which to me appeared leſs demonſtrative than his Diſſertation.

I hope,

I hope, that every perſon will convince himſelf of the truth of this aſſertion; and for this purpoſe, I refer to the author's paper in the Journal of Van Mons.

The Cobaltic Acid of the author has been ſhown by Darracq to be nothing more than Arſenic Acid.

Brugnatelli has not corrected the miſtake of PHOSPHORE; and notwithſtanding his diſcovery of the Cobaltic Acid, he talks of Ammoniuret of Cobalt. His obſervations upon EAU HIDRO-SULFURÉE are very correct and proper.

It would be uſeleſs to examine the propriety of every term, propoſed by Brugnatelli. There are but few, which are not objectionable; and the attempt in itſelf is highly ſo. It tends to nothing leſs than a total ſubverſion of the eſtabliſhed order of Nomenclature; and to lead us to a ſtate of utter confuſion. I do

I do not know any of his names, that are more correct than thoſe of the preſent French Nomenclature; and, if not more correct, are certainly not to be preferred to others, that have received the ſanction of time and of general uſe. Diverſity of opinion will lead to ſound philoſophy, but unanimity will ſtrengthen it, when proved and admitted. And although no man is bound to ſubſcribe to the dictates of another, the diſtance is great from uncertainty to ſcepticiſm. It is perhaps as difficult to doubt with propriety as to aſſert with propriety; and, if experimenters would but recollect how much genius has been engaged in forming the preſent theory, and how much it would require to overturn it, we ſhould not be diſtracted by ſo many ephemeral hypotheſes.

But the moſt extraordinary paſſage of all that I have read of Brugnatelli's concerning his Nomenclature, and one

which

which no doubt will ſurpriſe the philoſophers of this country more than all the reſt, is to be found in the Journal de Van Mons, No. 3, page 320. In this he ſays, that his Nomenclature has been adopted by all the Italian Chemiſts, and begins to be by the Engliſh. I can aſſure the author, that he has been misinformed. I know of nothing in the leaſt reſembling his Nomenclature, that has been adopted by the Engliſh Chemiſts. If he has imagined, that the PHOSOXIDE, and the PHOSACID, and the PHOSMURIATE of Mr. Davy, are a partial approbation of his terms, it may be neceſſary to inform him, that this Nomenclature has never been in general uſe; that it has always been confined to Mr. Davy; and that, very ſhortly after its creation, it was abandoned by its author, together with the hypotheſis, by which it was accompanied.

I am, in ſome meaſure, authorized by many

many of the moſt reſpectable among my chemical brethren in this country to expreſs their wiſh, that, if the learned Profeſſor of Pavia ſhould again have occaſion to mention the Britiſh Chemiſts, on a ſimilar occaſion, he would do us the juſtice to ſay that, in England, his Nomenclature has been unanimouſly rejected.

FINIS.

ERRATA.

Page 7, line 7, dele *metallic.*

——— line 8, dele *metallic.*

Page 10, for *Chapter* 1, read *Chapter* 2.

Page 15, for *Chapter* 2, read *Chapter* 3.

Page 174, line 3, for *nitre* read *nitrate.*

Page 208, line 7, for  substitute 

Page 214, line 5, for *combining* read *combined.*

Page 232, for *Chapter* 12, read *Chapter* 11.

Page 234, line 3 from bottom, for *its*, read *it is.*

For *Gaz Gazeous*, when not in quotations, read *Gas Gaſeous* paſſim.