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XX. On chemical philosophy

Mr. Matthew Allen

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wood, which would render it as light as a common square. The blade may be very easily set to a right angle by making it coincide with a line drawn on the arc for that purpose, where it may be fixed by the clamp.

Should any doubt arise as to the use of this improvement, I shall be happy to attend a Committee of the Society, to explain the difficulties that have given birth to it.

I am, sir,

Your most obedient servant,

No. 11, Gee-street, Clarendon-square. EDMUND TURRELL.

To C. Taylor, M.D. Sec.

Reference to the Engraving of Mr. TURRELL's T *Square.*

Fig. 2, (Plate I.) shows a view of a T square with an adjusting blade; consequently it can be set to any angle and fixed to the arc G, by the thumb-screw D.

Fig. 3, represents a section of fig. 2, in which the action of the thumb-screw D, and the clamp E, may be more distinctly seen, as likewise the screw F, upon which the blade turns as a centre.

The screw F being withdrawn, permits the blade to be taken out, and the edges repaired, if they should receive any injury from wear or accident. The arc G, being divided into degrees, permits the blade to be placed at any angle where it may be fixed by the thumb-screw D.

XX. *On Chemical Philosophy. By Mr.* MATTHEW ALLEN*.

Appendix to Essay I.

THE reason why I have included the views noticed in Essay I. under the title CHEMICAL PHILOSOPHY, is not alone that the consideration of electricity, galvanism, caloric, light, &c. are at present more particularly investigated by the chemical philosopher, but also because I believe the word *chemistry* had originally the most extensive meaning. The ancients considered heat and flame as the most prominent features in the operations of a power, on which every motion, change, and phænomenon depended; and hence it received innumerable names, all expressive of

* Mr. Allen's First Essay appeared in our number for Feb. last (vol. xlix. p. 81), and we expected before this time to have laid the continuation before our readers. With the present communication we have received a letter from the author, which gives but too distressing a reason (a family bereavement) for the delay in sending the promised Essays—Essays which, from the one already before the public, and that introduced in our present Number, we have every reason to think, will not only amuse but afford solid instruction.

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heat or flame, separately or combined. In this way all descriptive names are given; and the reason this power has had such an infinite number applied to it, is, that as one grand cause produces all the infinity of effects in nature, the mind of man has been directed to one part of its operations at one period of the world, and to another part at some other time. It was in this way that the word *attraction* was introduced, and has been more particularly adopted in modern times, because the mind was directed to Newton's theory of planetary motions, as well as to that of chemical affinity:—it is from these causes there appears, on a superficial view, so much contradiction in the different systems that have prevailed in the world. This contradiction, however, arises not so much from direct and absolute error, as from the divisions and separations of that which is true:—it is from dividing that which ought to be joined together; from some men at one period directing their attention to one part of the operations of this power in particular, while others at another time have had their thoughts directed to an opposite point. This has tended not merely to the exclusion of a comprehensive view of the whole, but each of these parts has been and still is carried by both parties to the utmost extreme. Such must for ever remain the fate of science and of every other subject, so long as terms which were originally descriptive of some partial and particular effect or peculiarity continue to be applied to a whole of which they form only a part: for though these terms may at first be received as descriptive, they are soon considered as expressive of the nature and essence of the power, &c. of which they are thus arbitrarily adopted as signs. Newton saw this in adopting the word *attraction*, and which has, notwithstanding his anxiety to guard others against it, become its present meaning in the common acceptation of the word. It is from considerations of this nature that I have preferred the terms "The GRAND AGENT," "The GRAND POWER,&c." The proofs why I conceive the word Chemistry had originally been applied in the same way, are not merely that such words as *chamiah*, *shaniah*, *lama*, *flamma*, and an immense number of other words,—all expressive of heat and flame, singly or jointly, throughout Asia and Europe,—have such a striking resemblance to each other, and in fact identity, considering the different shades of pronunciation produced by substituting the letters *s*, *c*, *g*, *k*, *ch*, *sh*, *w*, *v*, *p*, *f*, *b*, &c. for each other; but several other considerations are connected with their views of the subject, and their notions of the general principles of science. I am aware of this view differing in some measure from that given in Dr. Thomson's History of Chemistry (last edition of his System), and any hitherto adopted. I have not ventured to state this, however, without grounds, and grounds so extensive

