

THURSDAY, NOVEMBER 11, 1869.

THE DULNESS OF SCIENCE

WE have all heard of the fox who, when he had lost his own tail, tried to prevail upon his comrades to dispense with theirs; and we think it must surely have been in a congress of the blind that the question was first started, "Is it dull to use your eyes and look about you?"

For, in fact, what is science but this? We come unexpectedly into a great mansion, of which we know nothing; and if it be dull to seek out the various inmates of the house, and to ascertain its laws and regulations, then is science dull; but if this be important and interesting, then so also is science interesting.

But, alas! the blind in this sense are numbered by myriads; and as they, for a time, almost threaten to carry their point, a few remarks upon the dulness of science, or rather, perhaps, the dulness of men, may not be out of place.

We have in our mind's eye at the present moment several notable specimens of blind men. One of these lives not very far from where we write—a most hopeless individual; we had better not inquire too narrowly concerning his occupation; he will be found somewhere in the purlieus of this great city. His one sense is the sense of gain. We remember once seeing through a microscope the animalcules of a drop of water, and we noticed that one of the largest of these had one end fixed to the side of the vessel, while its arms and mouth were busy gathering up and swallowing its smaller neighbours. Now, the man of whom we speak is only this animalcule magnified without the microscope. Ignorant of all laws, civil, religious, physical, moral, social, sanatory, he rots in his place until Dame Nature, in one of her clearing-out days, fetches at him with her besom the plague; and he is swept aside and seen no more.

Our country readers are no doubt well acquainted with Farmer Hodge. One day he happened to sit next the poet Coleridge, listening, with that reverence for his betters to which he had been early trained, to the marvellous sayings of the great man, and it was only when the apple dumpling made its appearance that he exclaimed, "Them's the jockeys for me!" Hodge, we fear, maintains no sort of relations with the universe around him. He farms in the same way in which his grandfather did, and has the most profound aversion for the steam plough.

He told Tennyson—

"But summun' ull come ater meã mayhap wi' 'is kittle o' steam,
Huzzin' an' maãzin the blessed feãlds wi' the Divil's oãn teãm.
Gin I mun doy I mun doy, an' loife they says, is sweet;
But gin I mun doy I mun doy, for I couldn abear to see it."

Nevertheless, Hodge has some sense of his duty to his neighbour. Indeed, we learn from D'Arcy Thompson, that being once asked What is thy duty towards thy neighbour? he wrote as follows upon a slate:—

"My duty tords my nabers, is to lovẽ him as thyself, and to do to all men as I wed thou shall do and to me, to love, onner and suke my farther and mother, to onner and to bay the Queen, and all that are pet in a forty under her, to smit myself to all my gooness, teaches, sportial pastures and marsters, to oughten myself lordly and every to all my betters, to hut nobody by would nor deed, to be trew in jest in all my declins, to beer no malis

nor ated in yours arts, to kep my hands from pecken and steel, my turn from evil speaking, lawing and slanders, not to civet nor desar othermans good, but to laber trewly to git my own leaving, and to my dooty in that state if life, and to each it is please God to call men."

Ascending in the scale, we come next to our friend "Cui Bono;" a very good sort of man, very fussy, very philanthropic, and very short-sighted,—in fact, he sees nothing distinctly that is more than one inch from his face. He called upon us the other day to give us a little good advice: it was about the time when our astronomers were investigating the chromosphere of the sun. "What," he asked, "is the use of all this? will it put one penny in your pocket or mine? will it help to feed, or clothe, or educate your family or mine? Take my advice, sir, and have nothing to do with it." We did not reply to him; indeed we learned afterwards that he had just written an article on the subject in one of the journals. Next day he called upon us in a state of high jubilation; he had just seen a friend of his who had succeeded in making a useful application of some great discovery, which, being within the requisite *inch*, was clearly perceived by "Cui Bono"—"A very useful and practical discovery, sir, which will greatly alleviate human suffering; none of your hydrogen-in-the-sun business." And so the successful adapter got all the praise, while the wretched man of science who discovered the principle was left out in the cold.

Still ascending in the scale, we come to a man of strong mental eyesight, but without leisure to use it; one that it makes us grieve to see, inasmuch as he is capable of far better things. His ears are not altogether stopped to the mighty utterance that all nature gives, nor yet is he wholly ignorant, when at night he looks upwards, of that which the firmament declares; but its utterance is drowned in the tumult of a great city, while its starlight is quenched in the smoke. Our sentiment for such a man is that of pity; for indeed, what with the cares of this world and the deceitfulness of riches, he has a hard battle to fight.

But is it not melancholy to reflect how great a proportion of the energy of this country is devoted to the acquisition of gain, and how small a proportion to the acquisition of knowledge?

We have now arrived at the ranks of the affluent and the nobly-born, where, if anywhere, we might expect to find "tastes refined by reading and study, and judgments matured by observation and experience;" but how seldom is this the case? The mental eyesight is often weak to begin with, and often is it rendered still weaker by poring over classics without end. The unfortunate youth is then sent to make the tour of Europe. He is sent to Switzerland and the Alps to see all that is grand in nature, and to Rome and Paris to see all that is great in art, and he comes home wretched and disgusted, and no wonder. He has been made the unfortunate subject of a senseless experiment—an experiment much the same as that of turning a man with weak eyes into a picture gallery in order to improve them. His friends forget that appreciation of the beautiful and the true is the product of the coming together of two things—eyesight and nature. In fact, the result is much the same, whether a man with no eyes is carried out into a glorious

landscape, or whether a man with good eyes is shut up in a dark room.

