

All who are interested in the devotion of abilities, of means and of leisure to the noblest pursuits, must earnestly wish to see Lord Rosse rewarded by that which he will value most, the steady progress of discovery. It must always be remembered, however, that Astronomy is a science of which hitherto at least it might almost be said that one great genius had left us no more worlds to conquer; that is to say, he carried our knowledge at a bound to one grand, and apparently universal law, to which all worlds were subject, and of which every new discovery had been but an additional illustration. The reign of that law, whether universal or not, was at least so wide, that we had never pierced beyond the boundary of its vast domain. For the first time since the days of Newton a suspicion has arisen in the minds of astronomers that we have passed into the reign of other laws, and that the nebular phenomena revealed to us by Lord Rosse's telescope must be governed by forces different from those of which we have any knowledge. Whether this opinion be or be not well founded—whether it be or be not probable that our limited command over time and space can ever yield to our research any other law of interest or importance comparable with that which has already been determined—still, inside that vast horizon there are fillings-in and fillings-up which will ever furnish infinite reward to labour. Of these, not a few have been secured since our last meeting here. Besides the patient work of our professed astronomers, and the good service rendered by such men as Mr. Lassell and Mr. Nasmyth, who have so well relieved the business of commercial industry by their devotion to the pursuits of science, we have had one event so remarkable, that in the whole history of astronomy it stands alone. If in looking at the wonderful objects revealed to us in Lord Rosse's telescope we turn instinctively; sometimes from the thing shown to the thing which shows—from the Spiral Nebulæ to the knowledge and resources which have collected their feeble light, and brought their mysterious forms under the cognizance of the human eye,—how much more curiously do we turn from the single planet Neptune, to that other instrument which has *felt*, as it were, and found its obscure and distant orbit! So long as our species remains, that body will be associated with one of the most glorious proofs ever given of the reach of the human intellect;—of the sweep and certainty of that noble science which now honours with enduring memory the twin names of Adams and Leverrier.

In Geology, the youngest, but not the least vigorous of the sciences, every year has been adding to the breadth of its foundation—to the depth and meaning of its results. Probably no science has ever advanced with more rapid steps. In 1840 the then recent publication of the "Silurian System" had just established those landmarks of the Palæozoic world which all subsequent discovery has only tended so confirm. The great horizons which were first defined by the labours of Murchison and Sedgwick have since disclosed the same phenomena which they so accurately described, in every quarter of the globe; and the generalisations founded thereupon have been definitely established. The same period has sufficed, partly by the labours of the same distinguished men, to clear up the relative position of the strata which represent the closing epochs of ancient life, and those which form the base of the secondary age. But above all, the last few years have seen immense progress made in our knowledge of that vast series of deposits which usher in the dawn of existing forms, and carry us on to those changes, which, though the most recent, are: at the least obscure of any which have affected the surface of the globe. The investigations of Edward Forbes on the laws which de-

termined the conditions of Marine Zoology have supplied us with data altogether new on some of the highest conclusions of the science; whilst his profound speculations on the centres of creation and areas of distribution have pointed out paths of inquiry which are themselves of inexhaustible interest, and hold out the promise of great results. Another branch of investigation, which, if not entirely new, is at least pursued on a new system, and with new resources, has been opened up in Dynamical Geology by the learning and ingenuity of Mr. Hopkins; whilst the thorough elucidation of the conditions of Glacier Motion, which we owe to Prof. James Forbes, of Edinburgh, has given us clear and definite ideas in one, and that not the least important of the agents in geological change. The observations accumulated during the recent Arctic voyages have materially added to our knowledge of the operation of the same agency under different conditions—conditions which we know must once have extended widely over the firths and estuaries near where we are now assembled—leaving behind them those enduring records of the glacial epoch which were first explored by my friend, Mr. Smith, of Jordan Hill. We owe many important observations on the same phenomena, and on the various changes of sea level, to Mr. Robert Chambers. And if the thanks of science are due to those who advance her interests, both directly by adding to her store of facts or of her discovered laws, and also indirectly by investing them with popular interest, and thus enlarging the circle of observers, we must mention with special gratitude the classical works of Mr. Hugh Miller; and those writings of Sir Charles Lyell, which his indefatigable industry is ever bringing up abreast with the progress of discovery—a progress stimulated in no small degree by his own exertions,—and which are alike remarkable for completeness of knowledge, for fertility of suggestion, and for sound philosophical reasoning. I think we cannot mistake the general tendency of Geological research, whether Stratigraphical or Zoological. It has been to prolong periods which had been considered short; to divide others which were classed together; to fill up spaces which were imagined blank, and to connect more and more in one unbroken chain the course of physical change and the progress of organic life.

We pass from geology by a natural transition to another science which stands to it in close alliance. If all our most sure conclusions respecting the superficial covering of the globe have been founded on the classification of its animal remains, it is not less true that our knowledge and understanding of organic structure have been infinitely extended by the means which geology has afforded of studying that structure in relation to its history in past time. In the hands of our great countryman, Prof. Owen, Physiology has assumed a new rank in science, leading us up to the very threshold of the deepest mysteries of Nature. If the last few years had been marked by no other event in the advancement of science, there would have been enough to signalize them in the publication of his treatise on the "Homologies of the Vertebrate Skeleton:" and we may recollect with pride the fact of that high argument having been first opened at a Meeting of the British Association.

A sad interest, indeed, attaches, in one direction at least, to the progress of our knowledge in Geography. All serious doubt seems to have closed now over the grave of Franklin. Even in a year during which war has been claiming the noblest victims by thousands and tens of thousands, it would ill become this Association not to mark with an expression of our sorrow and admiration the self-sacrifice of that gallant band which has perished in the cause of science. But their devotion has been