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extensive that it would be utterly impossible to state them in this place. To trace the connexion of words with each other, their relation to science and mythology, and all this connected with the men of ancient times, is too alluring, too important, and too mighty a subject to enter upon lightly—at any moment and in any place. I say this for the sake of asserting, that what I have said about others, or about names and definitions, has arisen from feelings and motives very different from that of the vain, flippant, carping, fastidious and wanton spirit of criticism, than which nothing can be more contemptible; but from a conviction that no man has a right to control or withstand that of truth. In the mean time I shall only remark on this subject, that I conceive the Arabians, gathering their notions from Eastern parts of the world, were led to believe that, as the power expressed by the word *chamiah* (to burn) was that which pervaded Nature and produced all its transformations, they could, by discovering its secret principles of operation, perform any transmutation they chose; and hence they called it, by way of distinction, *alchamiah*.

Indeed, in the present day, notwithstanding the partial definition given of this science, and its affected separation from other branches of natural knowledge, every description we have of its powers, its objects, and its applications, describes it not as an insulated portion of human knowledge, but as that, the professed object of which is to remove the veil from the face of Nature; to exhibit the nature, properties, and changes of matter; and to make us acquainted with that wonderful power which produces them. Here are the elements of science! Here is the centre and circumference of a mighty circle wherein all science is included.

Essay II.

I come now to the second division of our subject, that of ATTRACTIVE AGENCIES; a name which I have chosen, and under which I class ELECTRICITY, GALVANISM, MAGNETISM, CALORIC and LIGHT; because, should it in the mean time be objected, that they are not mere effects and phænomena, as I conceive they are, arising from the operations of one power on matter variously modified, and placed in all possible circumstances; it will nevertheless be admitted, that they are powers so different to those things commonly called substances; so highly attenuated, so universally diffused, of such essential importance in nature, and so invariably and intimately connected with all the phænomena of that power we have hitherto called Attraction, that I think the name ATTRACTIVE AGENCIES will apply better than any one yet given them, not only as being more apposite to my views of their powers and science, but even considered as

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secondary causes altogether unconnected with that power. Besides, in either light, the present state of science, and our acquaintance with these agencies in particular, render it necessary to give them a separate and distinct consideration; and in fact, the consideration of these wonderful phænomena,—of electricity, —of galvanism,—of magnetism,—of caloric, and of light, are incomparably the most interesting, entertaining and brilliant parts of the subject.

I need not defend the propriety of this generic term, which I have for the present adopted* :—the reader will be convinced it is the best I could have chosen, in connexion with attraction; the one cannot be altered without changing the other. Nor is it necessary to halt, in order to point out the defective and ill-assorted terms of imponderable substances, or immaterial substances, or impalpable substances, or ethereal matter, or radiant matter, and a variety of other terms which dissatisfaction and difficulty have given them.

Innumerable facts prove that these ATTRACTIVE AGENCIES are connected with attraction in the operations of nature, and so closely that they cannot be discerned to precede or follow each other; and I deny (and shall afterwards prove) that they can be procured separately and isolated. It is from a complete conviction of these facts, that I shall, to avoid repetition, and when speaking in a more general manner, class them together under the terms, *The grand agent*,—*Attractive agencies*,—*The principle* or *power of nature*, &c.

In my opinion, there are no changes in nature or art, no action, movement or operation, however slight or however produced, in which they may not be detected, in whatever light the reader may view them. Whether as primary effects of distinct powers, or as agents, obeying and observing the laws of that power on which every thing depends, the name ATTRACTIVE AGENCIES will apply. By considerations which will be gradually unfolded as I proceed in these Essays (which I hope to do monthly), I have been led to a decided conviction—a conviction so strong that I know not what further proof could increase it—that electricity, caloric and light are merely effects and phænomena arising from the nature of the substances on which, and the circumstances in which, the properties and energetic actions of one power are exerted and applied;—that changes and phænomena differ not in kind, but in degree; not in the power producing them, but in the nature and circumstances of its actions:—But of this in its proper place.

