removal of solutions or gases in a closed system, as described in a recent issue of SCIENCE.[1] The device was incorporated in a simple gasometric pipette for the analysis of respiratory gases which has been in use in our laboratory for the past two years and has proved highly satisfactory. This adaptation of a serum bottle stopper was first suggested to me by Lieutenant Colonel F. G. Hall, while working at the Aero-Medical Laboratory at Wright Field. The pipette assembly was described in the *Journal of the Elisha Mitchell Scientific Society*.[2]

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SOCIETIES AND MEETINGS

ANNUAL MEETING OF THE ROYAL SOCIETY OF CANADA

THE meeting of the Royal Society of Canada for 1945 was held at Queen's University, Kingston, from May 20 to May 23, under the chairmanship of the president, J. K. Robertson, professor of physics at Queen's University. In the scientific sections, one hundred and four fellows and half as many guests were in attendance.

New fellows were presented at the first general meeting, including the following in the scientific sections:

Section III (Chemical, Mathematical and Physical Sciences): R. Brauer, E. W. Hewson, O. J. Walker.

Section IV (Geological Sciences): V. J. Okulitch, J. E. Thomson, H. V. Warren.

Section V (Biological Sciences): E. W. Crampton, J. Labarre, W. Leach, C. A. Mitchell, A. W. H. Needler, D. Y. Solandt.

Besides sectional and business meetings, there were two largely attended evening meetings. On the evening of May 21, the society's medals were presented. Professor R. B. Thomson, of the University of Toronto, received the Flavelle Medal as a tribute to his work on the comparative anatomy and physiology of plants. The Henry Marshal Tory Medal was presented to Professor Otto Maass, of McGill University, who was hailed as a man possessed of experimental skill and scientific imagination, with a fondness for hazardous experiment. Professor Maass is assistant to the president of the National Research Council, director of chemical warfare and smoke for the Department of National Defence, and has played a leading rôle in planning chemical research in Canada since the outbreak of the war. The Willet G. Miller Medal was given to Dr. M. E. Wilson, who, conspicuous among Precambrian geologists of the world, has done much in Canada in guiding, prospecting and encouraging mining. The Lorne Pierce Medal was awarded to L'Abbé Felix Antoine Savard, of Laval University, and the Tyrell Medal to Professor F. Landon, of the University of Western Ontario.

After the presentation of medals, Professor J. K. Robertson delivered his presidential address on the subject, "Continuity and Discontinuity." The paper was divided into two parts, a discussion of the progress of philosophical opinion down to the eighteenth century, followed by an assessment of the emergence of the two conceptions and their development by physicists up to the present day. Recognizing that "present-day physics continues to demonstrate the interplay of continuity and discontinuity," he concludes that "the modern physicist no longer accepts a materialistic philosophy and no longer assumes that, as time goes on, he will learn more and more about the ultimate details of a real objective world. His advances have shown him that measurements and observations can not give him exact knowledge beyond a certain stage, and hence, for him, what is beyond has no meaning. His aim now is the more modest one of describing facts and observations in terms of correlating laws, which in the last analysis can be expressed accurately only by mathematical symbols."

On the evening of May 22, following a complimentary dinner given by the mayor and City Council of Kingston, a popular lecture, "Biological Control of Insect and Plant Pests," was given by Dr. W. R. Thompson, F.R.S., Imperial Parasite Service, Belleville, Ontario. This paper so impressed the fellows that a resolution was passed at a general meeting next day, expressing to the Imperial Institute of Entomology its appreciation of the work done in Canada during the war, and asking that arrangements be made for its continuation.

In Section I, twenty-one papers were presented on subjects of historical or literary interest in French Canada.

In Section II, the presidential address by Professor W. H. Alexander was a provocative discussion of some obvious incompatibilities of temperament as between the ideals of a genuine education and the spirit of the ultrademocratic state as suggested by Plato's Apology to Socrates. Papers were read in the fields of literature, philosophy, history and the social sciences. Anthropology and archeology were represented by papers on "The Distribution of Rubbed Slate Instruments in Eastern Canada" by Dr. Douglas Leechman, and by the myth of "Bear Mother" by Dr.

[1] F. B. Senn, SCIENCE, 101: 392, 1945.

[2] 59: 201–204, 1943.

