recent theoretical work on the improvement in design of spectrometers and of their application, with enhanced sensitivity, in geological and biological problems and in nuclear chemistry.

In the remaining two articles electrical phenomena are dealt with. The galvanomagnetic effects (the Hall field and magneto-resistance) in conductors are fairly well reviewed by D. K. C. MacDonald and K. Sarginson, but the report might have been improved by the expansion of the first part, the physical survey, with appropriate brief references to the theoretical problems and by omission of the second part, the mathematical treatment. Finally, there is a most interesting, but somewhat verbose and loosely written, account of travelling-wave tubes by R. Kompfner. These tubes are of importance in microwave electronics and have recently found application in communication engineering. Since the Second World War much of the progress is due to J. R. Pierce, of the Bell Telephone Laboratories, though Kompfner himself has made important contributions, and several novel types of tubes have been evolved. The fundamental principle of operation is understood, and much theoretical work has been carried out; but not all the problems have been solved, and experimental work still lags behind theory. The result of Kompfner's survey can therefore be summed up in his own words—namely, that it is impossible, at this stage, to assess the degree of importance which is to be attributed to the various discoveries, devices and developments and to put them in their proper perspective. It may be asked, therefore, whether this is the proper time for such a progress report.

S. WEINTROUB

TREATISE OF PALÆONTOLOGY

Traité de paléontologie

Publié sous la direction de Prof. Jean Piveteau. Tome 1: Les stades inférieurs d'organisation du règne animal; introduction, par J. Piveteau; généralités, par J. Roger, H. Tintant, C. Dechaseaux, L. Cuénot and A. Téry; Protistes, par G. Deflandre, A. Sigal et R. Ciry; Spongiaires, par L. Moret; Coelentérés, par J. Alloiteau et M. Lecompte; Bryozoaires, par E. Buge. Pp. vii+782+10 plates. 8900 francs. Tome 2: Problèmes d'adaptation et de phylogénèse; Brachiopodes, Chétognathes, par J. Roger; Annélides, par C. Dechaseaux et J. Roger; Amphineures, Scaphopodes, Lamellibranches, par C. Dechaseaux et G. Lucas; Gastéropodes, par H. et G. Termier; Céphalopodes, par E. Basse, G. Delépine et J. Roger. Pp. vii+790+24 plates. 9700 francs. (Paris: Masson et Cie, 1952.)

THE first two volumes of Prof. J. Piveteau's seven-volume "Traité de paléontologie" bear witness to the enormous increase in range and complexity of the subject since the last edition of the classic work of Zittel. Six volumes are now needed to cover the animal kingdom excluding man, to whom one volume is to be devoted, and in many Classes the proportion of genera listed to genera recognized is much smaller than in the older work.

Co-operation between editor and printer has resulted in the successful execution of a well-planned lay-out. In the systematic parts, family and sub-family headings in sans serif could have been made more conspicuous by inseting. The latter are particularly difficult to see. Footnotes in these sections (fortunately few in number) are also in-

sufficiently differentiated. In all other respects the book is well produced and easy to work with, though more use might have been made of right-hand page-headings. Illustration, especially of morphological features, is abundant and the photographs of specimens give a more direct idea of the fossils than any line-drawings could convey. The post-Palæozoic corals and the ammonites are even illustrated by collotype plates—the latter quoted from F. Roman's "Les Ammonites Jurassiques et Crétacées" (1938).

Space forbids review of individual chapters, but many general points invite criticism. From Prof. Piveteau's introduction it would appear that nothing significant in palæontology has ever been done outside France (with one Belgian exception). This attitude has fortunately not affected the contributors. The chapters on general principles display that characteristically French blend of authority with enthusiasm which disarms criticism. The various topics are incompletely covered, but the freshness and vigour of the writing should inspire students to understand more about the science and to fill in the gaps by further reading. Unevenness in quality and inconsistency in detail impair the potential utility of the work. Editorial policy could have assured consistency in, for example, citation of author and date for the various systematic categories; statement of scale of magnification or reduction of figures; indication of type-species when cited (too often species are omitted altogether); and adherence to the International Rules of Zoological Nomenclature, especially as regards the use of pre-Linnean names (for example, Vol. 1, p. 666).

The introduction of new zoological names in works of reference is generally condemned; such names are easily overlooked, and there is seldom space for adequate description and discussion. Of several cases in the "Traité" perhaps the worst is on p. 593 of Vol. 1, where a new genus and species are proposed without systematic context. This new genus is not mentioned in the systematic catalogue or in the index. New family names are perhaps less objectionable in text-books, but new names at higher levels involve major taxonomic problems as well as the ethics of teaching. Students have a right to expect that the classifications presented in text-books shall claim at least a large measure of acceptance among competent authorities. A new classification of the post-Palæozoic Corals is here put forward with a persuasiveness and a wealth of illustration which command admiration, but it is doubtful whether there has been the opportunity which is desirable for criticism by interested specialists.

The chapter on the Flagellata epitomizes more than twenty years of pioneer research by M. and Mme. G. Deflandre and merits special welcome. That on the Foraminifera also displays outstanding ability. Of the remaining chapters, the majority are adequate to their purpose, but the systematic parts of those on the Lamellibranchia and Gastropoda have been too drastically shortened and the space allotted to the Rudistidae in the former is disproportionately large.

As works of reference, these two volumes will be found more valuable on general questions than as taxonomic handbooks. The best things have the true Gallic brilliance and penetration and will endure. The weaker parts show that so formidable a task as this is not to be lightly undertaken. It is to be regretted that the books are priced beyond the reach of students.

R. V. MELVILLE