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THE OTTAWA MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Edited by Dr. F. R. MOULTON

PERMANENT SECRETARY

OTTAWA WAS HOST

As was anticipated, the arrangements for the meeting at Ottawa from June 27 to July 2, inclusive, were excellent. Efficient local committees provided for every requirement from finances and meeting places to boy scouts to serve as messengers. There was a fine combination of attention to business details, preparation for scientific sessions, provision for social diversions and a warm spirit of hospitality to visitors. Moreover, the weather was perfect. Ottawa, the capital city of Canada, was indeed host to the association, and those who attended the meeting will long remember it as a delightful occasion.

That the association is American in the broad sense of the word could not be better illustrated than it was at Ottawa. The meeting was not international; it was simply American. The science was not Canadian or United Statesian; it was just science, even though the subject was some geological or biological problem of one or the other of the countries. There was no fine balancing of chairmanships and positions on committees as there is in meetings colored by political considerations. Science was the order of business, and it was conducted in the spirit of perfect harmony and good fellowship.

And why shouldn't a meeting of the association be

wholly free from all considerations of national boundaries? Science is not sectional nor limited to any people. Throughout its history its heroes have appeared in every civilized land, and they have spoken every tongue. The mere fact that I feel it is appropriate to mention these things is a commentary on the low level at which the relations among peoples now largely exist. In the world as a whole the rule of tooth and claw prevails. Perhaps science will be able to initiate an age of reason; certainly the Ottawa meeting tended in that direction.

In order to promote interest in science as widely as possible throughout America, the association holds its meetings in various cities in the United States and Canada. For example, the summer meeting two years ago was held in Rochester, N. Y., and the meeting last summer was held in Denver, Colo. It is hoped that the meeting in Ottawa will add a great impetus to science in Ontario, and indeed throughout Canada. Canadian science has had a distinguished history, as was excellently demonstrated in the symposium on "History of Science in Canada," which was organized and presented by the Section on the Historical and Philological Sciences. Perhaps the Ottawa meeting will mark the close of one period in Canadian science and the beginning of a new one. By a happy coincidence, the council, by unanimous action, voted to admit the British Columbia Academy of Sciences to the relationship of an affiliated society of the association. There are now 31 affiliated academies of science, only one of which is Canadian.

SOME STATISTICAL INFORMATION

From its organization in 1848 until 1902 the association held its meetings, one each year, in the summer, usually in August. Beginning with 1902, the time of the meetings was changed from the summer to the last week in December, including occasionally the first days of January. These winter meetings are the annual meetings of the association. In August, 1915, a summer meeting was held in San Francisco, Calif., in connection with the organization of the Pacific Division. In June, 1922, a summer meeting was held in Salt Lake City, Utah, and in September, 1923, one was held in Los Angeles near the time of a total eclipse of the sun, which was visible from southern California and northern Mexico. In June, 1925, two summer meetings were held, one in Boulder, Colo., in connection with the Southwestern Division, which was organized in 1920, and one in Portland, Oregon, in connection with the Pacific Division. Since 1931 the association has regularly held summer meetings.

In comparing statistics of meetings of the association, it should be remembered that in earlier years only one meeting was held each year, whereas there are now two. The annual December meeting has been by far the larger of the two, with the exception of the Chicago meeting in June, 1933, in connection with the Century of Progress Exposition.

Canada has been host to the association in five meetings: Montreal, 1857 and 1882; Toronto, 1889 and 1921; and Ottawa, 1938. The first four were regular annual meetings of the association; the last, a summer meeting. Some of the principal statistics relating to the five meetings held in Canada are:

	1857	*1882*	*1889*	*1921*	*1938*
Members	953	1,407	1,956	11,547	19,307
Registrations	351	937	424	1,832	1,104
Papers	132	255	211	900	466

As has been stated, the statistics for the Ottawa meeting are not comparable with those of earlier years. Perhaps a better comparison would be obtained by combining the figures for the Indianapolis and the Ottawa meetings. For the two meetings together, the number of registrations was 4,198 and the number of papers (including 25 invited discussions) was 2,147.

