fashion, partly as an essential factor in our mechanism for directly obtaining and preparing most of the material comforts of modern living, and partly as one of the most intimately searching of the available rays of intellectual light on the philosophy of nature. The usefulness of the science in its former capacity is easily traced, and any one can see that as methods of manufacture are improved and competition increases, the numerical data involved must be more accurately known. Nevertheless, this manner of helping mankind, although the most direct and obvious, is by no means the most effective way in which increased precision in scientific work may be of service. A much greater gain is ultimately made, although indirectly, through the vastly augmented clearness of view which is given to the science as a whole by the increased stability and trustworthiness of the fundamental basis of facts. The resulting growth of either physical or chemical science as a whole not only brings with it increased satisfaction, and respect for man's intellect; it may also at any time lead to wholly unexpected and unforeseen developments of practical usefulness about which man could not otherwise have dreamed. Thus Liebig and Soubeiran, when they found chloroform, little thought of the priceless boon which the new substance would bring with it to suffering humanity. Faraday, in studying the behavior of wires and magnets, never dreamed of the miracles to be wrought by the modern dynamo. Röntgen was striving only to advance scientific knowledge and not to furnish a sure guide to the puzzled surgeon in his crucial task, when the almost incredibly penetrating rays were discovered.

These records of the past lead us to look forward towards the beckoning future. Has the advantage to humanity to be gained by furthering pure science come to an end? No, a hundred times no! Not until man really understands himself and his environment, will the possibility of the discovery of some new blessing be ended. Prophecy is inevitably uncertain; and yet when one realizes that our frail and often jangling human mechanism is actuated essentially by a series of chemical reactions, and that every material thing connected with our life is a chemical substance, one feels that chemistry must still have vast treasures in store for the human race. What may she not accomplish for the comfort of living, for a rational practise of medicine, for a profound philosophy of nature! One can not but believe that as yet her mission is scarcely begun; and if this mission is to be fulfilled, the great result must be wrought not by superficial, but by fundamental understanding, built upon the solid foundation of exact knowledge.

THEODORE W. RICHARDS

SCIENTIFIC BOOKS

The Warblers of North America. By FRANK M. CHAPMAN, with the cooperation of other ornithologists. With 24 full-page colored plates, illustrating every species, from drawings by LOUIS AGASSIZ FUERTES and BRUCE HORSFALL, and half-tones of nests and eggs. New York, D. Appleton & Company. 1907. Pp. x + 306. Cloth, $3.00.

Few groups of North American birds are of such general interest as the wood warblers, and this attempt to bring together the information concerning them is a welcome addition to ornithological literature. Its title, however, would much better have been "The Wood Warblers of North America," for the true warblers, family Sylviidæ, also represented in North America, are not treated at all.

Following an "Introductory" chapter, in which the plan of the work is outlined and a

list of contributors given, comes the first division of the subject, a consideration of "The Wood Warblers" in general. In this division are the eight headings: General Characters, Plumage, Distribution, Migration, Songs, Nesting Habits, Food, and Mortality. Of these the article on "Migration of Warblers," by Professor W. W. Cooke, that on "Food of Warblers," by Mr. Edward H. Forbush, and that on "Mortality among Warblers," are particularly interesting.

The second division, which comprises the major part of the book, is concerned with a detailed treatment of genera, species and subspecies, unfortunately following the inverted order of Mr. Ridgway's recent review of the family, without his excellent reason therefor. This portion includes for each genus its diagnosis and general characteristics; and for each species and subspecies pertinent information condensed into readily accessible form under a number of subheadings. "Distinguishing Characters" consist of the salient differential points of plumage, together with usually the measurements of total length in skin, wing, tail and bill. We are not, however, altogether satisfied that, as Mr. Chapman claims, the total length of a bird can be more accurately ascertained from a dried skin than from a fresh specimen! Descriptions of the various phases of plumage, from nestling to adult, are next given, and these seem to be full enough for most purposes of identification and comparison. "Geographical Distribution," written chiefly by Professor W. W. Cooke, follows, and is in most cases excellent and very complete, being separated under General Distribution, Summer Range, Winter Range, Spring Migration and Fall Migration—an admirable arrangement, although the General Distribution would much more logically have included the winter as well as the summer home. "The Bird and its Haunts" includes various notes on general habits—again much information in a small compass. Other captions, self-explanatory, are "Song," "Nesting Site," "Nest," "Eggs," "Nesting Dates" and "Biographical References" (to literature).

A "Hypothetical List" of two pages enumerates the species that, according to our author, have but a questionable place in the North American list, by reason of doubtful specific validity or unproved occurrence within our limits.

The book is illustrated by 24 colored plates of birds, 4 half-tones of nests and nesting sites and 4 of eggs. The half-tones, as well as the colored figures, with a few exceptions, such as the water-thrushes, ovenbird and cerulean warbler, are good.

Harry C. Oberholser

Étude minéralogique des produits silicatés de l'éruption du Vésuve (Avril, 1906). By A. Lacroix. Paris, Nouvelles Archives du Muséum, (4). Vol. IX. Pp. 1–172, 1907.

In this valuable and important work the foremost petrographer of France brings together many observations made by himself at eruptions of Vesuvius in 1893, 1905 and 1906, with results of great interest both for the study of volcanic eruptions from the physical side and of the petrography of their products.

In the first chapter a general sketch of the Vesuvian eruptions is given, followed by a detailed description of that of 1906. Two main types of eruption (both central) are distinguished: that of 1895, in which the effusion of lava is tranquil and extends over several months and that of 1872, in which it is violent and rapid, and lasts only a few days. The eruptions of the first type are constructive, so far as the cone is concerned, while those of the latter are destructive. A third, subsidiary type, rare at Vesuvius while the usual one at Etna, is that of 1760, characterized by excentric outflows, the other features being intermediate between those of the first two. The eruption of 1906 belongs to the type of 1872, ending a period of moderate activity which had lasted for nearly 32 years.

In the second chapter the new lavas are described petrographically in considerable detail, two chemical analyses being given, which resemble closely earlier ones of lavas of 1631, 1872 and 1903 made by the reviewer. The leucite phenocrysts appear to have formed