

shall be attempted only for the region covered by the work of the College Entrance Examination Board of the Middle States and Maryland, and of the corresponding New England board if formed.

c. That the committee be authorized to draw upon the secretary-treasurer for its expenses of printing, etc., up to a limit of \$20.00.

The Society voted to approve this plan with the proviso that the Committee should submit to the members by mail a preliminary printed report, and should be guided by any opinion submitted by a majority of the members. The president appointed Messrs. Ganong, Lloyd and Atkinson such a committee. The preliminary report of the committee is now ready, and will be sent to members of the Society and to others known to be interested. Others wishing to see the report may obtain copies by application to the writer. The appearance of the final report will be announced through *SCIENCE*.

W. F. GANONG.

SMITH COLLEGE, NORTHAMPTON, MASS.

THE MICHIGAN ACADEMY OF SCIENCE.

THE seventh annual meeting of the Michigan Academy of Science was held at the University of Michigan, Ann Arbor, March 28th, 29th, and 30th, under the presidency of Professor Chas. E. Barr, of Albion College.

The general session of Thursday afternoon, March 28th, was devoted to the geological and archeological surveys of the State. The Secretary read a paper by Mr. Harlan Smith, of the American Museum of Natural History, on 'An Archeological Survey of Michigan,' and Mr. Geo. W. Bates, president of the Detroit Archeological Society, presented a second paper by Mr. Smith, on 'The Antiquities of Michigan, Their Value and Impending Loss.' This paper described many of the archeological remains of Michigan, and urged that steps should be taken to preserve them. (At a later meeting the Academy endorsed a bill now before the Legislature, providing for an archeological survey of the State.)

Dr. A. C. Lane presented a paper (read by the Secretary) on 'Recent Work of the State Geological Survey,' and Mr. Frank Leverett, of the U. S. Geological Survey, gave an account of 'Glacial Investigations in Michigan.' These papers showed that the Government and State Surveys are cooperating, and supplementing each other's work in many respects. The State Survey is devoting itself chiefly, in the lower peninsula, to the study of marl, and to a correlation of the various coal seams; in the upper peninsula to a correlation and study of the copper-bearing lodes. Mr. Leverett's paper presented certain economic and scientific results of the U. S. Geological Survey, particularly in the mapping and interpretation of topographic features, and in variations in the structure of glacial deposits. The successive positions of the margin of the glacial ice were shown to be marked by moraines or massive belts of rolling country which are found to sweep around the basins of Lake Michigan, Saginaw Bay and Huron-Erie. These carry on their outer borders more or less extensive plains of gravel and sand, which were formed by the outflowing waters of the melting ice-sheet. The distribution of these moraines and bordering gravel plains indicates that the first counties of Michigan to be uncovered by the melting back of the ice are Branch, St. Joseph, Kalamazoo and Calhoun, and the water from the ice then flowed to the Kankakee River, past South Bend, Ind. The ice margin melted back from these counties toward the lake basins to the west and north and east, and after a time it shrunk within the present limits of the Great Lakes. The lake history connected with the present system of Great Lakes is very complicated and as yet but partially worked out.

The Academy then divided into sections of botany, zoology, sanitary science and agriculture, and sectional meetings were

held on Thursday afternoon and Friday forenoon, under the chairmanship of the sectional vice-presidents.

In the Botanical Section, Professor C. F. Wheeler, chairman, the following papers were read :

'The Perception Zone of Roots': DR. FREDERICK C. NEWCOMBE, Ann Arbor.

'Transition from Stem to Root in *Echinocystis lobata* Torr. & Gray': DR. JAMES B. POLLOCK, Ann Arbor.

'Zygomorphy of *Styloidium adnatum* R. Br.': GEORGE P. BURNS, Ann Arbor.

'Adaptation of *Solanum Dulcamara* L. to Aquatic Conditions': THERESA G. WILLIAMSON, Ann Arbor.

'Ecological Study of a Glacial Lake near Ann Arbor': HOWARD S. REED, Ann Arbor.

