

the diagram of chemical activities is largely suppositious, and that substances may be located here and there, with no indication decisive of synthetic or analytic origin.

The author includes many energy liberating processes under respiration, whether attended by excretion of CO_2 or not, and emphasizes the fact that it is only a link in the chain of metabolic metamorphoses. It is, therefore, not always possible to determine the subjects or products of respiration.

A comparison of the editions of 1881 and 1897 reveals the fact that Professor Pfeffer no longer deals with the organism as a purely chemical and physical machine, but regards it from a physiological point of view. Nowhere is this more vividly apparent than in a paragraph dealing with translocation, which is freely translatable as follows: "In general, translocation is regulated by the vital activity. By this the functioning apparatus is controlled, and apparently the organism is capable of modifying the permeability of the protoplast temporarily in many ways. Indeed, it is not improbable that the living protoplast, by its own activity, not only conducts solid particles and oil drops, but also under some circumstances dissolved substances for which it is not diosmotic. Furthermore, diosmose is not dependent entirely upon the size of the dissolved molecules, since many colloids may be easily taken up and given off."

The terse, vigorous, concise style and generally high literary quality make this volume a classic in botanical literature. The author has rendered an inestimable service to biological science by his masterly criticism and arrangement of the accumulated results of research upon the physiology of the vegetal organism, and his vivid clear-cut delineation of the problems awaiting investigation will give a new impetus to research in this and related lines.

Arrangements have already been made for the translation of the book into French and English. The English edition will be prepared under the direction of Dr. Ewart, whose intimate acquaintance with the author and important researches in the Leipsic Institute make him especially well fitted for the task.

D. T. MACDOUGAL.

Trail and Camp Fire, the Book of the Boone and Crockett Club. Editors: GEORGE BIRD GRINNELL and THEODORE ROOSEVELT. New York, Forest and Stream Publishing Co. December, 1897. 8vo. Pp. 353. Illustrated. Price, \$2.50.

Beginning in 1893, the Boone and Crockett Club has published on alternate years a volume made up of articles on big game and big game hunting, with tales of exploration in little known lands. While written primarily for the sportsman, these books contain much of interest to the naturalist; and to the student of the larger mammals they are indispensable. The new volume, 'Trail and Camp Fire,' contains the following: 'The Labrador Peninsula,' A. P. Low; 'Cherry,' Lewis S. Thompson; 'An African Shooting Trip,' Wm. Lord Smith; 'Sintamaskin,' C. Grant LaFarge; 'Wolves and Wolf Nature,' George Bird Grinnell; 'On the Little Missouri,' Theodore Roosevelt; 'Bear Traits,' George Bird Grinnell, J. C. Merrill, Theodore Roosevelt and Henry L. Stimson; 'The Adirondack Deer Law,' Wm. Cary Sanger; 'A Newfoundland Caribou Hunt,' Clay Arthur Pierce; 'Origin of the New York Zoological Society,' Madison Grant. To these is added a chapter on 'Books on Big Game'—one of the most entertaining and useful in the volume—treating of the more important works on big game hunting in Africa, India and America.

Trustworthy information relating to the interior of the Labrador peninsula is so scarce that Mr. Low's article will be widely welcomed and will reach a different audience from his much more elaborate official report (Annual Report Geological Survey of Canada, N. S., Vol. VIII., pp. 1-387, Ottawa, 1897). It is a pity that his important notes on big game are marred by antiquated and inaccurate nomenclature.

Without attempting to point out the many good things in the book, it may be said that the chapters on Wolves and Bears are intensely interesting, and that Mr. Wm. Lord Smith's account of his 'African Shooting Trip,' in company with Dr. A. Donaldson Smith, is an important addition to the literature of the rapidly diminishing game of the 'Dark Continent.'

The editors' statement that "coyotes try to

catch and eat badgers" seems to need some sort of qualification. The reviewer and at least one of his associates have on several occasions seen coyotes and badgers cross each other's tracks, without the slightest show of fear or aggressiveness on either side; and persons familiar with the strength, ferocity and resisting powers of the badger can hardly imagine a coyote rash enough to meddle with one. Of course, a hungry coyote might tackle a young or enfeebled badger, but in the case of adults in ordinary health and spirits it is hard to believe that a coyote would ever invite such a terrible contest.

'Trail and Camp Fire' is a storehouse of information for the sportsman-naturalist and a worthy companion of 'American Big Game Hunting' and 'Hunting in Many Lands,' its predecessors in the Boone and Crockett series.

C. H. M.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 480th meeting was held at the Cosmos Club on Saturday evening, February 19th, at 8 p. m. The first paper was by Mr. H. A. Hazen on 'The Origin and Value of Weather Folk-lore.' In substance Mr. Hazen said: "A weather saying or sign to be of value should be based on a sufficient number of coincidences between the sign and the supposed resulting weather to make it a law." It was shown that four-fifths at least of the current weather signs and proverbs could not be regarded laws. "The earliest of these signs, some think, is in Job [Canst thou bind the sweet influences of the Pleiades], but this refers only to the fact that, before the calendar month and year were established, the rising and setting of the constellations were taken by the ancients to mark the seasons and the times of sowing and harvesting. There is no thought that the Pleiades have any direct influence upon terrestrial conditions. Hesiod (850 B. C.) gives the cuckoo (rain crow) sign of rain, and it is a little remarkable that this early sign has come down through the ages as the best animal sign of rain."

The author spoke of pseudo weather lore; signs from the moon (universal in civilized

nations); from the planets, which may be brought down to the planetarians of the present day; from eclipses, clouds, halos; from animals, birds, etc.

The second paper was by Mr. W. H. Dall, who spoke on the condition of Tertiary Paleontology in the United States. The speaker restricted himself to a consideration of the fossil invertebrates of marine origin. He briefly sketched the history of this branch of American science, from its beginnings with Say, Morton, Lea and Conrad, to the present time, showing how, after the energy of the earlier Philadelphia school had spent itself, a period of comparative inaction set in, which had now given way to renewed activity, which is gradually placing this branch of the science on a modern basis. This awakened interest is largely due to the initiative of the Wagner Free Institute of Science in Philadelphia and the extension of the work of the United States Geological Survey to the coastal plain and phosphate regions of the Southern States.

E. D. PRESTON,
Secretary.

ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO, MEETINGS OF DECEMBER AND JANUARY.

Maturation and Fertilization of the Egg of Arenicola Marina. In the earliest stage in which centrosomes have been seen, there are two, at some distance from each other in the cytoplasm, each surrounded by a small, deeply staining area, and few, very delicate radiations. The rays elongate, a large spindle is formed, and the centrosomes, now lying free in the cytoplasm, arrange themselves upon it. In approaching its definitive position at the periphery of the egg, this first polar spindle contracts to about one-half its original length. The centrosomes at each pole divide as the separation of the chromosomes begins. The two centrosomes at the inner pole form the poles of the second polar spindle. They move apart, showing a central spindle, new asters appear, and the spindle assumes the position occupied by the first polar spindle.

After the formation of the second polar body the female pronucleus is formed, and the 'female' centrosome and aster disappear. The sperm apparently enters at any point, but cannot be