

SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

CERTAIN RECENT ATTEMPTS TO TEST THE NEBULAR HYPOTHESIS.*

It is a far cry from the glacial period to the nebular hypothesis, but yet it is not beyond the view hulloa of logic. Glacial periods have certainly been dependent on atmospheric states, whatever else may have been concerned in causing them. Surely no one will imagine glaciation in the air of the putative molten earth, nor in the warm dense atmosphere currently assigned to the early ages, nor yet in the later periods when figs and magnolias grew in Greenland. If carbon dioxide has the thermal qualities which eminent physicists assign it, continental glaciation could scarcely have occurred while it was a large constituent of the atmosphere. Now the atmosphere has,

* This paper, prepared at the request of the editor of SCIENCE, is little more than an abstract of the following three papers:

I. 'A Group of Hypotheses bearing on Climatic Changes,' by T. C. Chamberlin; *Journal of Geology*, Vol. V., No. 7, 1897, pp. 653-683.

II. 'An Attempt to test the Nebular Hypothesis by the Relations of Masses and Momenta,' by T. C. Chamberlin; *Journal of Geology*, Vol. VIII., No. 1, January-February, 1900, pp. 58-73.

III. 'An Attempt to Test the Nebular Hypothesis by an Appeal to the Laws of Dynamics,' by F. R. Moulton; *Astrophysical Journal*, Vol. XI., No. 2, March, 1900, pp. 103-130.

By 'nebular hypothesis' the gaseous hypothesis of Laplace is always to be understood in this article. The arguments, for the greater part, apply also to all spheroidal hypotheses in convective equilibrium, whether gaseous or meteoroidal.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for July has for its first article some 'Notes on a Species of *Pelomyxa*,' by H. V. Wilson, which he names *P. carolinensis*. H. L. Osborn describes at length 'A Remarkable Axolotl from North Dakota,' but omits to give it a name, while W. M. Wheeler makes an important contribution to our knowledge of the driver ants under the caption 'The Female of *Eciton Sumichrasti* Norton,' with some Notes on the Habits of Texan *Ecitons*. James A. G. Rehn discusses 'The Linnæan Genera *Myrmecophaga* and *Didelphis*,' concluding that *Myrmecophaga* is the generic name for the tree ant-eater, *M. tetradactyla* and proposing the name *Falcifer* for the great ant-eater, while *Didelphis opossum* is the type of that genus. C. R. Eastman reviews 'Karpinsky's Genus *Helicoprion*,' and in Part XI. of 'Synopsis of North American Invertebrates,' Mary J. Rathbun furnishes the keys for 'The Catometopous or Grapsoid Crabs.' The Reviews are numerous and good.

IN *The Plant World* for July, Alice Carter Cook concludes her series of papers on 'Coffee Growing and Coffee Drinking'; Frank E. McDonald describes 'A Sand Dune Flora of Central Illinois'; C. F. Saunders propounds the query, 'Does the Catch-fly Grass catch Flies?' and E. J. Hill describes the habitat of 'Primula Mistassinica.' A. H. Curtiss discusses 'Some Nameless Plants' of Florida, and C. F. Saunders in the 'Etymology of Columbine,' suggests that it may come from *columbarius*, a dove cote. In the supplement devoted to 'The Families of Flowering Plants,' Charles L. Pollard continues a description of those of the order Fari-nosæ.

THE June number of the *Ottawa Naturalist* which constitutes No. 3 of Volume XIV. has just been issued by the Ottawa Field-Naturalists' Club. Among the interesting articles it contains we note one by Mr. Frank T. Shutt, chemist to the Dominion Experimental Farms, on 'Soils and the maintenance of their fertility through the growth of legumes.' This paper draws attention to investigations carried on in the fields and laboratories of the Experimental Farm with signal success. The

improvement of soils through the growth of legumes has yielded results of the highest value to those who wish to maintain or recover the productiveness of their land. The next paper describes 'The Labrador Flying Squirrel.' Mr. J. D. Sornborger, of Cambridge, Mass., received three specimens of a flying squirrel from Rev. W. W. Perrett, of Makkovik, Labrador. These specimens on examination proved to be distinct from other species and have received the following name, constituting the new sub-species the 'Labrador Flying Squirrel' (*Sciuropteros sabrinus Makkovikensis*). Mr. Walter S. Odell, of Ottawa, contributes an article on 'The two-lined salamander' (*Spelerpes bilineatus*). A short note of the occurrence of the Squid in St. John Harbour, N. B., by Dr. Ami then follows, in which the writer points out that in Sept., 1899, the harbor of St. John and shores adjoining were literally infested with an unprecedentedly large school of squid. The same writer adds a brief note on some British American Echinodermata recorded in the *Challenger* Report on these organisms.