'Aerotropism of Roots': MAY ELLA BENNETT, Ann Arbor.

'A Disease of the White Birch': JOHN LARSEN, Ann Arbor.

'Conditions influencing the Vitality of Seeds': JOSEPH W. T. DUVÈL, Ann Arbor.

'Interfoliar Scales of Monocotyledonous Aquatics': MINNA C. DENTON, Ann Arbor.

'Something concerning the Forests of Northern Michigan.' With lantern views: DR. W. J. BEAL, Agricultural College.

'Notes on the Flora of Eaton County': PROFESSOR HUBERT LYMAN CLARK, Olivet.

'The Dwarf Mistletoe in Northern Michigan': PROFESSOR CHARLES F. WHEELER, Agricultural College.

'The Relation of Algæ to Marl': PROFESSOR CHARLES A. DAVIS, Alma.

'A Noteworthy Occurrence of *Wolffia*': PROFESSOR CHARLES A. DAVIS, Alma.

'Notes on *Utricularia cornuta* Michx.': PROFESSOR CHARLES A. DAVIS, Alma.

'Notes on Michigan Saprophytic Fungi': B. O. LONGYEAR, Agricultural College.

'New Species of Michigan Fungi': B. O. LONGYEAR, Agricultural College.

'A Sclerotium Disease of the Huckleberry': B. O. LONGYEAR, Agricultural College.

'Causes inducing Asparagus to take its Form of Growth': L. LENORE CONOVER, Detroit.

In the Zoological Section, under the chairmanship of Mr. Bryant Walker, of Detroit, papers were given as follows :

'Phototaxis in Amphipods': DR. S. J. HOLMES, Ann Arbor.

'Preliminary Report on the Molluscan Fauna of the Region about Ann Arbor': MR. H. E. SARGENT, Detroit.

'Suggestions for a Method of Studying the Migrations of Birds': MR. L. J. COLE, Ann Arbor.

'The Occurrence of *Ammocetes*, the Larval Form of *Lampetra wilderi*, near Ann Arbor': MR. D. C. SCHAFFNER.

'Some Aspects of the Electrotactic Reaction of Lower Organisms': MR. RAYMOND PEARL.

'A Curious Habit of the Slug, *Agriolimax*': MR. RAYMOND PEARL.

'The Effect of very Intense Light on Organisms': MR. RAYMOND PEARL and Mr. L. J. COLE.

'Certain Reactions of the Common Slug, *Agriolimax campestris*': MR. RAYMOND PEARL and MISS MAUDE M. DEWITT.

'Some Further Notes on the Breeding Habits of *Amia*': PROFESSOR JACOB REIGHARD.

'On the Anterior Head Cavity of the Elasmobranchs': PROFESSOR JACOB REIGHARD.

'On the Early History of the Auditory and Lateral Line Organs of *Amia*': CORA J. BECKWITH. Read by Jacob Reighard.

'The Classification of Birds': PROFESSOR HUBERT L. CLARK, Olivet.

'The Breeding Habits of Holothurians': PROFESSOR HUBERT L. CLARK, Olivet.

'Death from the Bite of the Water Moccasin, *Agkistrodon piscivorus*': PROFESSOR WALTER B. BARROWS, Agricultural College.

'Birds of the Carolinian or Upper Sonoran Zone in Michigan': PROFESSOR WALTER B. BARROWS, Agricultural College. Read by title.

In the Section of Sanitary Science, Hon. Frank Wells of Lansing, chairman, the following papers were read :

'A Bacteriological Study of an Epidemic among Guinea Pigs': LOUIS M. GELSTON, Ann Arbor.

'Fränkel's Pneumococcus found in a Case of Tonsillitis': W. G. CARHART, Ann Arbor.

'The Detection of Boric Acid in Milk': W. H. VEENBOER, Ann Arbor.

'The Detection of Formaldehyde in Milk': A. J. HOOD, Ann Arbor.

'The Toxin of the Colon Bacillus': DR. V. C. VAUGHAN, Ann Arbor.

