

to make a display of our scientific labours in the eyes of the world, or to compliment each other on the success that we may have met with. Outward display belongs not to the proceedings, and the expression of mutual compliment belongs not to the language, of earnest-minded men. We meet, gentlemen, if I comprehend our purpose rightly, to assist and encourage each other in the performance of the laborious daily tasks of detailed scientific investigation. A great thought may possibly arise almost instantaneously in the mind,—and the intuition of genius may almost as immediately recognize its importance, and partly foresee its consequences. Individual labor may also do much in establishing the truth of a new principle or theory; but what an amount of labour may its multifarious applications involve! Nearly two centuries have not sufficed to work out all the consequences of the principle of gravitation. Every theory as it becomes more and more perfectly worked out embraces a greater number of phenomena, and requires a greater number of labourers for its complete development. Thus it is that when science has arrived at a certain stage, combination and co-operation become so essential for its further progress. Each scientific society effects this object to a greater or less degree,—but much of its influence may be of a local character, and it is usually restricted by a limited range of its objects. Up to a certain point no means are probably so effective for the promotion of science as those particular Societies which devote themselves to one particular branch of science; but as each science expands, it comes into nearer relations with other sciences, and a period must arrive in this general and progressive advance which must render the co-operation of the cultivators of different branches of science almost as essential to our general progress as the combination of those who cultivate the same branch was essential to the progress of each particular science in its earlier stages. It is the feeling of the necessity of combination and of facility of intercourse among men of science that has given rise to a strong wish that the scientific Memoirs of different Societies should be rendered, by some general plan, more easily and generally accessible than they are at present;—a subject which I would press on your consideration. It is by promoting this combination that the British Association has been able to exert so beneficial an influence,—by bringing scientific men together, and thus placing, as it were, in juxtaposition every Society in the country. But how has this influence been exercised? Not assuredly in the promotion of vague theories and speculative novelties; but in the encouragement of the hard daily toil of scientific research, and by the work which it has caused to be done, whether by its influence over its individual members or on the Government of the country. Regarding our Association, gentlemen, in this point of view, I can only see an increased demand for its labours, and not a termination of them, in the future progress of science. The wider the spread of science, the wider will be the sphere of its usefulness.

We should do little justice to the great Industrial Exhibition, which, two years ago, may be literally said to have delighted millions of visitors, or to the views of the illustrious Prince with whom it originated, if we should merely recollect it as a spectacle of surpassing beauty. It appears destined to exercise a lasting influence on the mental culture, and therefore, we may hope, on the moral condition of the great mass of our population, by the impulse which it has given to measures for the promotion of general education. We may hope that those whose duty it will be to give effect to this impulse, will feel the importance of education in Science as united with education in Art. An attempt to cultivate the taste alone, independently of the more general cultivation of the mind, would probably fail, as it would deserve to do. I trust that the better education which is now so universally recognized as essential to preserve our future pre-eminence

as a manufacturing nation, will have its foundations laid, not in the superficial teaching which aims only at communicating a few curious results, but in the sound teaching of the fundamental and elementary principles of science. Art ought assuredly to rest on the foundation of Science. Will it, in the present day, be contended that the study of science is unfavourable to the cultivation of taste? Such an opinion could be based only on an imperfect conception of the objects of Science, and an ignorance of all its rightful influences? Does the great sculptor or the historical painter despise anatomy? On the contrary, he knows that a knowledge of that science must constitute one of the most valuable elements of his art if he would produce the most vigorous and characteristic expression of the human figure. And so the artist should understand the structure of the leaf, the tendril, or the flower, if he would make their delicate and characteristic beauties subservient either to the objects of decorative art, or to those of the higher branches of sculpture and painting. Again, will the artist appreciate less the sublimity of the mountain, or represent its characteristic features with less truthfulness, because he is sufficient of a geologist to trace the essential relations between its external form and its internal constitution? Will the beauty of the lake be less perfectly imitated by him if he possess a complete knowledge of the laws of reflection of light? Or will he not seize with nicer discrimination all those varied and delicate beauties which depend on the varying atmosphere of our own region, if he have some accurate knowledge of the theory of colours, and of the causes which govern the changeful aspects of mist and cloud? It is true, that the genius and acute powers of observation of the more distinguished artists may compensate, in a great degree, for the want of scientific knowledge; but it is certain that a great part of the defects in the works of artists of every description may be traced to the defect of scientific knowledge of the objects represented. And hence it is that I express the hope that the directors of the important educational movement which is now commencing with reference to industrial objects will feel the necessity of laying a foundation, not in the complicated details of science, but in the simple and elementary principles which may place the student in a position to cultivate afterwards, by his own exertions, a more mature acquaintance with those particular branches of science which may be more immediately related to his especial avocations. If this be done, abstract science will become of increased estimation in every rank of society, and its value, with reference, at least to its practical applications will be far better understood than it is generally amongst us at the present time.

Under such circumstances the British Association could not fail to become of increased importance, and the sphere of its usefulness to be enlarged. One great duty which we owe to the public is, to encourage the application of abstract science to the practical purposes of life—to bring, as it were, the study and the laboratory into juxtaposition with the workshop. And, doubtless, it is one great object of science, to bring more easily within reach of every part of the community the rational enjoyments, as well as the necessities of life; and thus not merely to contribute to the luxuries of the rich, but to minister to the comforts of the poor, and to promote that general enlightenment so essential to our moral progress, and to the real advancement of civilization. But still, we should not be taking that higher view of science which I would wish to inculcate, if we merely regarded it as the means of supplying more adequately the physical wants of man. If we would view science under its noblest aspects, we must regard it with reference to man, not merely as a creature of physical wants, but as a being of intellectual and moral endowments, fitting him to discover and comprehend some part at least of the laws which govern the material universe, to admire the harmony which