The registrations at Ottawa were as follows: Alberta, 16; British Columbia, 10; Manitoba, 10; New Brunswick, 17; Nova Scotia, 16; Ontario, 543 (Ottawa, 373); Quebec, 125; Saskatchewan, 16; Prince Edward Island, 2 (total for Canada, 755); Newfoundland, 2; Alabama, 2; California, 5; Connecticut, 14; District of Columbia, 44; Illinois, 16; Indiana, 1; Iowa, 4; Kansas, 2; Louisiana, 1; Maine, 10; Maryland, 3; Massachusetts, 24; Michigan, 15; Minnesota, 7; Missouri, 7; Montana, 1; New Hampshire, 6; New Jersey, 14; New York, 98; North Carolina, 4; North Dakota, 2; Ohio, 13; Oklahoma, 2; Pennsylvania, 20; Rhode Island, 3; South Carolina, 2; Tennessee, 5; Utah, 1; Vermont, 1; Virginia, 6; West Virginia, 3; Wisconsin, 8 (total for United States, 338); Australia, 3; England, 2; Germany, 1; Scotland, 1; South Africa, 1; Sweden, 1.

There were 81 scientific sessions at the Ottawa meeting in addition to 11 field trips, most of which were scientific sessions in a different form, and 9 dinners and luncheons. The sessions were held in 25 rooms, all of which were in use on Wednesday morning. Of the 81 sessions for the reading of papers, 25 were devoted to the 18 symposia which were presented at the meeting. There were in addition 7 round-table discussions.

GENERAL SESSIONS

On Wednesday evening, June 29, Dr. Robert C. Wallace, principal and vice-chancellor of Queen's University, Kingston, Ontario, delivered the seventh Maiben lecture on the subject, "The Changing Values of Science." An audience that filled the large auditorium of Lisgar Collegiate Institute listened with rapt attention to Dr. Wallace's inspiring address.

The other general sessions of the Ottawa meeting were the four programs on "Science and the Future" which were organized and presented by the Section on the Social and Economic Sciences. The speakers at the first session were Dr. Stuart Rice, director of U. S. Central Statistical Bureau, whose subject was "World Standards of Living," and Mr. F. E. Lathe, of the National Research Council of Canada, whose subject was "World Natural Resources." At the second session, Dr. William Crocker, director of Boyce Thompson Institute for Plant Research, spoke on "The Botanical Sciences and the Future," and Dr. Frank R. Lillie, president of the National Academy of Sciences, spoke on "The Zoological Sciences and the Future." The third session was devoted to the physical sciences, Dr. Arthur H. Compton, of The University of Chicago, speaking on "Physics and the Future," and Dr. Harold C. Urey, of Columbia University, on "Chemistry and the Future." In the final session concrete applications of science to producing material things used and useful in the world were discussed by the heads of two great industrial laboratories, Mr. M. W. Smith, of the Westinghouse Electric and Manufacturing Company, and Dr. John Johnston, of the United States Steel Corporation. The subject of Mr. Smith was "The Application of Science to the Electrical Industry" and that of Dr. Johnston was "The Application of Science to the Metallurgical Field."

In all these discussions there were notes of triumph because of remarkable past achievements and expressions of confidence for the future, mingled as never before with feelings of responsibility for the welfare of society. One could not hear the brilliant addresses of these programs without feeling that the epics of our day are being written in the fields of science. It was particularly fortunate that the heads of two great industrial laboratories participated in the discussions, for it will be advantageous for scientists in general to learn how little difference there is between the science of industries and that of the somewhat secluded laboratories of universities. It will be advantageous, too, for university scientists to learn of the breadth of view and the sense of social responsibility of workers in industrial laboratories. And it will perhaps be surprising to representatives of industry to learn that the association is taking a deep interest in the fundamentals on which the industrial and economic life of the world depends.

