

Pell, in 1673, is clarifying. Leibniz was a politician, not a mathematician, and worked and wrote for the power and prestige of Germany. To this end he founded the Berlin Academy of Science, and was perhaps the first to inaugurate that system of espionage on scientific work in foreign countries by which the usefulness and credit of as much of that work as possible might be transferred to Germany.

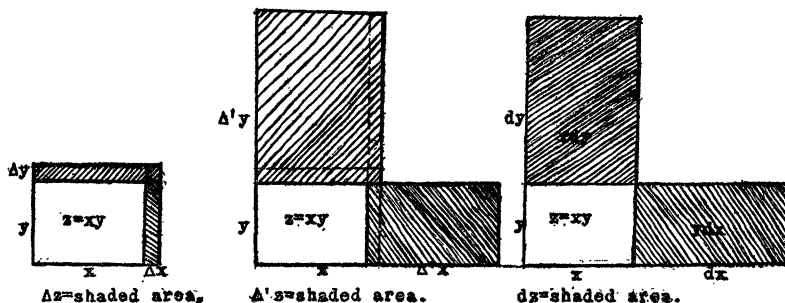
It may be urged that calculus has been benefited by the interference of Leibniz. This is true as to notation, but it has been harmful as to the theory and understanding of the subject. On the one hand we have an illogical infinitesimal method, on the other an incomplete derivative one in protest of the first, whose rival expounders reason along different lines, and hardly understand each other. Newton substitutes one rigorous theory, broader than either of these, neglecting no

Starting from given corresponding values,  $x$ ,  $y$ ,  $z$ , the actual variables are corresponding increments to these with a common *first* value, 0; and starting with any corresponding increments,  $\Delta x$ ,  $\Delta y$ ,  $\Delta z$ , we form an *ideal* variation in the same ratio,  $\Delta'x = N\Delta x$ ,  $\Delta'y = N\Delta y$ ,  $\Delta'z = N\Delta z$ , where the common multiplier  $N$ , varies. This is the familiar law of uniform variation between two sets of values of the variables, and the symbols  $\Delta'x$ , etc., are not limited to small values but vary from 0 to  $\infty$ , as  $N$  so varies, however small  $\Delta x$ , etc., may be.

Such  $\Delta'x$ ,  $\Delta'y$ ,  $\Delta'z$  are approximate fluxions; and the exact fluxions  $dx$ ,  $dy$ ,  $dz$ , are limits of these for  $\lim. \Delta x = 0$ ,  $\lim. \Delta y = 0$ ,  $\lim. \Delta z = 0$ . For example, let  $z = xy$ , then  $\Delta z = y\Delta x + (x + \Delta x)\Delta y$ , and multiply both members by  $N$ .

$$\Delta'z = y\Delta'x + (x + \Delta x)\Delta'y,$$

whence by limits,  $dz = ydx + xdy$ .



We may illustrate the three variations geometrically:

- (1) Actual. (2) In the Same Ratio. (3) In the First Ratio.

quantity, however small, leaving no unexplained symbol, and yet of an arithmetical character of the utmost simplicity. A free translation of his definition in "Quadrature of Curves," is as follows:

In their highest possible *approximation*, fluxions are quantities in the same ratio as the *smallest possible* corresponding increments of variables, or, in a form of exact statement, they are in the *first* ratio of nascent increments.

Thus fluxions, or differentials, are interpreted as ordinary arithmetical increments, but in a variation defined as *in the first ratio*, or, as *the variables begin to increase*, or, in *the instantaneous state*, which are all one.

