

such knowledge and methods as by their generalisation may increase the efficiency and thereby the prosperity of the nation as a whole. The next few years will be marked by the introduction of one legislative measure after another directed to this end, but probably in many cases ill-conceived from lack of acquaintance among law-givers and people with the intimate character of the problems involved. To those problems which affect the life of the individual this series of lectures will serve as an interesting and authoritative introduction.

#### SOUTH AUSTRALIAN GEOLOGY.

*The Geology of South Australia.* (In two divisions.) Division 1, *An Introduction to Geology, Physiographical and Structural, from the Australian Standpoint.* Division 2, *The Geology of South Australia, with Notes on the Chief Geological Systems and Occurrences in the other Australian States.* By Walter Howchin. Pp. xvi+543. (Adelaide: The Education Department, 1918.) Price 10s.

FOLLOWING the example of Mr. Chapman's Australian fossils—an outline of palæontology based on Australian examples for Australian students—Mr. Howchin, of the University of Adelaide, has prepared a general text-book of geology based on Australian illustrations, followed by an account of the geology of South Australia, with shorter summaries of that of the other Australian States. The book should be very useful, as it fills a gap in Australian educational literature, while it supplies geologists in general with an excellent and up-to-date compendium of the geology of South Australia. Mr. Howchin is exceptionally qualified for the work; he is well known for his discovery of the Australian Cambrian glacial deposits, his researches on fossil foraminifera, and his text-book on the geography of South Australia. The first division of the work gives a clear summary of the general outlines of geology; it is especially good in the physiographic portions. The petrology is comparatively elementary, since the book, being published by the South Australian Education Department, is probably intended more for secondary schools than for university students. Australian petrologists may consider that there is inadequate notice of the alkaline igneous rocks; and in an effort at simplification "pyroxene (augite)" is included in the hornblende group, a step which would lead students to overlook the important distinction between the pyroxenes and the amphiboles. The parallelism of these series is also not indicated in the statement as to the composition of augite. There is not much information about economic geology; for example, the author tells us nothing about the oil-fields of South Australia and their prospects. He follows those who extend the petrographic use of the word "mineral" for mineral species into general geology, although mineralogists, such as Miers, adopt the more commonsense practice which does

not refuse the term "mineral" to most economic minerals. The author, of course, cannot be consistent, for the term is not used in the latter part of the book in accordance with the restricted definition. In regard to the Australian artesian water, the author adduces evidence that the supply is dwindling from the reduction in size of the mound springs; but those who hold that plutonic water is largely influential in the uplift of the water in the wells do not consider, as is twice stated, that most of the water is plutonic in origin.

Mr. Howchin makes the interesting suggestion that the word "scree," of which the etymology is doubtful, comes from "screed," a fragment; but is it not more probably from "screen," owing to the resemblance to the sloping sheet of angular fragments on a road metal screen? The most important chapter is that on the Lower Cambrian glacial deposits, which extend northward from Adelaide for about 450 miles to a latitude as low as 29½. The author, to whom is due most of the existing knowledge of these beds, shows that they were probably laid down at sea-level. The occurrence of this great sheet of subtropical low-level glacial deposits at the very beginning of the fossiliferous rocks is one of the most significant facts in geological history. Mr. Howchin also tells us the latest information from the transcontinental railway bores as to the extension into Australia of the Cretaceous sea, and shows that in all probability it did not extend across the continent. The book is illustrated by numerous well-selected and excellent illustrations.

J. W. G.

#### OUR BOOKSHELF.

*Annual Reports on the Progress of Chemistry for 1918, issued by the Chemical Society.* Vol. xv. Pp. ix+240. (London: Gurney and Jackson, 1919.) Price 4s. 6d. net.

THESE important volumes have been issued annually by the Chemical Society since 1905. Their object is to present an epitome of the principal definite steps in advance which have been accomplished in the preceding year for the benefit of workers or students in pure or applied science. They are not popular in any sense of the word. During the war there was necessarily some slackening in the production of results bearing chiefly on purely scientific problems, and the volume for 1918 is somewhat thinner than the volumes issued in previous years. Nevertheless, some advances can be recorded. For very many years the mass of the atom has been regarded as determining its chief properties. This is embodied in Mendeléeff's periodic scheme familiar to every chemist. It is therefore not surprising to find that the new doctrine which assumes some knowledge of the internal constitution of the atom should be rather slowly accepted. But chemical physics or physical chemistry is a department of knowledge which is undergoing