The Canadian Record of Science for January, 1900, which forms No. 3 of Volume VIII., contains the following papers and contributions to science: 'Sir John William Dawson,' by Professor Frank D. Adams, being an able though brief sketch of the life of that great Canadian scientist. It is followed by a letter from Sir J. William Dawson to the corresponding secretary of the Natural History Society and forms the last communication which he gave to that Society which for so many years he upheld by virtue of his own hard work and energies. 'Notes on some of the formations belonging to the Carboniferous system in Eastern Canada,' by H. M. Ami, in which the author discusses some of the problems involved in the classification of the different members of the Carboniferous in Nova Scotia. 'The flora of the Rocky Mountains,' by Rev. Robt. Campbell, M.A., is a contribution to botany of the Canadian Rocky Mountain belt in the broadest acceptance of the term. 'North American Goldenrods,' by Rev. Robt. Campbell, enumerates the different species and varieties of the genus *Solidago* contained in the herbarium of the Natural History

Society Montreal, most of which were obtained in Canada. Two species of the genus *Euthamia*, *E. graminifolia*, the bushy goldenrod, and *E. Caroliniana*, a slender fragrant goldenrod, were added. A review of Dr. Whiteaves's paper on the 'Devonian System in Canada,' by Dr. H. M. Ami, and one on 'Dr. A. E. Barlow's report on the geology and natural resources of the Lake Nipissing and Lake Temiscaming district of Ontario and adjoining portions of Quebec,' by Dr. F. D. Adams are then given. These are followed by a review of Mr. Lambe's 'contributions' to Canadian paleontology, Vol. 4, Pt. 1, on paleozoic corals, by Dr. F. D. Adams, and a synopsis of the annual report of the Geological Survey of Canada, Vol. 10, by Dr. H. M. Ami. The volume concludes with the abstracts of meteorological observations taken at McGill College Observatory, Montreal, for the year 1899.

SOCIETIES AND ACADEMIES.

ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO.

MEETINGS OF THE SPRING QUARTER, 1900.

AT the first meeting of the quarter, April 11th, Professor C. B. Davenport read a paper entitled 'Variation in *Pectinella*' giving the results of a statistical study of the spines of the statoblasts. An abstract of this paper has appeared in an earlier number of SCIENCE. The session of April 25th was devoted to a paper by Dr. C. M. Child on 'Abnormalities in Cestodes.' The abnormalities described were selected from a number of specimens of the sheep tape-worm *Moniezia expansa*, most of them occurring in a single specimen in which over a hundred abnormal proglottids were found. The proglottids of this species are very short and wide with a set of genital organs and a pore on each side. The variations range from the simple incomplete separation of proglottids to long spiral proglottids, making seven turns about the body. In many cases very different form-relations occur upon the dorsal and ventral surfaces. The most interesting point in connection with the abnormal segments is the structure of their genital organs. All the organs show a very distinct correlation in form and structure with the form of the proglottid,

i. e., a high degree of adaptation. In the incompletely separated segments, conditions are found ranging from the normal, with two complete sets of organs in each segment, through forms where the pores of two proglottids are approximated, or the ducts of two sets of organs are united and open through a common pore, to forms in which a proglottid of nearly double the normal length contains only one set of organs on each side, the different conditions being the result of differing degrees of union between the segments. So close is the correspondence between the form of the proglottid and the structure of the contained organs that, in cases where the form-relations are not alike on dorsal and ventral slides, the genital organs of the dorsal side (vas deferens, vagina and testes) correspond in position with the form-relations of the dorsal side, while the organs situated ventrally (ovary, vitellarium and seminal receptacle) conform to the relations on the ventral side.

In general each particular portion of the genital organs tends to occupy as nearly as possible its normal position with respect to the boundaries of the proglottid in its immediate vicinity. Abnormal form of the proglottid thus causes abnormal position and form in the genital organs, this being sometimes so great as to prevent the organs from being functional.

On May 9th, at the third session of the Club, Mr. E. R. Downing read a paper entitled 'The Spermatogenesis of Hydra,' giving the results of his study of this form.

The principal points of Mr. Downing's paper are as follows: The somatic cells divide amitotically usually, probably always. The spermatogonia arise by amitotic division from the interstitial cells and from the ectoderm cells. They divide mitotically to form the spermatocytes of which there is a single generation. These form the spermatids by mitosis. Preceding each mitotic division the nucleus and cell both increase in size, especially the former. After division the daughter cells become correspondingly smaller. The spermatocytes and spermatids contain six chromosomes, the spermatogonia twelve. In the prophase of mitosis the nuclear reticulum becomes more coarsely meshed, and the chromatin gathers into a num-