SYMPOSIA

Including the "Science and the Future" program, which has just been mentioned, 18 symposia were organized and presented at Ottawa. In the order in which they appeared in the General Program of the meeting they are:

1. *Medical Biochemistry* (Section on Chemistry and Section on Medical Sciences. Dr. Harold C. Urey, chairman). "Hormones and Immunity" was discussed by Dr. W. R. Franks and Sir Frederick G. Banting; "Bio-electric and Other Physiological Responses of Insulin and Metrazol," by Drs. J. E. Goodwin, G. E. Hall, B. Leibel and D. P. C. Lloyd; "The Prolongation of the Action of Insulin," by Dr. Albert Fisher; "The Purification of Heparin," by Dr. Arthur Charles; "The Ketogenic and Anti-Insulin Properties of Anterior Lobe Extracts," by Drs. A. H. Neufeld and J. B. Collip; and "Studies on the Specific Metabolic Stimulant of Pituitary Extracts," by Drs. D. K. O'Donovan, O. F. Denstedt and J. B. Collip.

2. *The Nutrition Problem in North America* (Section on Chemistry. Dr. Harold C. Urey, chairman). "Physiological Functions of the Vitamins" was discussed by Dr. E. W. McHenry; "Determination of the Vitamin, Iron and Calcium Requirements of the Human," by Dr. Frederick F. Tisdall; "The Standardization of the Vitamin Content of Cod Liver Oil," by Drs. W. D. McFarlane and A. R. G. Emslie; "Maximum Efficiency with Minimal Diets," by Dr. I. M. Rabinowitch; "Evaluation of Canadian Feeding Stuffs," by Dr. C. J. Watson; "The Role of Pasture in Animal Nutrition," by Dr. E. W. Crampton; "Simplified Diets in Poultry Nutrition," by Dr. H. D. Branion; and "Effect of Diet and Other Factors on the Composition of Fat in the Bacon Hog Carcass," by Dr. R. D. Sinclair.

3. *The Application of Isotopes to Biochemical Problems* (Section on Chemistry and Section on Zoological Sciences. Dr. Harold C. Urey, chairman). "The Concentration of Isotopes" was discussed by Dr. H. G. Thode; "The Use of the Nitrogen Isotope for Biological Studies," by Dr. Rudolf Schoenheimer; "The Application of Deuterium to Intermediate Metabolism," by Dr. David Rittenberg; and "Pharmacological and Toxic Effects of Deuterium Oxide," by Dr. Henry G. Barbour.

4. *Atmospheric Ozone and Measurement of Ultra-Violet in Solar Radiation* (Section on Astronomy and Royal Astronomical Society of Canada). "Atmospheric Ozone as a Constituent of the Atmosphere" was discussed by Dr. B. Haurwitz; "Ozonosphere Temperatures under Radiation Equilibrium," by Dr. E. H. Gowan; "Atmospheric Ozone as related to Meteorology," by Dr. Chaim Pekeris; and "The Determination of Atmospheric Ozone from the Measurement of Ultra-Violet Solar Radition," by Dr. Brian O'Brien.

5. *The Migration of Salmon—and Conservation.* (Section on Zoological Sciences and Ecological Society of America. Dr. A. G. Huntsman, chairman). "The Atlantic Salmon of Europe" was discussed by Mr. W. J. M. Menzies, of Edinburgh, Scotland; "The

Pacific Salmon of Alaska and the Western States," by Dr. W. H. Rich; "The Pacific Salmon of British Columbia," by Dr. W. A. Clemens; "The Atlantic Salmon of the Gulf of St. Lawrence," by Dr. D. L. Belding; "The Atlantic Salmon of Nova Scotia and New Brunswick," by Dr. A. G. Huntsman; and "Factors Controlling Salmon Migration," by Dr. Henry B. Ward.

6. *The Relation of Insects to Forest Conservation* (Entomologists, Foresters and Forest Pathologists. Dr. J. M. Swaine, chairman). "Cooperation in Insect Studies Relating to Forest Conservation" was discussed by Dr. J. J. deGryse; "Some Economic Aspects of White Pine Blister Rust Control," by Dr. J. F. Martin; "The Relation of Insects and Other Biotic Factors to the Development of the Modern Forest," by Dr. S. A. Graham; "The Relation of Insects to Rehabilitation Plantations in Drought Areas," by Dr. N. D. Wygant; and "The Relation of Insects to the Conservation of Farm Woodlots," by Dr. R. B. Friend.

