protein metabolism investigations, have such enlightening studies been published during any like period as during 1911 and the first half of 1912. The admirable work of Osborne and Mendel on the physiological rôle of the individual proteins, and of Folin and Denis on the fate of the products of protein digestion after absorption, came too late for inclusion in this edition.

The author has succeeded admirably in adhering closely to the physiological aspects of protein metabolism, a difficult task, when a vast amount of experimental data relating to the chemical aspects of the same subject is now available. This attitude is a desirable one at the present time, when there is a strong tendency on the part of text-book writers and dietitians to assume that an adequate supply of "building stones" in the diet is all that is essential to insure physiological well-being in the animal. The author has done a good service to his fellow workers in producing a treatise which will assist in creating new attitudes toward the problems concerned, and to the great number of teachers who follow the original literature to but a slight degree or not at all, in presenting in so clear a form, the experimental lines of inquiry directed toward the solution of problems of protein nutrition, and the different points of view to which these have led.

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Scientific Results of the Voyage of S. Y. "Scotia" during the Years 1902–1904. Vol. III., Botany. Edinburgh, The Scottish Oceanographical Laboratory. 1912. 4to. Pp. x + 153, 12 pl., 1 chart.

Nearly simultaneously with the publication of this volume, now dedicated to his memory, Sir Joseph Hooker, the dean of botanists and the author of the "Flora Antarctica," passed from his earthly labors. The botanical results of the Scottish National Antarctic Expedition are derived principally from two summer visits to the South Orkneys and a winter spent at Laurie Island in Scotia Bay; a hasty visit to Gough Island; extensive collections of the algæ of Weddell Sea; notes on the botany of Ascension Island; and incidental collections made on the outward and homeward voyages. The report on the phytoplankton will be issued later.

The present volume opens with an introduction by Dr. Rudmose Brown on the problems of Antarctic plant life. Recent explorations have shown that the South Polar flora is in some respects richer than has been supposed, though its chief interest is derived from its relations to the problems of geographical distribution and the origin of the Antarctic flora.

With the exception of a doubtful fossil of conifera, possibly of Devonian age, found in Victoria Land, the known Antarctic fossil plants are those obtained by Otto Nordenskjöld from Hope Bay, Graham Land, ferns, cycads and conifers indicating a warm moist climate and abundant vegetation in Jurassic times. The fossil *Araucaria, Fagus,* etc., found at Seymour Island by the same expedition indicate the extension of somewhat similar conditions into the Tertiary.

The most striking feature of the Antarctic flora is its poverty compared with that of the Arctic. Spitsbergen in summer in 79° north latitude supports a hundred species of flowering plants, while at the South Orkneys in only 61° south there is not a single species. In Grant Land, in 81° and 82° north latitude, Peary collected 57 mosses and 7 hepatics, more than are known from the whole Antarctic region south of latitude 60°.

The explanation lies chiefly in the fact that while the Arctic summer mean temperature is well above the freezing point, that of the Antarctic is practically always below it. Another factor is adverse to the establishment of plants on the few snowless patches of Antarctic land, namely, the presence of myriads of penguins, which cover these areas with their guano and trample them into mud whenever the temperature is above the freezing point. The few sheltered spaces where mosses occur are poorly suited to flowering plants. Yet that their introduction is possible by natural causes is indicated by the discovery of

pollen grains of the South American *Podocarpus* in the snow of South Orkney by Dr. Fritsch.

There are only two phanerogams known from the Antarctic, *Descampsia* and *Colobanthus,* which are the most southerly flowering plants known. There are no ferns, and mosses form the major terrestrial plant population, 52 species being known, of which 24 are endemic. The lichens are conspicuous, but few in species. The algæ, especially the unicellular kinds are abundant.

All the known facts, according to Dr. Brown, point to a Fuegian origin for the flora. A greater former extension of glaciation, which is well proved, is regarded as inimical to the descent of any part of the present flora from that of Tertiary times.

Beside the chapters on the botany of the South Orkneys, Gough Island and Ascension Island by Dr. Brown, Cardot contributes a general review of the mosses; Gepp, Holmes, Foslie and Fritsch treat of the fresh-water and marine algæ; and Harvey Pirie contributes notes on Antarctic bacteriology. The volume concludes with a useful bibliography of Antarctic botanical publications.

WM. H. DALL

A Text-book of Physics. Edited by A. WILMER DUFF. Third Edition. P. Blakiston's Son & Co. 1912.

The third edition of Duff's "Physics" is a great improvement typographically over the previous editions, and is consequently so changed that if it were not for the uniform binding of the three editions it would appear at first glance to be an entirely new book. Practically all the cuts have been made over from new drawings, with a noticeable increase in clearness and uniformity of size, or have been replaced by other and better ones. This, with the choice of better type, makes the reading much easier. As in the previous editions, the main subdivisions are by different men, but the order has been changed, "Wave Motion" coming after "Mechanics," and "Sound and Light" after "Electricity"; and there seems to be more unity of treatment in the whole and a natural connection between the parts which saves them from appearing as disjointed treatises. The text of the "Mechanics," by A. W. Duff, is practically unchanged from the previous edition, and the same may be said of "Wave Motion," by E. P. Lewis, and "Sound," by Wm. Hallock. "Conduction of Electricity through Gases and Radioactivity," by R. K. McClung, has a few changes and additions noticing some recent developments, but is otherwise unchanged. "Light," by E. P. Lewis, has been reduced in amount and improved by being partly rewritten and rearranged (though it previously possessed considerable merit). The portions on Heat and Electricity and Magnetism are entirely new. The part on Heat is by C. E. Mendenhall, of the University of Wisconsin, replacing that by K. E. Guthe in the other editions. The arrangement of the subject matter seems to be more logical and more briefly stated, and there is an improvement in the choice of illustrations, but in places there is less clearness of statement and treatment than in the previous edition. Nowhere is the improvement in the drawings more noticeable than in the case of "Electricity and Magnetism," by A. P. Carman, of the University of Illinois, which replaces that by A. W. Goodspeed in the previous editions and comprises also the former section by Professor Carman on Electromagnetic Induction, thus securing a desirable unity of treatment in this subject. Taken as a whole the parts of the book are remarkably well welded together, and, having as authors specialists in the different departments, it should rank among the best college texts of the day.

LOUIS A. PARSONS

Maschinen und Apparate der Starkstromtechnik (Machines and Apparatus for Heavy Currents). By GUSTAVE M. MEYER. Published by B. G. Teubner, of Leipzig and Berlin. 1912.

So rapid has been the development of machines and apparatus used in connection with the many applications of electricity to power purposes that it is well-nigh impossible