

PALÆONTOLOGY AND EVOLUTION.

Essai de Paléontologie Philosophique : Ouvrage faisant suite aux Enchaînements du Monde Animal dans les Temps Géologiques. By Prof. Albert Gaudry. Pp. 230. (Paris : Masson et Cie, 1896.)

THE present volume forms a supplement to Prof. Gaudry's well-known series of semi-popular treatises on Palæontology, entitled "Enchaînements du Monde Animal dans les Temps Géologiques." In it the author has summed up most of the evidence brought forward in his previous volumes, and attempts to deduce from it a general outline of the course of the evolution of the animal kingdom from the dawn of life to the present day. Like so many French scientific writers, Prof. Gaudry possesses in an eminent degree the power of presenting the facts of his science to the general reader in a lucid and attractive manner: in this respect the book leaves nothing to be desired. If however, its arguments be examined, there is less cause for satisfaction, many of them being illogical, and giving evidence of strong bias on the part of the author. Moreover, the neglect of much of the recent literature of the subjects discussed is greatly to be regretted.

The dominant idea of the book is, that there is a general parallelism between the evolution of animals in the course of geological time and the development of an individual man in the course of his life, there being in both cases a gradual increase in the number of the constituent elements, and in the degree of their differentiation, as well as in bulk, activity, and intelligence. That such an analogy is to some extent traceable, probably no one will be disposed to deny, but the writer attempts to push it too far.

Thus two plates of restored figures of various living and extinct animals, drawn to scale, are given for the purpose of demonstrating that there has been a gradual increase in bulk from the first. Now it may be quite true that some of the whales are the largest animals that have ever existed; but if we examine any of the great groups, other than the mammals, which are of comparatively recent origin, it becomes clear that no such progressive increase in bulk has taken place. In most cases there has been an increase up to a certain point; but this has been followed by a diminution. For example, the Amphibia attained their maximum size in the Triassic, the Reptilia in the Jurassic periods. Even the Mammalia seem to be already on the decline in point of size, the Pleistocene species having, in most cases, been larger than their modern representatives. The whales, owing to the peculiar conditions of their existence, are exceptional, but they also are probably doomed to extinction at no very remote date.

As to the causes of evolution, Prof. Gaudry dismisses Lamarck and Darwin in two lines, with the remark that the question is at present too obscure for discussion. He then proceeds to discuss it at considerable length, and arrives at results so remarkably simple, that the reason for his unceremonious treatment of other writers becomes apparent. In short, Prof. Gaudry considers that organic evolution is directed from the outside by a conscious agent, and that while sublunary causes may be held accountable for the loss or reduction of any existing

organ, the appearance of any new structure is attributable to the direct interposition of this guiding power. That such views should find expression in a work by so eminent a writer, and particularly in one intended for the general reader, is much to be regretted, since they are certain to lead to much misconception as to the present position of the doctrine of evolution; while they will be triumphantly quoted as authoritative by those with whose preconceived ideas they seem to harmonise.

The book is well printed and illustrated, and is a storehouse of interesting facts, but is not to be recommended to those who do not possess the necessary knowledge to separate the wheat from the tares.

GATTERMANN'S PRACTICAL ORGANIC CHEMISTRY.

Practical Methods of Organic Chemistry. By Ludwig Gattermann, Ph.D. Translated by William B. Shober, Ph.D. Pp. 329, with 82 Figures. (London : Macmillan and Co., Ltd., 1896.)

FOR some time past the student of organic chemistry has been amply provided with text-books and manuals dealing with the theory and facts of the science, but even now his choice is very limited when he comes to select a book which will help him to overcome difficulties in the laboratory.

For this reason alone the appearance of Prof. Gattermann's work in German was warmly welcomed in this country, not only by students, but also by those who have to direct practical work in organic chemistry; and the translation, which has now been made by Dr. Shober, and which "is intended for those students of chemistry who have not yet become sufficiently familiar with scientific German to be able to read it accurately without constant reference to a dictionary," will no doubt make the work accessible to an even larger number of readers.

The book is divided into three parts, the first of which deals with crystallisation, distillation, and other methods of purification, and also with the analytical methods employed in the case of organic compounds. In this part the author describes in great detail most of the operations which have to be constantly performed in preparation and in research-work, and also the apparatus which is generally employed.

It is evident that the greatest care has been taken to make this description so complete that it would be hardly possible, even for a beginner, to make mistakes in his later work, if he had thoroughly mastered this introductory, but very important, part. In adopting such a plan a certain amount of repetition is perhaps unavoidable, and in some cases instructions which have been given only a page or two previously, are repeated almost word for word. It is no doubt with the same object, namely, of preventing accidents and mistakes, that the author has in a few instances given directions which appear to be quite unnecessary, and which seem to imply that the student is devoid of common sense.

The description of the ordinary analytical methods, which closes Part i., is so minute in every particular that an ordinary combustion, for example, should be carried out successfully by a beginner without further assistance; some portions here might, perhaps, be abridged with