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MSS. intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y.

PRESENT PROBLEMS OF GEOPHYSICS.[*]

ADVANCES in science are seldom made without a view to the solution of specific, concrete problems, even when the results of investigation possess the widest generality. The history of science is full of instances of the fruitfulness of researches the immediate purposes of which were narrowly defined. Geophysics is only that portion of general physics, including under that term physical chemistry, which is applicable to the elucidation of the past history and present condition of the earth. It is thus a very definite branch of applied science, the exigencies of which call for the solution of a group of related problems. These, however, possess great interest apart from their application to the globe, while for the most part they offer very serious experimental and theoretical difficulties. Had they been easy, they might have been solved long ago, for many of these problems have been propounded and more or less discussed from the birth of modern science to the present day. Their difficulty, not lack of recognition of their importance, has postponed their solution.

The main purpose of this paper is to deal with the order in which it would be expedient to investigate the questions embraced under the head of geophysics, but a brief and incomplete enumeration of the problems from a geological standpoint will serve to lend a coherency and a human

[*] Address delivered at the International Congress of Arts and Science, at St. Louis, before the Geophysical Section of Department 12, on September 21, 1904.

SCIENTIFIC JOURNALS AND ARTICLES.

The Botanical Gazette, for October, contains the following articles: Bradley M. Davis has discussed the relationships of sexual organs in plants, presenting their classification based upon certain evolutionary principles and also suggesting a terminology that is more precise.—Bruce Fink has contributed another paper upon the 'ecology' of a lichen society, this time considering a curiously isolated society upon a sandstone riprap in Iowa.—J. Y. Bergen has given some results of his observations in Italy on the transpiration of sun leaves and shade leaves of the olive and other broad-leaved forms, showing in general that xerophytic leaf structure is not always incompatible with abundant transpiration.—A. S. Hitchcock, in his fourth paper, entitled 'Notes on North American Grasses,' discusses *Poa serotina* Ehrh. and *P. flava* L., and also the genus *Digitaria Heist.*—F. L. Stevens has made a further contribution to our knowledge of oogenesis and fertilization in the genus *Albugo* by presenting his results with *A. Ipomoeae-Panduranae.*

THE September issue of the journal of *Terrestrial Magnetism and Atmospheric Electricity* has as its frontispiece the portrait of Alexander von Humboldt, and contains besides notes and abstracts and titles of recent publications, the following articles:

N. UMOW: 'Die Construction des Geometrischen Bildes des Gauss'schen Potentials, als Methode zur Erforschung der Gesetze des Erdmagnetismus.'

L. A. BAUER: 'The Physical Decomposition of the Earth's Permanent Magnetic Field, No. IV.' a. Introductory Note; b. Secular Motion of a Free Magnetic Needle; c. Vertical Earth-Air Electric Currents; d. Residual Magnetic Field and Diurnal Variation Field.

L. A. BAUER: 'Appeal for Cooperation in Magnetic and Allied Observations during the Total Solar Eclipse of August 29–30, 1905.'

W. VAN BEMMELEN: 'Magnetic Survey of the Dutch East Indies.' (Second Communication.)

J. DE MOIDREY: 'Note sur l'Amplitude de l'Oscillation diurne de la Déclinaison Magnétique et son Inégalité Annuelle.'

G. W. LITTLEHALES: 'Magnetic Declinations by Peary in the Arctic Regions, 1900–02.'

W. F. WALLIS: 'Principal Magnetic Disturbances recorded at Cheltenham Magnetic Observatory, May 1–August 31, 1904.'

DISCUSSION AND CORRESPONDENCE.

THE STOMACH STONES OF THE PLESIOSAURS.

APROPOS of Dr. Eastman's letter on the 'stomach stones' of the plesiosaurs, published in SCIENCE, No. 510, p. 465, permit me to state that there is not a shadow of doubt that the plesiosaurs, both Cretaceous and Jurassic, had the habit of swallowing such stones. At least thirty instances are now known of the occurrence of the very peculiarly worn pebbles between the ribs or with the remains of plesiosaurs in both Europe and America. The fact was first published by Professor Seeley, of England, in 1877, and Seeley it was who first suggested their use in digestion and the possession of a 'gizzard' by these animals. This absolves Mr. Brown. Crocodiles are frequently reported to have like habits, and Buckland says that the Arabs determine the age of these animals by the number of the stones found in the stomach, one being swallowed each year! Similar pebbles have also been found with the remains of extinct crocodiles, and St. Hilaire gives a minute account of such instances. I need not say also that there are various accounts in the literature of like habits possessed by some of the seals and sea-lions. I doubt not that the habit was an intentional one with the plesiosaurs, nor do I think that Dr. Eastman would doubt either, had he ever collected the remains of these animals in the field. That the plesiosaurs had a gizzard-like stomach I do not believe, but I see nothing startling in the suggestion—with due apologies to Dr. Eastman. His argument, that, if the plesiosaurs were of lithophagous proclivities, other reptiles should be expected to gorge themselves on a like mineralogical diet is hardly pertinent. The prairie chicken has the regulation gallinaceous gizzard, and, therefore, the sage hen should have one. But it has not. *Ab uno disce omnes* is not always safe. And, it must be remembered, all reptiles have stomachs with thick muscular walls.

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