Marius Barbeau. A timely paper was presented by Professor R. Flenley, "The Results of the Reformation in Germany."

In Section III (chemical, mathematical and physical sciences) the most important feature of the meeting was a symposium on "The Dimensions of the Galaxy." This subject was first treated very ably by Dr. Helen Sawyer Hogg from the standpoint of the observations on globular clusters. Dr. C. S. Beals dealt with the obscuring matter between the stars and its influence on estimates of galactic dimensions. These papers led up to the presidential address by Dr. J. A. Pearce, of the Dominion Astrophysical Observatory, entitled "The Dimensions of the Galaxy as Derived from Studies of Galactic Rotation," in which he reviewed the history of the subject from the time of Herschel to the most recent estimates.

Thirty-five other papers were presented to the section, ten by title. A notable series of ten chemical papers was presented by Professor Paul E. Gagnon, of Laval University, Quebec, ranging from the synthesis of amino acids to the technology of charcoal, and exhibiting the great activity in chemistry at that institution. Professor William Ure, of the University of British Columbia, described the mechanism of the "flotation process" of concentrating ores, showing the necessity of a water-repellent layer on the surface of the mineral. Professor J. K. Robertson, Queen's University, described the effect of high-frequency discharges in producing patterns in thin layers of metal placed in the discharge tube. Five meteorological papers were read by members of the staff of the Meteorological Service of Canada, including a new theory of the mechanism of the "Chinook" wind (the warm dry wind which frequently descends the eastern slope of the Rocky Mountains in Alberta) by D. H. Smith and C. E. Thompson.

Nineteen papers were presented to Section IV. In the presidential address, Dr. J. S. DeLury gave an outline of a hypothesis to explain crustal movements. In his opinion, the earth's crust is strong to a depth of 450 miles or more. Liquid rock, known as magma and as lava when it reaches the surface, is formed in shallow levels by frictional heat generated in crustal movements, and is not inherited from a primitive molten earth. These movements are due to failure in the crust caused by thermal contraction followed by a very protracted process of collapse.

Dr. A. W. Jolliffe presented evidence that geologically the northwestern part of the Canadian Shield may be divided into four subprovinces. From north to south these are: (1) Great Bear—characterized by Proterozoic formations, north-east faulting with right-hand displacements, and U-Ag-Co-Ni-Cu mineralization; (2) Yellowknife—characterized by Archaean formations, north to north-west faulting with left-hand displacements, and Au-mineralizations; (3) East Arm—characterized by chiefly Proterozoic formations, north-east faulting, and Cu-Co-Ni-Au mineralization; and (4) Taltson—by both Proterozoic and Archaean formations, north to north-west faulting, and Ag-Pb-Au mineralization.

Dr. T. L. Tanton offered a theory, based on a study of conchilites and the work of W. D. Francis, indicating the steps whereby non-living matter evolved into semi-living organisms that provided the catalyzer for the synthesis of protein and the conditions that induced the evolution of primeval forms of life.

Dr. M. L. Keith described brucite deposits in the Rutherglen District, Ontario. Franco Rasetti reported the discovery of Middle Cambrian fossils in the Gaspé, the first recorded in the Province of Quebec. Dr. R. F. Legget described the geology of the "Shipshaw" area on the Saguenay River, and reported finding wood and other organic matter imbedded in the clay. Peter Ginn described an ultrabasic rock near Lochalsh, Ontario.

Dr. Robert Newton, president of Section V, in discussing "The Northern Limits of Wheat Production," pointed out that wheat production in Canada is mainly confined to the southern plains region of the Prairie Provinces. Its possible northward extension concerns not only the potential world food supply, but also the feasibility of northern settlement. The longer summer days of northern latitudes are favorable to growth, but their value is reduced by association with lower temperatures. Rainfall is another important modifying factor. Moreover, the milling and baking quality of northern wheat is generally inferior. This may not destroy its usefulness as a local food resource, but makes it unsuitable as an article of commerce.

Professor R. B. Thomson, the Flavelle Medal winner, presented an invitation paper entitled, "Food Supply and Budding or Twinning Embryogeny." Professor Thomson believes that the view that the asexual type of embryo initiation involved in budding or twinning embryogeny is due to recent mutation, is not supported by sufficient evidence, whereas that for its being an innate or constitutional potentiality is satisfactory. The expression of this potentiality, however, is generally kept under control as indicated by the prevalence of simple embryogeny (one embryo from one zygote) in the main lines of evolutionary advance. Thus the problem of accounting for the sporadic occurrence of budding or twinning at different levels in such advance is concerned with the elimination of established control.

