

appears that this coastal flora has a predominant European character, but that about one-half of the European species may also occur in colder seas; and, further, that diatom-life is most abundant on the south-west coast. The author also gives a synopsis showing the association of the genera and species of diatoms with the various genera of seaweeds.

The greater part of the book (p. 395 to the end) is occupied with a detailed study of the moss flora of the island, based mainly on Mr. Hesselbo's own collections and investigations. This comprises a systematic list with full notes on the distribution of the species mentioned, and including ninety-three liverworts, twenty sphagna, and 326 true mosses. A full account of the Bryophyte communities follows; first the lowland formations, and secondly the vegetation of mountain heights. Mosses play a very important part in the plant-covering of Iceland, occurring either as an essential component of practically all the plant associations, and often in far greater numbers as regards species and individuals than do the higher plants; or as distinct Bryophyte associations from which other plants are entirely absent, or in which they occur only as a subordinate component. The lowland formations are classified as littoral, hydrophilous or wet-soil, mesophilous, xerophilous (heaths), the vegetation of the rocks, and the vegetation of the lava-fields. The hydrophilous afford the greatest variety, the formations varying with the character of the water or soil; especially interesting are those of the hot springs, which the author describes in some detail. A number of successful photographic reproductions illustrate the prominence of the mosses in the Iceland flora.

*The Main Currents of Zoology.* By Prof. W. A. Locy. Pp. vii+216. (New York: Henry Holt and Co., 1918.)

THE aim of this book is to explain to the student and to the general reader what have been the main movements in the development of zoology. In the nineteenth century, with which the author begins, the outstanding biological advances were the discovery of protoplasm, the formulation of the cell-theory, the establishment of the doctrine of evolution, the rise of bacteriology, and the beginning of the experimental study of heredity. After interesting chapters on taxonomy and Linnaeus, on comparative anatomy and Cuvier, on embryology and von Baer, on physiology and Claude Bernard, the author indicates what seem to him to be the five chief pathways—structural zoology, systematic zoology, general physiology, experimental zoology, and philosophical zoology. This does not seem very satisfactory, for "systematic zoology" is taken to include classification (which belongs to morphology), ecology and study of habits (which belong to physiology); and "experimental zoology" is, as Prof. Locy says, "more a method of general application than a subdivision."

A chapter on insects illustrates a very characteristic modern current, the study of the carriers

of important disease-producing organisms, such as those causing malaria and sleeping sickness. Then follows a terse but very clear exposition of theories of evolution. A chapter is devoted to a consideration of the discoveries leading to vaccination and to the use of anaesthetics, with emphasis on W. T. G. Morton's work (1846) in connection with ether. "The ten foremost men of zoological history" are (after Aristotle) Harvey, Malpighi, Linnaeus, Cuvier, von Baer, Johannes Müller, Pasteur, Darwin, Max Schultze, and Mendel. The study ends with an estimate of the contributions to zoology made by different nations, and with an emphasis on the international character of science.

There is a copious, well-arranged bibliography, and students will also welcome the series of photographs of great zoologists. Prof. Locy is beyond question right that the educational value of a science is greatly enhanced if the historical setting is made clear, and towards that end his book will be found thoroughly effective.

J. A. T.

*A Primer of Engineering Science.* By E. S. Andrews. Part i., "First Steps in Applied Mechanics." Part ii., "First Steps in Heat and Heat Engines." Pp. ix+95+67. (London: James Selwyn and Co., 1918.) Price 3s. 9d. net.

BOTH parts of this book are bound in one volume. Part i. contains chapters dealing with forces, moments, work, power, energy, machines, various types of mechanism, friction, stress and strain. The matter in this part is taken from the author's "Introduction to Applied Mechanics," which was reviewed in NATURE of January 20, 1916. The experimental work described in this part is weak. Six experiments in all are described; the first three only are numbered. Judging from the use made of spring balances in two of the experiments, these appliances have no weight. Part ii. is new, and consists of five chapters dealing with types of heat engines, measurement of heat energy, properties of steam, expansion, indicator diagrams, and the transmission of heat. There are a summary of the contents at the end of each chapter, and also some exercises to be worked by the student. Ten experiments are described in this part. No table of the properties of steam is given; a graph is included, but stops at 100 lb. per square inch; since it is reproduced to a small scale, accurate readings cannot be taken from it. There is evidence of haste in the compilation. On p. 2 the piston ring is described as a "junk" ring; Fig. 6 (c) on p. 9 is wrongly arranged; it is stated on p. 39 that Boyle discovered his law in 1862; on p. 50 a diagram traced by an indicator is described as "a diagram of resultant force or effort upon a body." Some of the diagrams are badly reproduced, this being owing to the quality of paper used. Considering the book as a whole, the young student will find some parts interesting and helpful; other parts are treated unsuitably, and a considerable amount of supplementary matter will have to be supplied by his teacher.