

treatment of which is most evidently insufficient, and among the Protozoa, Cœlenterata and Vermes much recent work of great importance is omitted. Thus it is hard to see why the Flatworms, which are both of general and also of special clinical interest, should have been passed over with merely three pages of text and no illustrations; and the dismissal of malarial organisms by the citation in a brief footnote of a few authorities generally inaccessible, does not conform to the purpose of the work or to the manner in which other topics are handled. These are, however, instances from chapters of which a few have not been revised in either of the recent editions of the book.

In general the work has been carefully and thoroughly revised and brings together in convenient form a mass of valuable material which can hardly be found in any other single volume. It is indispensable to the amateur worker with the microscope who wishes assistance or information on the many problems which arise in his work, while biologists and others to whom the microscope is a professional instrument will find it a reference book of real value.

HENRY B. WARD.

PERNTER'S METEOROLOGICAL OPTICS.

AN important work on the optical phenomena that occur in meteorology is announced from the press of Wilhelm Braumüller, of Vienna, viz., 'Meteorologische Optik,' by Professor J. M. Pernter. This work is the fruit of the author's studies for twenty years past and represents the lectures that he has delivered to students in the universities at Innsbruck and Vienna. He proposes to thoroughly work over a field in the physics of the atmosphere that is often neglected by meteorologists, although in many respects of importance to those who are studying the dynamics of the atmosphere. Although treatises on meteorological optics have been published by Clausius, Mascart and others, yet, it is to be expected that this volume by Pernter will be the first that has done justice to the subject. The whole work will be divided into four sections, relating respectively to the apparent

shape of the celestial vault; the phenomena due to the gaseous components of the atmosphere, such as refraction and scintillation; those due to haze or cloud, such as halos, glories, rainbows and the colors of the clouds; finally, the phenomena due to very small particles of any kind always existing in the air, such as the blue color of the sky, the polarization of skylight, twilight and the absorption of light in the atmosphere. The first section, price 2 Kroners, or 45 cents, has already appeared, covering 54 pages of large quarto, and shows us that the whole work, which will embrace about 480 pages, is eminently worthy of commendation.

C. ABBE.

SCIENTIFIC JOURNALS AND ARTICLES.

Bird Lore for March-April opens with a most interesting article by William Brewster on the 'Voices of New England Marsh,' in which we are given a picture of the cycle of life throughout the year as indicated by the voice of the residents. The second article, on 'Bird Clubs in America,' is by S. N. Rhoads, and tells of the Delaware Valley Club. Edith M. Thomas contributes a poem on the 'English Starling,' and the third paper on 'How to Name the Birds,' by Frank M. Chapman, treats of the orioles and finches. Lawrence F. Love tells of 'My Bluebirds,' and we have reviews, editorials and the Audubon Department to complete the number.

The Osprey for March has 'Notes of some Yellow-throated Vireos' Nests,' by William R. Maxon; 'The Birds of the Marianne Islands and their Vernacular Names,' by W. E. Safford; 'Notes of McCown's Longspur in Montana,' by P. M. Silloway; 'The Carib Grassquit (*Euethia bicolor omissa*),' by B. S. Bowdish and a 'Biographical Notice of John Cassin,' by Theo. Gill, besides shorter articles and reviews. The supplement on 'The General History of Birds' continues the description of the feathers.

The Museums Journal of Great Britain has a brief article on 'Museums and Teaching,' which is rather flattering to American museums, an article by W. H. Edwards on 'An Economical Method of Mounting Shells and

other Small Objects for Museums,' and the fourth instalment of 'Hygiene as a Subject for Museum Illustration' gives the scheme of arrangement for the domestic, communal and dwelling divisions. There are a description of 'The Stone-Age Gallery,' British Museum, and a note on the 'Transvaal State Museum,' from which it appears that England has granted about £8,000 for its completion. If Great Britain can give this sum for this far-away Museum, it would seem as if the United States with its claim to be the richest nation in the world might provide a new National Museum.

The *American Museum Journal* for March contains an abstract of the annual meeting of its trustees, a note on 'A Fossil Armadillo from Texas,' the program for 'The International Congress of Americanists' and a note on the remarkable beetle, '*Hypocephalus armatus* Desmarest.' The 'Guide Leaflet' accompanying the number is by J. A. Allen and is devoted to 'North American Ruminants.' It comprises twenty-eight pages, an account of the group, containing much information, and is abundantly illustrated from living animals and from the museum groups. The title page and index to Vol. I. of the *Journal* is also issued.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 353d meeting was held on Saturday evening, April 5.

Frank Baker and F. A. Lucas discussed the question, 'Is the Area of Muscle Insertion an Index of Muscular Power?' Frank Baker stated that it had been assumed in discussing the flight of birds that because one bird had a larger area of wing muscle than another it necessarily exerted much more power in flight, while there were other points to be considered, such as the character or quality of the muscle fibers and their nerve supply. Dr. Baker then proceeded, with the aid of numerous lantern slides, to show that the internal structure of muscle varied much, so that one muscle might have vastly more power than another of equal bulk, while again there might be a vast difference in the contractile power of the individual fibers. The rapidity with which a muscle

might contract and relax, and the energy or force it might expend in doing this, would be influenced by the manner in which the nerves were distributed, and this, the speaker showed, varied very much. The powerful water beetles were cited as affording an example of peculiar nerve distribution probably correlated with the exercise of great strength, and it was stated that investigation would probably show that there were decided differences of nervation between birds of rapid flight and those slow of movement, and that other factors besides mere area of muscle insertion entered into the question of power exercised by flying animals.

F. A. Lucas, in presenting his side of the question, said that while he agreed with Dr. Baker that the area of muscle insertion was not necessarily a measure of muscular power, in certain cases he thought it might be. In estimating the amount of power expended by birds in flight, he had used the area of the keel of the sternum as a rough index of the force used. Mr. Lucas explained that in all birds the main muscles that raised and depressed the wings arose from the sternum and acted in the same way. In birds which flew by strokes of the wings, and whose flight was undeniably powerful, the breast muscles and sternal keel were in direct ratio to the apparent force, while the muscle insertions on the humerus were also large. In birds which sailed, like the albatross, the sternal keel and breast muscles were small. In certain birds, such as the tinamous, the quality of the muscle was poor, although the quantity was ample, and in such cases the character of the humerus and its small attachments for muscles showed that such was the case. The speaker illustrated his remarks by diagrams of the humeri of various birds, and one showing the sternum of the albatross as it actually was and as it would be did the albatross employ a force proportionate to that of the humming-bird, concluding that he felt justified in using the size of the sternum in birds as a measure of the power used.

W. P. Hay presented a paper on 'The Subterranean Fauna of the United States,' illustrating his remarks with lantern slides. He showed the areas in which caverns occur, described the manner in which caverns are