In every system of chemistry, the intimate connexion of ca-

* See Appendix to Essay I. above, from whence it will be evident that I conceive this term objectionable, &c.

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loric and light is constantly remarked. Even since some apparent differences have been more distinctly marked, not only has this union been remarked, but also of both with electricity, "in a way," says a celebrated author, "that indicates there is more in this than we yet understand, or shall perhaps be ever able to comprehend." If then the essence of attraction—of attraction in the abstract—is placed beyond the reach of human sagacity, so perhaps the most accurate conception we shall ever obtain of the phænomena of electricity, caloric, and light, &c. may be incomplete; yet I conceive that we may approach very near to that of accurate conceptions upon them. I say so; not without being aware of this grand and dangerous error; that whenever we attempt, on any subject, more than we ought, it only leads us into fruitless controversy and confusion, so dangerous and so fatal to man on every subject. Though there remains much of science to be discovered, there are limits we cannot pass; and nothing is more important than to know the limits which are assigned to each of us.

The name *attractive agencies* appears to me, however, more applicable to those changes of which, all must allow, they are either the cause which produces them, or inseparably connected with that which does produce them, and therefore more descriptive of the nature of their powers than any thing that we can say upon them.

Our acquaintance with the gases, and our means of exciting the grand power of nature in the varied forms of electricity and galvanism, may be considered as the most astonishing proof of the highly advanced stage and state of the world. To become familiar and conversant with things not palpable to any of our senses in their ordinary state of existence, could never have entered into the cold calculations of reason; nor can reason, proud as she is, calculate the number or measure the extent of those discoveries and improvements that may yet meet us as we advance in our future progress—it is more than her province to say, Here you may hope, but there you shall despair.

We come now to the third division of our subject, to which I have given the name of PASSIVE SUBSTANCES, which are those things or constituents of matter acted upon by ATTRACTION or ATTRACTIVE AGENCIES; and I divide them into SOLIDS, FLUIDS, and GASES. I place PASSIVE SUBSTANCES in this situation in this arrangement, and give them this appellation, because I conceive they owe their subdivisions solely to this power, and the effects which it produces. Without such a power and the agencies it exerts in the creation, where would be our world, or any other? Where would be the grand scenes that creation now presents

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presents to our view? or rather, To whom would they be presented? Where would be the order or harmony, the beauty and life of this magnificent display? Where the powers of contemplation and enjoyment?

I scarcely think I have any need to take up our time with proving the superiority of this term over such as—"material substances," "ponderable substances," "inert substances," "*vis inertiæ**, &c. &c."

Passive substances, with their subdivisions of SOLIDS, LIQUIDS, and GASES included, have this general definition, "*Every thing which occupies space.*" Now we can form no conception of any thing which does not occupy space:—to occupy no space, is to have no existence. This definition therefore is improper; because it either intimates an impossibility, or must include every thing, even infinitude itself, and of course electricity, galvanism, caloric and light. I propose this slight addition, which removes these objections and qualifies it, "*Every thing which occupies a definable space.*" This is the general definition for passive substances, including solids, liquids, and gases. I shall now offer particular definitions to mark and distinguish them from each other; which has not hitherto been done, as far as I know, with that correctness or peculiarly appropriate description which definition requires.

SOLIDS have little or no tenuity and freedom of motion in their parts; and they differ from each other in weight, in hardness, in transparency, in form, and in colour.

FLUIDS possess more tenuity and freedom of motion in their parts; and they differ from each other in density, in colour, opacity, and transparency.

GASES possess most tenuity and freedom of motion in their parts; they are also particularly distinguished by compressibility and expansibility; and they differ from each other in weight, colour, and transparency.

XXI. *Chemical Examination of some Substances used in Ceylon as Remedies against the Bites of venomous Serpents. By* JOHN DAVY, *M.D. F.R.S.*†

IT is well known that certain substances or preparations are used in India by the native empirics or snake charmers, for curing the bites of venomous snakes. As some confidence has been placed in these nostrums, not only by the Indians but by some of the European settlers, it was interesting to ascertain whether any real virtue belonged to them. This object has been under-

* See first Essay on *Vindiciæ Antiquæ*.—Classical Journal.

† Communicated by Sir H. Davy.

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