This has been effected in animals by various physical and chemical experimental procedures. Up to the

present, however, little attention has been given to the influence of food supply, and some experimental and other evidence, particularly the effect of excess nutrition on the production of a free nuclear stage in embryos normally undergoing simple embryogeny, indicates the importance of giving more attention to the possibly broader significance of this factor.

Dr. W. H. Cook, director of the Division of Applied Biology of the National Research Council, discussed some of the war research projects of the council under the title "Some Wartime Food and Supply Problems." Under war conditions the main problem in feeding civilian or service personnel is that of transport and distribution, complicated by the perishability of many foodstuffs. To meet the emergency, facilities had to be improvised to preserve the product, or alternatively the foodstuffs themselves had to be rendered less perishable. The dehydration of foodstuffs rich in proteins and fats was discussed in relation to the measurement and maintenance of quality and the type of deterioration that occurs.

Several new chemicals required by war industry can be provided by the fermentation of starch. Reference was made to the bacterial fermentation yielding 2,3-butanediol, a material readily converted to butadiene and other chemicals.

Thirty-eight other papers on various phases of biological and medical sciences made up the program of Section V. These included an important communication by Dr. B. P. Babkin, describing the interference of quinine bisulphate with cholinergic mechanisms in the heart and stomach of the dog, and a demonstration by Dr. C. C. Macklin that venule capacity in the lung is increased on inspiration.

Officers for 1945–46 were elected as follows: *President,* Professor E. S. Moore, University of Toronto; *Vice-president,* Professor H. A. Innis, University of Toronto; *President, Section I,* Dr. S. Marion, Ottawa; *President, Section II,* Professor D. C. Harvey, Dalhousie University, Halifax; *President, Section III,* Professor C. T. Sullivan, McGill University; *President, Section IV,* Dr. B. R. McKay, Ottawa; *President, Section V,* Dr. B. P. Babkin, McGill University.

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SCIENTIFIC BOOKS

CLIMATE AND HUMAN HEALTH

Climate and the Energy of Nations. By S. F. MARKHAM. x + 236 pp. Illustrated. Oxford University Press. 1944. $3.50.

THE relation of climate to the incidence of infection has attracted interest for a long time, but only recently has the effect of climate on individual fitness received much scientific study. This has resulted to a large extent from the difficulties experienced in maintaining full efficiency in troops exposed to extreme climatic conditions. Consequently, laboratories have been set up for the wartime study of such problems in Germany, Russia, Canada, England and on a particularly large and elaborate scale in this country. A large number of trained personnel exist, and it would be a misfortune if their experience ceases to be utilized for the public good after the war.

The main object of this note is to draw attention to a recent work by S. F. Markham (an English Member of Parliament) entitled "Climate and the Energy of Nations" (Oxford Press, 1944). This book traces the spread of civilization in relation to climate, reviewing history with emphasis on the effects of developments in housing, heating of houses, chimneys, glazed windows, central heating and adequate lighting on the spread of culture to more northern climates, where cold and the long winter nights would otherwise have hindered development. The ideas advanced stem from those of Professor Ellsworth Huntington and are presented in a popular manner. While the author's technical knowledge is open to criticism, so that an abstractor for *Biological Abstracts* reviewed the book with little sympathy, the author sees the problems clearly in broad outlines and presents a point of view, which is of considerable public interest. He maintains that men developing under good conditions will outstrip those living under greater handicaps, and that such environmental factors are more important than minor genetic differences between racial strains. Considering how great are the obstacles to book work imposed by long periods of cold and darkness, biologists are apt to agree with him. If the thermal regulation of houses were limited to heating as it has been in the past, one would expect the main centers of civilization to shift more and more to colder climates. If we were able to understand fully the factors concerned, better conditions should be obtained in regulated houses than are found in any natural climate. Mr. Markham presents evidence that high levels of intelligence are more prevalent in areas where extreme climatic conditions are rare. He argues that such intelligence levels are demonstrated in high standards of public health, of foreign trade and national wealth. The relationship of such factors to external climate, if established, are