It is of this the poet speaks, when he says :—

“ O Lady ! we receive but what we give,
And in our life alone does Nature live ;
Ours is her wedding-garment, ours her shroud !
And would we aught behold of higher worth,
Than that inanimate cold world allow'd
To the poor, loveless, ever-anxious crowd,—
Ah ! from the soul itself must issue forth
A light, a glory, a fair luminous cloud
Enveloping the earth ;
And from the soul itself must there be sent
A sweet and potent voice, of its own birth,
Of all sweet sounds the life and element ! ”

But let us hasten to our friend Philosophus, who is a man of quite a different mould. Once, when he was young, his tutor said to him, “ Have the goodness, sir, to solve the following problem : ‘ A hemispherical bowl is filled with a heavy fluid, the density of which varies as the n th power of the depth below the surface ; find the whole pressure and the resultant pressure on the semi-lune of the surface contained between two vertical planes passing through the centre of the bowl, and making with each other an angle 2β . ’ ” But Philosophus thrust the paper violently aside, saying “ I will have none of that, ” and in fact was extremely rude. You may be sure, therefore, that when he came to be a man he had a mind of his own, and carried out his own ideas. He told us lately that he had been studying the laws of energy. It is a mistake, he said, to suppose that these laws are difficult of comprehension ; they are merely remote from our ordinary conceptions, and must be patiently pursued until you grasp them. He had studied them, he said, at all times and on all occasions—in the railway carriage, on the thoroughfare, in the study, on his bed, in the night watches ; and now that he had come to perceive their exceeding grandeur, and beauty, and simplicity, they were a source of great and continual joy to him, and recompensed him more than a thousandfold for all the trouble he had taken. Philosophus lately told us certain truths which may, perhaps, be of service to the readers of NATURE. He said that, not far from London, there was a place where the spirits and understandings of men were annually ground to pieces in a huge machine made of the very best metal ; ay, such is its temper, said he, that were it only made into good broadswords, it might enable us to cleave our way to the very heart of the universe. Again, he said : “ No doubt the dulness of science is a cry of the blind ; nevertheless, men of science are much to blame. It is their sense of beauty that leads them to Truth, whom they discover by means of the glorious garments which she wears. But she is immediately stripped of these, and dressed in an antiquated mediæval garb, worse than that of any charity-school girl, and equal to that of any Guy Faux : no wonder that in such guise her beauty is unperceived by those who cannot pierce the veil, and that as a consequence she is slightly esteemed. ”

There was another thing he told us—a thing of the highest importance. “ The priests of Science, ” he said, “ must consent to use the vernacular, before they will ever make a profound impression upon the heart of humanity ; and when they have learned to do this, let them not fear the sneers of their deacons who will call their teaching sensational. ”

F. R. S.

THE ATOMIC CONTROVERSY

IT is one of the most remarkable circumstances in the history of men, that they should in all times have sought the solution of human problems in the heavens rather than upon the earth. Sixty years ago a memorable instance of this truth occurred when Dalton borrowed from the stars an explanation of the fundamental phenomena of chemical combination. Carbon and oxygen unite in a certain proportion to form “ carbonic acid ; ” and this proportion is found to be invariable, no matter from what source the compound may have been prepared. But carbon and oxygen form one other combination, namely, “ carbonic oxide ”—the gas whose delicate blue flame we often see in our fires. Carbonic oxide may be obtained from many sources ; but, like carbonic acid, its composition is always exactly the same. These two bodies, then, illustrate the law of *Definite* Proportions. But Dalton went a step further. He found that, for the same weight of carbon, the amount of oxygen in “ carbonic acid ” was *double* that which exists in carbonic oxide. Several similar instances were found of two elements forming compounds in which, while the weight of the one remained constant, the other doubled, trebled, or quadrupled itself. Hence the law of *Multiple* Proportions. The question was—in fact, the question is—how to account for these laws. Dalton soon persuaded himself that matter was made up of very small particles or *minima nature*, not by any possibility to be reduced to a smaller magnitude. Matter could not be divisible without limit ; there must be a barrier somewhere. No doubt, as a chemist, he would have rejected the famous couplet—

Big fleas have little fleas, upon their backs, to bite 'em ;
And little fleas have smaller fleas, and so *ad infinitum*.

“ Let the divisions be ever so minute, ” he said, “ the number of particles must be finite ; just as in a given space of the universe, the number of stars and planets cannot be infinite. We might as well attempt to introduce a new planet into the solar system, or to annihilate one already in existence, as to create or destroy a particle of hydrogen. ” All substances, then, are composed of atoms ; and these attract each other, but at the same time keep their distance, just as is the case with the heavenly bodies. The atoms of one compound do not resemble those of another in weight, or size, or mutually gravitating power. But as they are indivisible, it is between them that we must conceive all chemical action to take place ; and an atom of any particular kind must always have the same weight. The atom of carbon weighs 5 ; the atom of oxygen weighs 7. Carbonic oxide, containing one of each must therefore be invariably constituted of 5 carbon, and 7 oxygen : carbonic acid must in like manner contain 5 carbon, and 14 oxygen. Here, then, Dalton not only states that he has accounted for the two laws we have mentioned by making a single assumption ; but he evidently intends his theory to be used as a criterion or control in all future analytical results, and already views it as the birth-place of chemical enterprise.

Such, and so great, was the atomic theory of Dalton ; founded, certainly, on erroneous numbers, but containing in itself the germ of their correction ; aspiring to the command in innumerable conquests ; and setting itself for the rise or fall of the chemical spirit.