'Some Results of Public Health Work': HON. FRANK WELLS, Lansing.

'Biological Problems in the Prevention of Certain Diseases': DR. HENRY B. BAKER, Lansing.

In the Section of Agriculture, J. A. Jeffery, chairman, Dr. W. J. Beal gave a

paper on 'Some Relations of Botany to Agriculture,' and Mr. Kenyon Butterfield gave a talk on 'Some New Phases of Agricultural Education.'

On Friday afternoon a joint session of the Academy and the Biological Section of the Michigan Schoolmasters' Club was held in the University Museum. This session was largely devoted to the pedagogical aspects of the biological sciences. The papers given were as follows:

'Nature Study.' Presidential Address: PROFESSOR CHARLES E. BARR, Albion.

'How Shall a Young Person Study Botany?' DR. W. J. BEAL, Agricultural College.

'Outline for a Year's Work in Botany': L. LENORE CONOVER, Central High School, Detroit.

'Suggestion for a Year in Zoology': MISS ANDRÉ, Central High School, Detroit.

'Value of Supplementary Experiments': DR. LEWIS MURBACH, Central High School, Detroit.

'Science in the High School': MISS PALMER, High School, Lapeer.

'Recent Work and Theories on Fertilization of Animals': DR. S. J. HOLMES, Ann Arbor.

'Recent Work and Theories on Fertilization of Higher Plants.' Illustrated by Lantern Slides: DR. J. B. POLLOCK, Ann Arbor.

'The Proposed Topographic Maps of Michigan': DR. ISRAEL C. RUSSELL, Ann Arbor.

Two evening lectures were given before the Academy. On Thursday evening, Professor H. S. Carhart of the University of Michigan lectured on 'The Place of Physics in a Liberal Education,' and on Friday evening, Professor F. H. Herrick of Western Reserve University gave an illustrated lecture on 'The Haunts and Habits of Wild Birds.'

At the business meeting Saturday morning a committee was appointed to confer with corresponding committees from other scientific societies of the State, with a view to the affiliation of the other scientific bodies of the State with the Academy. The Academy voted also to endorse the bill now before the Legislature for an archeological survey of Michigan. The following officers were elected for the coming year:—

President, Professor Victor C. Vaughan, University of Michigan; *Vice-President*, for Botany, Professor C. F. Wheeler, of the Michigan Agricultural College; for Zoology, Professor Hubert Clark, of Olivet College; for Sanitary Science, Hon. Frank Wells, Lansing; for Agriculture, Professor J. A. Jeffery, of the Michigan Agricultural College; *Treasurer*, Professor Wm. H. Munson, Hillsale College; *Secretary*, Dr. James B. Pollock, University of Michigan.

A considerable number of new members were elected at this meeting; the sessions were well attended, and great interest was manifested in the work of the Academy. Altogether the meeting was the most successful and interesting in the history of the Academy.

H. S. JENNINGS.

SCIENTIFIC BOOKS.

Traité d'astronomie stellaire. Par CH. ANDRÉ.

Directeur de l'observatoire de Lyon. *Première partie: Etoiles simples.* 1899. Pp. xvi + 344. *Deuxième partie: Etoiles doubles et multiples. Amas stellaires.* Paris, Gauthier-Villars. 1900. Pp. xxiv + 429.

This excellent work seems to have attracted less attention than it deserves. It has the distinction of filling a gap in the literature of the subject. It covers ground which is common to both astrophysics and astronomy of position, as treatises are now more and more compelled to do; for in spite of the increase of specialization, the distinction in results obtained by astrophysical and astronomical methods is becoming slight. What, for instance, is an essential difference between the two components of the actual linear motion of a star, although the one is determined purely by the processes of astronomy of position, while the other is measured by the spectroscope?

The opening chapter of Professor André's first volume deals with objectives and mirrors, a topic upon which he is especially well fitted to speak. The sections treat of the theory of optical images, of the effect of diffraction screens or diaphragms over the objective, and of images