Radiolaria. To be consistent, they should follow Haeckel, who has shown conclusively that the same reasoning which draws the Mycetozoa into the protozoan group would also draw the bacteria and fungi. This, however, they decline to do, and their classification of the Rhizopods is thereby weakened. The difficulty might have been avoided by introducing the questionable forms in an appendix under some name indicating their affinities to the plants. The same criticism might apply to their order Phytoflagellidæ. It is of value to show the connection of these plant-like forms to the Rhizopods and Flagellates, if for no other reason than to show the possible polyphylletic origin of Protozoa from Protophyta, but to make them equivalent to the well-defined animal groups seems to be a taxonomic error.

In classifying the Sporozoa the authors have left the beaten track and have taken advantage of the recent works of Labbé, Schneider and innumerable other investigators of this unfamiliar group to produce a new and apparently trustworthy classification in which the adult form is taken as the basis for the two main subdivisions—the Rhabdogeniæ (in place of Labbé's Histosporidæ and Cystosporidæ) and the Amœbogeniæ (equivalent to Bütschli's Myxosporidia).

One feature of the book which may be open to criticism is that nearly all of the figures taken from various special works are modified in some way to conform to the plan of schematization, and the reader is left with a feeling of uncertainty as to how much is real and how much imaginary, and he natuarally questions the degree of accuracy with which the authors draw the line between the two.

Another and a more important criticism touches the plan of presentation which is to be followed throughout the series. While there is undoubtedly much of value in the idea of their 'concrete' zoology for teaching purposes, there are important reasons why the method they adopt cannot give complete satisfaction. For example, one cannot resist a feeling of disapproval upon seeing an *Amœba proteus* described and pictured with the long reticulate and anastomosing pseudopodia of the Foraminifera in addition to its own lobose type; nor, indeed, a 'hypotrichous ciliate with the musculature of a heterotrichous form.' Such a method may be very successful in forcing upon the student a general idea of the group described, but the picture which he carries away with him may be of some form which does not actually exist in nature, while with that mental picture he carries a number of others which show deviations from the morphological type. It may be asked, then, if the confusion of pictures which the student gets is not as bewildering to him as the confusion of facts and exceptions in the 'abstract' type of text-book?

Finally, this work, although of undoubted value for teachers and specialists, is designed as a text-book for beginners, but, putting aside all considerations of method and merit, the mere size of any zoology which begins with 470 pages on the Protozoa and which promises to fill a large number of volumes is out of reach of the student, and he must continue to seek a text-book, probably of the 'abstract' type, which is condensed, simple, interesting and scientifically accurate.

GARY N. CALKINS.

DEPARTMENT OF ZOOLOGY,
COLUMBIA UNIVERSITY, NEW YORK,
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Sleep: Its Physiology, Pathology, Hygiene and Psychology. By MARIE DE MANACÉINE (St. Petersburg). Contemporary Science Series. Imported by Charles Scribner's Sons, New York. 1897. Pp. 335.

This work, already published in Russian and French, now appears in English, enlarged and revised by the author herself. It is a brief and somewhat popular summary of the best that is now known about the physiology, pathology, hygiene and psychology of sleep. The author's own investigations supplement a very wide range of reading on the subject. A classified bibliography enumerates about 550 books and articles pertaining more or less directly to sleep.

The one constant physical accompaniment of sleep is arterial, particularly cerebral, anæmia, with venous congestion, particularly congestion of the vessels of the skin, with dilatation of the arms and legs. The plethysmographic experi-

ments of Patrizi, Hill, Mosso and others are reviewed. The internal organs, stomach, kidneys, etc., may be in full activity during profound sleep. As regards the nervous system the inactivity is found in the centers rather than in the nerve and cord. The brain is in a collapsed, pale condition. The special senses may any of them be active, while walking, talking, and other movements are not incompatible with sleep. Even the brain may be active in some of its parts.

The various theories as to the cause of sleep are discussed and criticised. The vasomotor theories find sleep to be caused directly by the withdrawal of the blood from the brain, or indirectly by the relaxation of tone in the vasomotor center controlling the skin vessels, producing dilatation of the latter and anæmia at the centers. The chemical theories attribute sleep to the impoverishment of oxygen in the brain, or to the poisonous presence of carbonic acid or of leucomaines. Some recent histological theories of sleep explain it by assigning certain amœboid characters to the cerebral cells or to the cells of the neuroglia, the retraction of the ramifications of these cells resulting in isolation and inactivity of the nervous elements. In place of any of these theories the author herself very naively substitutes a psychical theory based upon the formula: Sleep is the resting time of consciousness. Hence we notice that those in whom consciousness is feebly developed, savages, infants, less cultured adults, require more sleep than others.

Under pathology, the writer treats of insomnia, syncope, excessive sleep, hibernation, narcolepsy, catalepsy, hypnosis, latah and somnambulism. In all of these the discussion is brief and presents nothing striking. Under hygiene, attention is called to the dangers of too much sleep to persons of all ages. In children it develops the vegetative life of the organism at the expense of the central nervous system. In boys and girls it is apt to lead to albuminuria. In adults it enfeebles the brain. Likewise, the half-waking state, hypnosis, the use of alcohol or narcotics, are all injurious, as they tend to produce an enfeebled consciousness. We should rise late in winter and early in summer. In the case of children perfect uniformity in the time of retiring and rising should be avoided.

Under the psychology of sleep, dreams are treated at some length, as to their classification, causes and peculiarities. The strangeness of dreams, as well as the criminal nature that they sometimes assume, is accounted for by their atavistic character. In dreams our personal, fully developed consciousness is asleep, while latent tendencies transmitted by our farthest ancestors tend to revive. "A good and peaceful man may awake in horror with forehead bathed in sweat from a dream in which he has been transported into some strange and antipathetic environment in which he has committed a barbarous and cruel deed, not altogether abnormal, but fully possible in the far past of humanity."

G. T. W. Patrick.

University of Iowa.

Societies and Academies.

New York Academy of Sciences—Section of Biology—Meeting of January 10, 1898.

Professor Osborn spoke as follows on the Origin of the Mammalia: Huxley's hypothesis (1880) deriving the Hypotheria or Promammalia from ancient Amphibia contrasts with Cope's (1884), which substituted carnivorous reptiles of the Pelycosaur type included in his order Theromora. Baur (1886) placed the Theromora as a parallel phylum with the mammalia springing from Sauromammalia of the Permian. Osborn (1888) proposed the Protodonta as archaic mammals transitional to reptiles, and later (1893) adopted Baur's views as to the Theromora. More recently Baur has removed the Pelycosauria from the Theromora entirely, and thus speculation by the late Professor Cope, Baur and Osborn as to the origin of mammals turns back to the true Theromora, namely, the *Dicynodontia* and *Theriodontia* of Owen, a group which Professor H. G. Seeley has described in his numerous memoirs. Among these Permian reptiles of South Africa we find a remarkable assemblage of characters which comparative anatomy and paleontology have led us to anticipate in the hypothetical promammal. Osborn (1888 and 1893) described the probable