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### SCIENTIFIC BOOKS

#### REPORT OF THE CANADIAN ARCTIC EXPEDITION, 1913-18

SHORTLY after the return of the Southern Party of the Canadian Arctic Expedition with their collections in the fall of 1916, steps were taken to arrange for the publication of the scientific results of the expedition. Although the general direction of the operations of the expedition had been under the Department of the Naval Service, most of the scientific men on the expedition were under the Geological Survey, of the Department of Mines, the col-

lections were destined for the Victoria Memorial Museum, of Ottawa, and interdepartmental cooperation was desirable in publishing the results. An Arctic Biological Committee was appointed jointly by the two services, to select specialists to report on the various groups of specimens represented in the collections of the expedition, to distribute the specimens, and arrange for the final publication of the reports. This committee consisted of: Chairman, Professor E. E. Prince, commissioner of Dominion Fisheries; secretary, Mr. James M. Macoun, C.M.G., botanist and chief of the biological division of the Geological Survey; Professor A. B. Macallum, chairman of the Commission for Scientific and Industrial Research; Dr. C. Gordon Hewitt, Dominion Entomologist, of the Department of Agriculture, and Dr. R. M. Anderson, zoologist of the Geological Survey and lately chief of the Southern Party of the expedition, representing the expedition. Each member of the committee was made responsible for the editing of reports in his own section, and Dr. R. M. Anderson was appointed general editor of the reports. This committee has been at work for nearly three years, but owing to the difficulty of securing the services of the fifty or more competent specialists needed to work up the reports, on account of the exigencies of war and other reasons, the first of the technical reports was not issued from the press until July 10, 1919.

These biological reports, and to a large extent the geological and ethnological reports which it is hoped will follow them, were mainly the results of the work of the scientists of the Southern Party of the expedition, owing to the unfortunate death or elimination from work of most of the scientific staff of the Northern Party of the expedition and the total loss of their collections with the *Karluk* in 1914. As a result the later activities of the remainder of that party were practically all geographical and other work and collections merely incidental. The small amount of fragmentary material which was brought back in 1918 has in most cases been included in the reports issued, but in some cases a separate paper will be issued.

The plan adopted by the committee is to issue the report on each group or subject as a separate paper, of the regular octavo size which has been found to be the most convenient and popular for modern scientific papers. Most of the papers are illustrated by line drawings or half-tone engravings from photographs, and in some cases by heliotype or colored plates, illustrating many new species and a few new genera. These papers are mostly too technical to be of interest to the general reader, and the separates are intended to be distributed at time of issue to specialists interested in the particular branch covered, and 1,000 copies of each paper are to be kept by the government and bound into volumes for distribution to public libraries, universities, colleges and other scientific institutions. Eight volumes have been arranged for the biological series, including reports on mammalogy, ornithology, ichthyology and invertebrate marine biology, entomology and botany, and the parts as issued are numbered as parts of these volumes. They are not issued in consecutive order, but each part is printed as it is ready, in order to avoid delay in making the knowledge available to the scientific world and to the public. The amount of specimens and data available and the character and scientific reputation of the specialists engaged in the work promise to make this the most extensive and comprehensive publication on Canadian and western Arctic biology since Richardson and Swainson's "Fauna Boreali-Americana" (1829-31) and Hooker's "Flora Boreali-Americana" (1840).

The volumes in preparation are as follows:

Volume I: General Introduction and Narrative.

A. Northern Party.

B. Southern Party.

Volume II: A. Mammals. B. Birds.

Volume III: Insects. (10 parts.)

Volume IV: Botany. (Cryptogams) (5 parts.)

Volume V: Botany. (Phanerogams.)

Volume VI: Fishes, Tunicates, etc. (2 parts.)

Volume VII: Crustacea. (12 parts.)

Volume VIII: Mollusks, Echinoderms, Coelenterates, etc. (9 parts.)

Volume IX: Annelids, Parasitic Worms, Protozoans, etc. (12 parts.)

Volume X: Plankton, Hydrography, Tides, etc.

Eleven of the separate parts of the different volumes have been issued:

*Volume III.—Insects:*

Part A—Collembola, by Justus W. Folsom. July 10, 1919.

Part B—Neuropteroid Insects, by Nathan Banks. July 11, 1919.

