

ROYAL SOCIETY OF CANADA

ANNUAL MEETING

THE Royal Society of Canada held its annual meeting at the University of Toronto during May 19-22 under the presidency of Dr. E. S. Moore, head of the Department of Geology in that University. The following new fellows were elected in the scientific sections: Section III (Chemical, Mathematical and Physical Sciences): Dr. Helen S. Hogg, of the David Dunlap Observatory; Dr. L. H. Howlett, of the National Research Council; Dr. C. A. Winkler, of McGill University. Section IV (Geological Sciences): Dr. R. H. Derry, of Ventures Ltd., Toronto; Dr. H. C. Horwood, of the Ontario Department of Mines; and Dr. H. M. A. Rice, of the Geological Survey of Canada. Section V (Biological Sciences): Dr. Louis Berger, of Laval University; Dr. I. McT. Cowan, of the University of British Columbia; Dr. James Craigie, of the Toronto School of Hygiene; Dr. R. K. Larmour, of the University of Saskatchewan; Dr. A. E. Porsild, of the National Museum; and Dr. R. F. Shaner, of the University of Alberta.

The Flavelle Medal was awarded to Prof. William Rowan, of the University of Alberta, for his pioneer experiments on bird migration, in which he has shown that crows will fly north instead of south in sub-zero November temperatures of Alberta after being exposed to spring-like conditions of progressively longer days artificially produced.

The Henry Marshall Tory Medal was awarded to Dr. J. S. Foster, of McGill University, for his work on radar.

Dr. Moore delivered his presidential address on the evening of May 20, his subject being "Our Earth". He dealt particularly with the relation of life to the earth, stating that rocks laid down long before the stage that first left evident remains of organisms have no proper explanation than that living things must have been present to produce them. Grenville crystalline limestone is one of these layers and indicates that life of some kind must have existed 1,800,000,000 years ago. Man's effect on the earth looms large in his own estimation, but his time—a million years—is but a 'flash in the pan' to what preceded him. That he may destroy the earth with atomic energy is feared by some, but seemingly geologists as well as physicists consider this most improbable. Uranium, the key material for release of the energy, is more abundant in the crust of the earth than inside, yet only one pound of it is produced annually to every 200 pounds of the gold that is thought to be very rare. Fissionable material (uranium and thorium) is too scarce and too scattered through the mass of inert material for any explosion to have more than a local effect.

Prof. J. D. Cockcroft, of the University of Cambridge, director of the Canadian Experimental Atomic Energy Plant, and recently appointed director of the British Atomic Energy Research and Development Station at Harwell, Berks, gave the popular lecture, which was on "Atomic Energy" and dealt largely with the slow reactions which occur in atomic piles. The National Institute for Nuclear Research is being built up at Chalk River by the Canadian Government around a pile which uses many tons of heavy water and uranium. Laboratories for nuclear physics, technical physics, radio-chemistry and medical

research have been established. A high-power pile will shortly be in operation, which will be the most powerful research apparatus of this kind in the world. This should make possible many new types of physical experiments, as well as the production on a large scale of labelled or radioactive atoms for biological, medical and chemical research, of substitutes for radium such as radio-cobalt, and of plutonium for study of power generation.

In Section III the retiring president, Prof. C. T. Sullivan, of McGill University, delivered an address on "Some Investigations in the Projective Differential Theory of Scrolls". Prof. J. D. Cockcroft gave an invited paper on the atomic pile as a research tool, and Prof. J. S. Foster described the cyclotron now under construction at McGill University.

Among many interesting papers may be mentioned a group from the Canadian nuclear research laboratories at Chalk River, Ontario, mainly devoted to new instruments and techniques, and a group from the Dominion Astrophysical Observatory near Victoria, B.C. A spectrograph was described by M. F. Crawford and his collaborators of the University of Toronto. It was stated that this may replace the ordinary spectrograph for most Raman spectroscopy. D. C. Rose and J. S. Marshall, of the Canadian Army Research Establishment, demonstrated an apparatus, developed during the War, for the precise measurement of the velocities of projectiles, and showed how the apparatus, after slight modification, could be used to measure the speed of sound.

In the presidential address of Section IV, Dr. B. R. MacKay described the stratigraphy and structure of an area 100 miles long and 35 miles wide in the Rocky Mountain foothills belt of Central Alberta. A succession of sediments ranging in age from Devonian to Tertiary with a thickness of 26,000 ft. have been subjected to thrust faulting, folding and later thrust faulting. The area embraces an important group of bituminous coalfields, one of which is at an altitude of more than 6,000 ft.

Dr. W. E. Cockfield and A. F. Buckham described a phenomenon resembling sink-holes in the white silt deposits of Kamloops, B.C., and gave evidence to show that they developed by removal of materials in suspension, and not by solution in circulating underground waters. Dr. T. L. Tanton, in describing the relations between the hard and soft iron ore at Steeprock Lake, Ontario, interpreted the hematite deposits not as a surficial weathering product but as a late phase of a succession of mineral deposits introduced by hot solutions from depth at this locality. Dr. H. V. Warren and C. H. Howatson gave the results of a series of investigations carried on in British Columbia, in which it was noted that the zinc and copper content of some plants reflect, in some areas to a startling extent, the zinc and copper content of the underlying soils and rocks. Dr. J. E. Thomson presented the results of detailed mapping in the Kirkland Lake gold-bearing area, and explained the phenomena supporting his interpretation of a great angular and erosional unconformity between the Keewatin volcanics and the Timiskaming sedimentary-volcanic complex of that area. Dr. W. W. Moorhouse dealt with norites and related rocks at Eagle Lake, Ontario. The norite has been locally altered by younger granites and solutions derived from them; in the deuteric or late stage there was a development of concentrations of titaniferous magnetite, apatite and other accessory minerals. Nodular and lenticular masses of titaniferous magnetite are

believed to have segregated in immiscible liquid fractions.

