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-

ber of karyosomes, which later become chromomeres. There are twenty four of these in the spermatocytes and forty-eight in the spermatogonia. The spireme consists of a single linin thread connecting these chromomeres and forming a spiral which winds about the nucleus just beneath the nuclear membrane. At this stage the nucleus is an ellipsoid of revolution. The spireme makes three complete whorls about the spermatocyte nucleus; but six such whorls are formed in the nucleus of the spermatogonium. The centrosome appears at one side of the nucleus in the plane of its minor axis. The nucleus changes next to an oblate spheroid with the centrosome over the pole. The arcs of the spiremes form meridians. There are, therefore, six such meridians in the spermatocytes and twelve in the spermatogonia. Each has four chromomeres. The spireme now divides at the poles into six and twelve segments respectively. These contract, forming spherical chromosomes at the equater. In the chromosomes the individual chromomeres are indistinguishable. Twenty-four karyosomes are to be made out in the late metaphase of the spermatogonic divisions.

The spermatid nucleus assumes the ellipsoid shape. The cytoplasm immediately about it changes so that it will not stain and a small drop of non-staining material forms at one end of the nucleus. This grows in size as the cytoplasm appears to be altered by the nucleus, absorbed by it and stored. This droplet increases until the nuclear wall which covers it, touches and fuses with the cell wall. A slight projection appears at this point of fusion. It rapidly elongates to make the tail. The droplet which forms the middle piece decreases correspondingly. Meantime the cytoplasm and cell wall have completely disappeared. The centrosome appears within the middle piece. From it anteriorly and posteriorly runs the axial fibre. Within the head of the sperm six dumbbell-shaped bodies are apparent, the persistent chromosomes.

The next meeting was held on May 29th and was devoted to two papers. The first of these 'Variation in *Daphnia hyalina*' was read by Miss M. M. Enteman. The following is a brief abstract:

The shell of *D. hyalina* is extremely variable. For the head crest a range of variation is observed covering forms characteristic for many different species of the genus *Daphnia*. The principal forms described for Europe are a low-rounded and a high-rounded crest, and a crest terminating in a more or less acuminate apex. In America, the species, as far as studied, shows the same variations, and, in addition, a triangular and an extremely recurved crest. Further it is to be noted, that while the European varieties resemble other European species in the form of the shell, the American varieties resemble the American representatives of these species. A study of local variation shows widely differing conditions for related regions, some lakes possessing a single stable form, while others furnish all transitions between extreme varieties. Finally, however, different the summer varieties, they are all represented by a uniformly low-crested form in the winter. The species abounds in our clear northern lakes, and these considerations ought to make it a favorable subject for the determination of environmental influences.

The second paper of the session was a review by Mr. R. H. Johnson of the paper 'On the Reactions of *Daphnia magna* Strauss to Certain Changes in its Environment' by E. Warren (*Quart. Journ. Micr. Sci.*, Vol. XLIII., Pt. 2, 1900).

C. M. CHILD.

THE BOTANICAL CLUB OF CANADA.

THE Botanical Club of Canada was organized by a committee of section four of the Royal Society of Canada, at its meeting in Montreal, May 29, 1891. The object is to promote by concerted local efforts and otherwise the exploration of the flora of every portion of British America, to publish complete lists of the same in local papers as the work goes on, to have these lists collected and carefully examined in order to arrive at a correct knowledge of the precise character of our flora and its geographical distribution, and to carry on systematically seasonal observations on botanical phenomena. The intention is to stimulate with the least possible paraphernalia of constitution or rules, increased activity among botan-

ists in each locality, to create a corps of collecting botanists wherever there may be few or none at present, to encourage the formation of field clubs, to publish lists of local floras in the local press, to conduct from year to year exact phenological observations, etc.; for which purposes the secretaries for the provinces may appoint secretaries for counties or districts, who will be expected, in like manner, to transmit the same impetus to as many as possible in their own spheres of action. Members and secretaries, while carrying out plans of operation which they may find to be promising of success in their particular district, will report as frequently as convenient to the officer under whom they may be immediately acting. Before the end of January, at the latest, reports of the work done within the various provinces during the year ended December the 31st, previous, should be made by the secretaries for the provinces to the general secretary, from which the annual report to the Royal Society shall be principally compiled. By the first of January, therefore, the annual reports of county secretaries and members should be sent in to the secretaries for the provinces.

The annual report of the club for the year May 20, 1898, to May 20, 1899, issued as a part of Vol. V., *Trans Roy. Soc. Can.*, second series, 1899–1900, contains a sketch of the history of 'Phenological Observations in Canada.' It also indicates the progress of botanical research, points out the results obtained in Newfoundland, as well as in Labrador, Prince Edward Island and Nova Scotia. This is followed by 'Observations in a Wild Garden,' by Dr. G. U. Hay, of St. John, New Brunswick, besides notes on work done in Ontario. Professor Macoun's researches in the 'Cryptogamic Flora of Ottawa,' published in *The Ottawa Naturalist*, and Mr. James M. Macoun's 'Contributions from the Herbarium of the Geological Survey of Canada' have been published in *The Canadian Record of Science* and in *The Ottawa Naturalist.*

Full descriptions of the new species of Ottawa Violets were given with excellent plates in *The Ottawa Naturalist* of January, 1899, No. 10, Vol. XII., and reference is also made to *Viola Watsoni* Greene, from Prince Edward Island, and another new species from British Columbia, besides notes on the genera *Antennaria* and *Fragaria.*

From Alberta, Assiniboia and British Columbia reports are also sent in. The teachers of the Department of Public Instruction in Nova Scotia, of which Dr. A. H. MacKay is Superintendent, have been most active in recording phenological observations, from which excellent results were gathered.

The officers of the Botanical Club of Canada for the ensuing year are:

President: John Macoun, M.A., F.L.S., Ottawa.

General Secretary-Treasurer: A. H. MacKay, LL.D., Halifax.

Secretaries for the Several Provinces: Newfoundland, Rev. A. C. Waghorne, Bay of Islands.

Prince Edward Island, Principal John McSwain, Charlottetown.

Nova Scotia, Dr. A. H. MacKay (General Secretary-Treasurer), Halifax.

New Brunswick, George U. Hay, M.A., Ph.B., St. John.

Quebec, Professor D. P. Penhallow, B.Sc., McGill University, Montreal.

Ontario, Principal Wm. Scott., B.A., Normal School, Toronto, Toronto.

Manitoba, Rev. W. A. Burman, B.D., Winnipeg.

Assiniboia, Thomas R. Donnelly, Esq., Pheasant Forks.

Alberta, T. C. Willing, Esq., Olds, N. W. T.

Saskatchewan, Rev. C. W. Bryden, Willoughby.

British Columbia (Mainland), J. K. Henry, B.A., High School, Vancouver.

Vancouver Island, A. J. Pineo, B.A., High School, Victoria.

H. M. A.

Ottawa, June, 1900.

DISCUSSION AND CORRESPONDENCE.

HERMAPHRODITISM AMONG THE DOCOGLOSSA.

In a recent number of Science (ix, 914) Dr. Dall gives a brief account of the newly discovered *Bathysciadium conicum*, in the course of which he remarks that should the animal prove to be really hermaphrodite, it will be the first of the Docoglossa to exhibit this character. This statement is one of Dr. Dall's rare slips; hermaphroditism has already been recorded in the case of *Patella vulgata* (Gemmill, *Anat. Anz.*, xii, 392–4, 1896), and of *Acmæa fragilis* (Willcox, *Jen. Zeitschr.*, xxxii, 441 *et seq.*, 1899). Gemmill believes that this condition in *Patella* is excep-