cultivation of a closer relationship than has hitherto existed, for the creation of new facilities of study, for the endowment of research fellowships on both sides of the Atlantic, and for the interchange of scientific papers and schemes of work.

Alive to the advantages to herself of a scientific *entente,* Germany before the war used all these means to attract American students to her universities and schools, and to send her students to American schools. A very large measure of success attended her efforts, with the result that not medicine alone, but the sister sciences of chemistry, bacteriology, sanitation and sanitary engineering reaped immeasurable benefits. In this country we have at last awakened to the vast importance of health and of all questions affecting it. Public opinion has demanded that a Health Ministry shall be called into being, and will see to it that the activities of that Ministry, when it comes, are not curtailed in its struggle with disease and ignorance and greed. Public opinion will equally insist that the knowledge gained and progress made by our American friends, who have essayed this task in a broader spirit and at an earlier date than ourselves, are fully utilized, and the support that they may be willing to afford us secured. We shall fight our battle with hands greatly strengthened if we fight it as members of a world-wide community. Disease is international. The hope of the conquest of disease lies in prevention, which must be international as well as local. In this respect no man and no community can say that they live to themselves. A badly constructed drain in a country village contaminating a source of water supply may give rise to an epidemic of great proportions, and this may conceivably be carried by hosts of one kind or another to the world's end. We hope, therefore, that a scientific *entente* will not stop at medicine in the narrow sense of that term. America, for example, leads the whole world in the matter of its milk supply, and our bacteriologists and social workers cannot afford to let the opportunity of help in this direction remain unimproved. Our Ministry of Health, indeed, when formed, will be strengthened in every way by the establishment of friendly relations with the State Boards of Health that have already done so much for America. We are aware that some steps towards the development of such a policy as we suggest have lately been taken, and that other measures are in contemplation. This is satisfactory so far as it goes. But the broadest possible basis of understanding is the best basis in the circumstances, and all branches of scientific work having the public health as their object should take part in the movement.—London *Times.*

SCIENTIFIC BOOKS

Principles of Economic Geology. By WILLIAM HARVEY EMMONS. McGraw-Hill Book Co. 1918. Pp. 598.

There are two recent books with which this at once invites comparison—Lindgren's "Mineral Deposits," and Ries's "Economic Geology." It is not as comprehensive as the latter, for it omits the whole of the important subjects of coal, oil and other fuels. Perhaps for this reason and to avoid confusion in title the word "Principles" is added. To the reviewer the fact that every improvement in transportation or manipulation, like the cyanide process, increases the value of the raw material and consequently lowers the grade of the material which it will pay to work, that there is a tendency to work from small quantities of high-grade material to large quantities of low-grade material, that production is normally in an accelerated ratio, should be classed as principles of economic geology. But it would not be easy for the student to pick out these or any other *economic* principles. The economic data are indeed scanty and not systematic, and there is little or no attention paid to the principles of valuation.

But if the economic side is scantily handled the geologic receives much fuller treatment. In fact twenty-one out of twenty eight chapters are concerned with the classification of ore deposits in general, their structural features and sources. Particularly valuable is the summary prefixed to the earlier chapters on the different types of deposits. Chapters

17 on structural features is also valuable. Mine waters also receive better treatment than they often do. But in his argument for the importance of ascending juvenile thermal waters one might have hoped to see a comparison of the analyses of waters with those which would be obtained from the connate or meteoric waters stimulated in circulation by hot intrusives. There is a lot of sodium carbonate and sulphate in the mine waters of many regions where "alkali" is also characteristic of the surface waters, while the mine waters of other districts are quite different. It may well be that we have a mixture of waters from more than one source, and while the author rightly attributes to precipitation by mixture of solutions an importance which is often overlooked, yet it may have even greater importance.

The range of reference is rather narrow, mainly, though by no means exclusively, to the western United States. In that respect both of the other books are superior. For instance in discussion of the class of zeolitic native copper deposits no reference is made to the work of Weed and Lewis on those of New Jersey, and one might think that Keweenaw Point was unique, except for a footnote reference to White River, Alaska. With regard to the Keweenawan deposits there are a number of minor slips (p. 397). Copper veins are still of considerable importance at the Ahmeek and adjacent mines, nor was the copper obtained from veins formerly, nor at present, wholly or mainly sulphide. It is usually native, sometimes the basic arsenide, and even in the Nonesuch lode one would hardly say that the ore was "chiefly" chalcocite. The Nonesuch mine saved only the native copper. It is noteworthy that there is no such systematic attempt to present diverging points of view fairly as is made by Ries. Compare for instance the treatment of oolitic iron ores in each. This is probably due to the origin of the book as a course of lectures. So, too, while Lawson is referred to, as to his western work, no reference is made to his Lake Superior work. Neither is Allen's declaration that the Animakie is middle Huronian considered. The Keweenawan is classed without a question as pre-Cambrian.

After the extensive treatment of ore deposits, iron, copper, gold, silver, zinc and lead receive treatment in separate chapters, while all the rest of the substances are dismissed in the last hundred pages.

Two relatively new terms are protore: "low-grade metalliferous material not itself valuable from which valuable ore may be formed by superficial alteration and enrichment," and the horsetail structure applied by Sales to divergent minor fractures. Both these seem to be useful.

There is no list of illustrations.

Alfred C. Lane

Aquatic Microscopy. By Alfred C. Stokes. Fourth Edition. New York, John Wiley and Sons. 1918. Pp. 324.

The new edition of this well-known guide for beginners retains the general features of the earlier editions. Chapter XII. of the third edition, "Some Common Objects worth Examining," has been replaced by a "Synopsis of the Preceding Chapters," which is a convenient, brief key to the forms described in the book. Minor changes have been made in the text, various scientific names have been modernized, and some of the keys have been extended. The book should continue to be a favorite, not only with the young microscopist for whom it is intended, but with many zoological students and teachers as well who desire to identify quickly and easily some of the commoner aquatic organisms.

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SPECIAL ARTICLES

ADAPTATION IN THE PHOTOSENSITIVITY OF CIONA INTESTINALIS

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Ciona intestinalis of the Pacific Coast[1] re-

[1] These experiments, the details of which will appear later, were performed at the Scripps Institution for Biological Research at La Jolla, California. My thanks are due to Dr. Ritter and his staff for the many courtesies shown me.