Part C—Diptera. July 14, 1919.

Crane-flies, by Charles P. Alexander.

Mosquitoes, by Harrison G. Dyar.

Diptera (excluding Tipulidae and Culicidae), by J. R. Malloch.

Part D—Mallophaga and Anoplura. September 12, 1919.

Mallophaga, by A. W. Baker.

Anoplura, by G. F. Ferris and G. H. F. Nuttall.

Part E—Coleoptera. December 12, 1919.

Forest Insects, including Ipidae, Cerambycidae, and Buprestidae, by J. M. Swaine.

Carabidae and Silphidae, by H. C. Fall.

Coccinellidae, Elateridae, Clerysomelidae and Rhynchophora, by C. W. Leng.

Dystiscidae, by J. D. Sherman, Jr.

Part F—Hemiptera, by E. P. Van Duzee. July 11, 1919.

Sawflies, by Alex. D. MacGillivray.

Parasitic Hymenoptera, by Charles T. Brues.

Wasps and Bees, by F. W. L. Sladen.

Plant Galls, by E. Porter Felt.

Part G—Hymenoptera and Plant Galls, November 3, 1919.

Sawflies, by Alex. D. MacGillivray.

Parasitic Hymenoptera, by Chas. T. Brues.

Wasps and Bees, by F. W. Sladen.

Plant Galls, by E. P. Felt.

Part H—Spiders, Mites and Myriapods. July 14, 1919.

Spiders, by J. H. Emerton.

Acarina, by Nathan Banks.

Chilopoda, by Ralph V. Chamberlin.

*Volume VII.—Crustacea.*

Part A—Decapod Crustaceans, by Miss Mary J. Rathbun. August 18, 1919.

Part B—Schizopod Crustaceans, by Waldo L. Schmitt. September 22, 1919.

*Volume VIII.—Mollusks, Echinoderms, Coelenterates, etc.*

Part A—Mollusks, Recent and Pleistocene, by Wm. Healey Dall. September 24, 1919.

*Volume IX.—Annelids, Parasitic Worms, Protozoans, etc.*

Part A—Oligochaeta, by Frank Smith and Paul S. Welch. September 29, 1919.

## THE AMERICAN SOCIETY OF NATURALISTS

THE thirty-seventh annual meeting of the American Society of Naturalists was held in Guyot Hall, Princeton University, on December 30 and 31, 1919.

The report of the treasurer showing a balance on hand of \$327.33 was accepted.

The following changes in the constitution, recommended by the executive committee, were authorized.

Article III., Section 1, to read: The officers of the society shall be a president, a vice-president, a secretary and a treasurer. These, together with three past-presidents and the retiring vice-president, shall constitute the executive committee of the society.

Article III., Section 2, to read: The president and vice-president shall be elected for a term of one year, the secretary and treasurer for a term of three years. Each president on retirement shall serve on the executive committee for three years. Each vice-president on retirement shall serve on the executive committee for one year. The election of officers shall take place at the annual meeting of the society, and their official term shall commence at the close of the meeting at which they are elected.

On recommendation of the executive committee the society accepted an invitation from the National Research Council to appoint an advisory committee to act with the Division of Biology and Agriculture. The following were elected to this committee: Herbert S. Jennings, Alfred G. Mayor, George H. Shull, Ross G. Harrison, Bradley M. Davis.

A request for financial support from the management of Botanical Abstracts was discussed by the society with the result that a motion was carried to the effect that such appropriations were against the general policy of the American Society of Naturalists.

On motion the society approved of the appointment by the chair of a committee to consider and report on genetic form and nomenclature. This committee consists of Clarence C. Little, Donald F. Jones, Sewall Wright, Alfred H. Sturtevant and George H. Shull.

The following resolution presented by Charles B. Davenport and strongly supported from the floor was adopted.

WHEREAS, A current index of scientific publications is necessary to the progress of science and