and the nature of the so-called annual rings. From the age of individuals we are led on to archæological evidence of antiquity. "From the period claimed by archæologists we pass by gradual stages into the domain of the geologist."

Before entering on this field, a chapter on geographical distribution, a subject of which the importance has not always been realised by modern students, is appropriately introduced. Darwin's high appreciation of the study of distribution, which he called "that almost keystone of the laws of creation," is emphasised. Quite recently, interest in distribution, stimulated by the kindred study of ecology, has much revived.

In his sketch of the geological record, Prof. Seward points out that the history of the world's flora must go back immensely farther than our records show. "The relics of plant-life furnished by the Devonian and succeeding formations represent the upper branching-systems of a deeply rooted and spreading tree, the lowest portions of which have been destroyed or have left no sign of their existence" (p. 44).

The preservation of plants as fossils is the subject of chapter iv. A particularly striking picture of the flood-plain of the Rio Colorado, with drift-wood stretching over a tract 25 miles across, gives a vivid idea of how a fossil "pine-raft" may have been formed.

The four succeeding chapters illustrate the general theme by special examples of "links with the past," taken from the ferns, the big trees of California, the Araucaria family, and the maiden-hair tree.

The illustrations throughout are remarkably good. Mr. Tansley's photographs of Malayan ferns are of exceptional beauty. The book concludes with a full bibliography and a useful index.

D. H. S.

How to Attract and Protect Wild Birds. By M. Hiesemann. Translated by Emma S. Buchheim. With an introduction by Her Grace the Duchess of Bedford. Second edition, with many revisions. Pp. 101. (London: Witherby and Co., 1911.) Price 1*s.* 6*d.* net.

WE have already directed attention (NATURE, July 22, 1909) to the first edition of the useful little work by Martin Hiesemann on the practical preservation and protection of birds by the provision or creation of opportunities for their breeding, winter feeding, and by fighting the enemies of birds, and little remains to be said of the second edition except that it has been revised and enlarged in many essential points. This excellent little book was written for Germany, where the birds' natural conditions of life differ somewhat from those prevailing in this country. For instance, our winters are less severe, and so less systematic feeding at that season may be necessary; our country is, generally speaking, less open and more wooded (hedgerows, gardens, and ornamental grounds and plantations being taken as woodlands in this connection), so that the provision of special breeding plantations may not be desirable here. Our birds of prey have been closely killed down, and there seems to be no way (permitted by law) of dealing with the domestic cat, the birds' worst enemy in this country.

But the portion of the book dealing with the provision of nesting places for birds which breed in holes deserves the closest consideration by those who wish to encourage the different species which fall under this category; for the difficulty experienced by these birds in finding nesting places has greatly increased, since by the rules of modern forestry nearly every old tree is felled, without regard to the fact that the holes it contains serve as shelters and nesting places. Those men who care only for what is of practical use grudge the old, decayed trees the little space on which they stand, and prefer to convert them into firewood. The remedy for this is the provision of nesting boxes, and we are told here what is the right sort of box, and the right—and the wrong—way of hanging them up. The illustrations are numerous and very useful.

Applied Biology. An Elementary Textbook and Laboratory Guide. By Prof. M. A. Bigelow and Anna N. Bigelow. Pp. xi + 583. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1911.) Price 6*s.* net.

THIS volume has been prepared for use in higher schools during a year's course of five hours per week. The frog and the bean-plant are taken as types for the study of animal- and plant-structure and biology. The succeeding part of the book contains an account of the structure and life-histories of "seed-plants" and "spore plants" (ferns, mosses, algæ, fungi, and bacteria). The chief phyla of the animal kingdom are traversed in the third part of the book; but the authors have attempted to compress too much material into these 140 pages, with the result that many subjects are necessarily considered so briefly that only imperfect ideas of them are conveyed. For instance, "Paramecia reach a state when they are unable to continue to divide. Two such individuals come into contact, and through their delicate cell-walls some of the nucleus of each one passes over to join the nucleus of the other,"—is surely an incorrect and inadequate account of the conjugation phenomena. There are a few slips in this part of the work, *e.g.*, the sword-fish is placed among the cartilaginous fishes. The succeeding part of the work deals in an interesting manner with the structure of the human alimentary canal, digestion, food-values, blood, respiration, excretion, and nervous activity, and leads up to an application of biological principles to personal hygiene.

The book contains much information on biological subjects of public interest, *e.g.*, toxins and anti-toxins, mosquitoes and flies in relation to disease, the bacterial treatment of sewage, parasites in meat, and shows clearly the important bearing of a knowledge of biological science on many aspects of human life.