

animal and the two chapters on fishes. In general the line blocks are good, the half-tone blocks so poor that they are sometimes unrecognizable, for example, the bull frog (Fig. 272), Linnæus (Fig. 12), and *Perophora* (Fig. 407). The text has been brought up to date, especially as regards recent work on hormones and vitamins; but here and there a statement causes a shock to the reader, such as this from the chapter on *Amphioxus*: "Ciliated nephridia similar to those of the earthworm lead from the dorsal portion of the coelom to the atrial cavity".

The production is pleasing, and the price (25s.) is not exorbitant. N. B. EALES

## EARTH HISTORY

The Formation of the Continents by Convection  
By G. F. S. Hills. Pp. vi + 102. (London: Edward Arnold and Co., 1947.) 7s. 6d. net.

THE discontinuous sialic continents floating in the continuous simatic layer and the folded belts of the crust present two of the grandest problems of geology. In this essay, the solutions advanced are these. First, in the early liquid stage of the earth, crystallization began with the sinking of heavy olivine and the floating of light felspar; these floating crystals were carried by convection to the poles to form clumps which, as the liquid magma became more viscous and convection ceased, were then moved to the equator by the Eötvös force. During these operations, radioactive substances, concentrated in the felspathic material, heated the underlying olivine-layer which, thus expanded, elevated this material above the oceans to make the Laurasia and Gondwanaland of the palæogeographer.

The second problem is solved as a consequence of this expansion; the continental masses, pegged down to the Pacific rim, are domed up by uprise of basaltic material which, finding its own level, escapes around the rim, creasing up the continental and geosynclinal margins into the fold belts and, spreading over the floor of the present Pacific, carries with it fragments of continental material that formed, for example, New Guinea, Fiji and other islands. This gigantic basalt flow was responsible for the Cenomanian Transgression and a variety of other events.

With these two mechanisms in mind, the author discusses the Atlantic rift, the roots of mountains, the origins of fiords, the cause of the Quaternary glaciation, the salt in the sea and the absence of fossils in the Pre-Cambrian rocks, and finds many of the hard problems connected with these diverse topics more amenable.

Inquiries such as these into the mechanisms of the earth are naturally of interest to the geologist, who is usually not qualified to make them—he leaves it to the mathematician or geophysicist. The author views a great many geological operations in a different way from the geologist. His conception of the crystallization of magma, the formation of granite, the production of gneissose texture, the history of the fold-belts—to name a few special points—and his general use of the geological time-scale, are not those of the geologist dealing with the detailed anatomy of the crust. But still the author's proposals must be considered alongside those of Daly and Sir George Darwin, when the geologist comes to contemplate the bearing of his mass of detail on the grand problems of earth-history.

H. H. READ

## FRUIT GROWING AND STORAGE

### Harvesting and Storing Garden Fruit

By Raymond Bush. Pp. 162+16 plates. (London: Faber and Faber, Ltd., 1947.) 12s. 6d. net.

WHEN Mr. Raymond Bush sits down to write a book or an article, one may be sure that the result will be well worth the gardener's reading. There is always much wisdom, not untinged by humour, much of a life-time's accumulated experience and, usually, something at least to make one doubt or even disagree. His new book is no exception; no fruit-grower could read it without enjoyment and without learning a great deal; but some at least would feel a sense of disappointment. The book was obviously intended originally for the amateur fruit-grower—its title alone leaves no doubt on that point; but the author's enthusiasm for his subject carries him outside his field, and some of his suggestions would be beyond the means or the needs of all but the wealthiest of amateurs. The suggestion, for example, that quick-freezing of fruits and vegetables could be practised in the home is surely misleading, to say the least, when one considers that for satisfactory preservation an initial temperature of about  $-30^{\circ}$  F. is necessary. On this subject, details of the method of processing seem of little value or interest to the public for whom the book is intended, while for anyone seriously considering factory-production the information would be hopelessly meagre.

Taken by and large, it is a curiously compounded volume; one is left with the feeling that the author set out to write a book specifically to the title, and then, having found that it was of insufficient size, added five chapters at the beginning containing random dissertations on soils and climates for fruit-growing, manuring, pollination and other cultivation problems, all full of good advice and wise comment but having little direct bearing on the real subject.

On the central matter of storage, one cannot again help but feel a sense of disappointment. The storage of fruits has been a matter of such intensive scientific research, research which is not so difficult to 'put over' to the layman, that some attempt might be made to explain the physiological principles involved. The meaning and significance of the 'climacteric' in fruit ripening and storage is surely worth more than two paragraphs of explanation. Again, if the description of the quick-freezing process was worth inclusion, something might have been said of gas-storage, even if only to make the layman aware of the possibilities and limitations of the process.

At the end, the author again adds four chapters, which one would not expect from the title, on jam-making, bottling and canning, wines and fruit-juices. Here, at least, is a field in which the amateur can practise, and if the book stimulates a revival of the old art of home cider-making it will, on that alone, achieve much. The descriptions of home-made fruit wines fill one with the desire to start without delay on one's own 'brewery'; but further reading discloses the need for impossible quantities of that rare commodity, sugar, and regretfully one abandons hope until more spacious times come back.

Despite the criticisms which have been made, the book, as has been said, is one which all interested in fruit-growing can read with profit and enjoyment.

R. H. STOURTON