Walther, whether they are a sufficiently exhaustive compilation to inspire thorough confidence.

For example, the information as to the geographical distribution of species is rather unequal, being detailed in some cases, and decidedly meagre in others, as when for *Lagena sulcata* is given only "im Mittelmeer," and when for *Crania anomala* the only north-west European locality is the Clyde! While, on the other hand, such minute local detail is given as that *Globigerina bulloides* is not uncommon in the brackish water of the Dee from Chester to Hilbre Island. A number of detailed criticisms of this kind might be made, such as the extraordinary entry "*Lafoëa*, 450 faths." when several species of the genus are found in quite shallow water. But probably enough has been said to show that the lists are by no means complete.

The plan of the book is, briefly, as follows: first, the gaps in the palæontological record, and their causes, are discussed; then the following groups are treated in succession: Foraminifera, Radiolaria, Spongia, Anthozoa, Crinoidea, Asteroidea, Echinoidea, Holothuroidea, Bryozoa, Brachiopoda, Lamellibranchiata, Gastropoda, Cephalopoda, and Crustacea. A few general questions are discussed. The author alludes to the well-known fact that some of the most abundant groups in the sea are almost unrepresented in the fossil series, and that even amongst animals with hard parts the fossils of a particular bed might inadequately represent what had been the living assemblage at that spot. He quotes Edward Forbes' account of the natural history of a shell-bed off the north-west of the Isle of Man, and his later observations in the Ægean Sea, to show that even the fresh dead remains of organisms on the sea-floor do not always correctly show the relative abundance of the living species.

In each group, after a short account of the characters, mode of occurrence, &c., there follows a list of genera and species, with an indication of the distribution and range in depth, compiled from *Challenger* reports, monographs, and other sources; but there is a want of correlation and digestion of the facts, the nomenclature is not up to date, and the same species sometimes occurs several times under different names; *e.g.* on p. 308, *Ophiothrix fragilis* appears three times under the names *Ophiocoma rosula*, *Ophiothrix fragilis*, and *Ophiothrix rosula*, with a different range in depth each time. Occasionally an animal is found in the wrong group altogether, as, a Holothurian amongst the Asterids, and an Ascidian in the Gastropods. However, Prof. Walther has brought together a considerable amount of material which those who are interested in the distribution of animals in the sea, and the association of species to form "faunas" characteristic of particular regions, will have to utilise. For this the marine zoologists and the geologists will no doubt be grateful, and will, with profit, consult the lists; but I fear they will also sometimes regret that the author had not taken more pains to digest his facts and to correct his proofs. Many odd pieces of interesting information are given; but there is still room in some book on marine faunas for a detailed account of characteristic assemblages of animals with as full a description as can be given of their physical surroundings and their variations. W. A. H.

OUR BOOK SHELF.

Elementary Qualitative Chemical Analysis. By Prof. Frank Clowes, D.Sc., and J. B. Coleman. Pp. 180. (London: J. and A. Churchill, 1894.)

Tables and Directions for the Qualitative Chemical Analysis of Moderately Complex Mixtures of Salts. By M. M. Pattison Muir, M.A. Pp. 44. (London: Longmans, Green, and Co., 1895.)

Laboratory Exercise Book for Chemical Students. By E. Francis, F.C.S. (London: Blackie and Son.)

THE first of these books is an abridgement of Prof. Clowes' text-book on qualitative analysis, adapted for use in the laboratories of schools and colleges. For the most part, the book is like a host of others of the same kind. It differs from many of them, however, in the fact that the first fifty pages is devoted to instructions on the preparation of apparatus, to experiments illustrating the preparation and properties of certain gases and liquids, to descriptions of analytical operations, and directions for the performance of ordinary processes of chemical manipulation. Work of this character forms by far the best introduction to a course of practical chemistry, and it has an educational value, which is more than can be said for mere test-tubing. On account of this and one or two other notable features, the book will probably take a permanent place among laboratory guides.

"These tables and directions" (writes Mr. Pattison Muir) "are intended for the guidance of students who are acquainted with the principles of qualitative analysis, and who are able to make a qualitative analysis of a simple salt, and of a mixture of salts containing not more than a single metal in any one group, and three or four of the common acids." The student who has passed through an elementary course of practical chemistry is frequently puzzled how to conduct an analysis of moderately complex mixtures of salts and the commoner metals and acids, or an analysis of metals and alloys. Mr. Muir's book tells exactly what to do in such cases. By following the directions given, it would hardly be possible for the young analyst to go wrong. The processes described are easily carried out, and are concisely stated. A point worth noting is that the formulæ of solids are printed in heavy type; of liquids or substances in solution, in ordinary type; and of gases, in italics. This method of indicating the physical states of substances certainly possesses advantages. Altogether the book is a handy and trustworthy manual for analytical chemists.

The exercise book arranged by Mr. Francis has apparently been designed to take the place of the laboratory note-book. It opens with a few exercises in practical chemistry, the experiments being briefly—sometimes too briefly—described; and blank spaces are left for the entry of results. Then come a set of analytical tables, and a number of blank forms in which all the steps in the analysis of a mixture of two simple salts are indicated, spaces being left for the student to fill up with his inferences. The average student of practical chemistry works like a machine now, and we have no doubt that these tables will be after his own heart, for they only leave him to fill in his observations as if he were answering the questions in a census paper. The book may serve to drill the student into carrying out his tests in the proper order, but it will not benefit him mentally.

Elements of Astronomy. By G. W. Parker, M.A. (London: Longmans, Green, and Co., 1894.)

THIS is one of the books in which astronomy seems to be regarded as a subject which is to be studied much in the same way as one would take up an additional book of Euclid. It abounds in definitions, propositions, and