The presidential address of Section V was given by Dr. B. P. Babkin, of McGill University, on "Antagonistic and Synergistic Phenomena in the Autonomic Nervous System". Most internal organs have a double nerve supply of which one is excitatory (sympathetic) and the other inhibitory (parasympathetic), that is, they work against each other. For the digestive glands, however, the parasympathetic works with the sympathetic, both giving stimulation. There are no true inhibitory nerves, and secretion is inhibited only through reducing the blood supply by vasoconstriction.

Dr. W. Rowan presented an invited review of investigations upon the factors influencing migration of birds, and outlined a new theory of the origin of speech. An important group of papers upon physiological characteristics of fishes which influence their distribution and their behaviour was presented by C. W. Andrews, E. C. and V. S. Black, J. S. Hart, and F. E. J. Fry, the last bringing forward notable general considerations regarding controlling and limiting factors in environment. Two papers by Kenneth Graham discussed certain fundamental aspects of the physiology of codling moth larvæ and described a new disease of black-headed budworms.

In the field of botany, five new species and two suggested new genera were reported among seed-borne fungi, and conifer-borne species of *Tympanis* were described. Dr. A. H. Hutchinson presented three papers giving original methods that are being applied to ecological studies in British Columbia forests. A study by Herbert Stern of pollen cells and pollen mother-cells at the time of division discovered an extraordinary increase in permeability. An investigation by Dr. William Leach of oxygen and nitrogen respiration provided interesting indications of oxidative anabolism in a number of germinating seeds, in various tissues with different food reserves, and in *Aspergillus* growing on media with different sugars.

Dr. Madge T. Macklin and Dr. Louise Hopkins reported a statistical study in children of two kinds of congenital nerve deafness which are hereditary and both dependent upon recessive genes. However, it appears that there is occasional departure from the rule that all children of parents who are both affected with the same recessive defect are affected. Dr. R. G. Sinclair discussed the reactions of mustard gas with cephalins such as phosphatidyl serine and phosphatidyl ethanolamine. The resultant compounds cannot be dispersed in water and their base-binding capacities are considerably lower than those of the corresponding lipids. Drs. S. D. Simpson, S. H. Zbarsky and L. Young reviewed briefly their investigations of the toxicity and antidotal activity of British Anti-Lewisite (BAL), 2,3-dimercapto propanol, and of related thiols. These studies were greatly facilitated by the use of radioactive sulphur (S^{35}) which was incorporated in the compounds under investigation.

The officers of the Royal Society of Canada elected for 1946-47 were as follows: *President*, Dr. H. A. Innis, professor of political science in the University of Toronto; *Vice-President*, Dr. W. P. Thompson, professor of biology in the University of Saskatchewan; *President, Section I*, Pierre Daviault, Ottawa; *President, Section II*, Dr. Alexander Brady, associate professor of political science in the University of

Toronto; *President, Section III*, Dr. E. L. Harrington, professor of physics in the University of Saskatchewan; *President, Section IV*, Dr. Bruce Rose, of the Department of Geology, Queen's University, Ontario; *President, Section V*, Prof. J. R. Dymond, professor of systematic zoology in the University of Toronto.

NATIONAL RESEARCH COUNCIL OF CANADA

A MEDICAL RESEARCH DIVISION

A DIVISION of Medical Research has been established by the National Research Council of Canada to carry on work previously directed through the Associate Committee on Medical Research. Dr. J. B. Collip, director of the Research Institute of Endocrinology, McGill University, Montreal, chairman of the former Associate Committee, has been appointed director of the Division, and Dr. G. H. Etinger, professor of physiology, Queen's University, Kingston, assistant director. A new Committee on Medical Research will advise on questions of policy and with respect to medical problems which should be investigated. Under the new organisation of this work, the National Research Council will continue to support medical research mainly in the existing medical schools and hospitals throughout Canada, rather than through the establishment of medical research laboratories and appointment of medical research workers under its own auspices. The general subject of medical research was sponsored by the National Research Council just before the War at the request of the Canadian Medical Association and the Royal College of Physicians and Surgeons. On the outbreak of war, the Associate Committee on Medical Research offered its services through the National Research Council to the Dominion Government for the co-ordination of war-time medical research.

Most of the war problems investigated by the Associate Committee on Medical Research were supervised by four subcommittees, all with members from the Services. The Subcommittee on Shock and Blood Substitutes (chairman, Dr. C. H. Best) directed researches through regional groups in Toronto and Montreal on the fundamental nature of shock, on the use of isinglass as a blood substitute, on the preparation, properties, storage and transportation of dried human blood serum, and on methods of preservation of whole blood and red blood cells. It acted as adviser to the Connaught Laboratories, the Canadian Red Cross Society, and the Department of Pensions and National Health, in the matter of preparation of dried serum, and to the Royal Canadian Army Medical Corps in the preparation of a film demonstrating the recognition and treatment of shock. It issued memoranda on the "Early Recognition and Treatment of Shock" and on the "Organization and Operation of a Blood Bank".

The Subcommittee on Infections (chairman, Dr. Duncan Graham) organised researches on the diagnosis and treatment of wounds infected with gas gangrene and other organisms, and pioneer experiments on the local application of sulphonamides. It supervised the production of typhus vaccine and Shiga toxoid, and made suitable recommendations to the Department of National Defence concerning their use. It instituted experiments on methods of