7. *The Genetics of Pathogenic Organisms.* Viruses, Protozoa, Bacteria and Fungi Pathogenic to Plants. (Section on Botanical Sciences, Section on Medical Sciences, Section on Agriculture, American Phytopathological Society and Genetics Society of America). *Viruses:* "Viruses Pathogenic to Animals" was discussed by Dr. E. A. Watson; and "Viruses Pathogenic to Plants," by Dr. L. O. Kunkel. *Protozoa:* "Genetics of the Parasitic Protozoa" was discussed by Drs. W. H. Taliaferro and C. G. Huff; and "The Influence of Host Constitution on the Parasite," by Dr. C. G. Huff. *Bacteria:* "Some Problems in the Genetics of Bacteria Pathogenic to Man" was discussed by Dr. G. B. Reed; "Some Examples of Hereditary and Environmental Influence on Bacterial Pathogenicity," by Dr. H. Konst; and "Genetics of Bacteria Pathogenic to Plants," by Dr. A. J. Riker. *Fungi Pathogenic to Plants:* Under the general title "The Origin of Parasitic Races of Phytopathogenic Fungi" there were the following four papers: "Origin through Adaptation," by Dr. D. Riddick; "Origin through Hybridization—in Smut Fungi," by Dr. H. A. Rodenhiser; "Origin through Hybridization—in Rust Fungi," by Dr. J. H. Craigie; and "Origin through Mutation," by Dr. J. J. Christensen.

8. *Micro-elements and Deficiency Diseases* (American Phytopathological Society and American Society of Plant Physiologists). Under the general title "Micro-elements in Nutrition of Plants" there were the following three papers: "Review of Literature," by Drs. M. B. Davis and E. P. Grant; "Micro-element Studies at Experimental Farm" (illustrated), by Drs. W. Ferguson and L. E. Wright; and "Microspectrographic Studies," by Dr. G. R. Giles. The remaining papers were as follows: "Spectrographic Analysis Applied to Trace Elements," by Dr. J. S. Foster; "Some Relations of Micro-elements to Animal Life," by Dr. E. J. Underwood; "Boron Deficiency Symptoms in Agricultural Plants in British Columbia," by Dr. H. R. McLarty; "Cytology of Deficiency Diseases with Special Reference to Boron," by Dr. J. Coulson; "Thallium Toxicity," by Dr. E. L. Spencer; and "Permeability of Host Cells in Relation to Fungus Parasites," by Dr. F. S. Thatcher.

9. *Phytogeographical Problems of Northeastern Canada* (Section on Botanical Sciences, Botanical Society of America and American Society of Plant Taxonomists. Dr. M. L. Fernald, presiding). "Botanical Evidence of a Post-pleistocene Marine Connection Between Hudson Bay and the St. Lawrence Basin" was discussed by Dr. David Potter; "The Phytogeographical Implications of the Flora of Northeastern Labrador," by Dr. Ernst C. Abbe; "Some Factors in the Isolation of Rare Plants," by Dr. V. C. Wynne-Edwards; "The Bic Florula and its Bearing on the General Problem," by Dr. Jacques Rousseau; and "The Mingan-Anticosti Phytogeographical Problem," by Frère Marie-Victorin.

10. *Root Rots and Seed Borne Diseases* (Canadian Phytopathological Society and American Phytopathological Society. Dr. H. W. Anderson, chairman). "Relation of Plant Pathological Technique to Seed Laboratory Practise" was discussed by Dr. R. Howard Porter; "The Incidence of Pathogenic Fungi in Seeds," by Dr. G. A. Scott; "The Rôle of Infected Seed in the Development of Seedling Blight and Root Rot in Cereals," by Dr. J. J. Christensen; "The Soil Microflora and other Factors Affecting the Development of Root Rot," by Dr. F. J. Greaney; "Root Development in Relation to Root Rot Diseases," by Dr. P. M. Simmonds; and "The Interrelation of Organisms to Root Rot," by Dr. G. B. Sanford.

11. *Drought Relations* (American Society of Plant Physiologists and Genetics Society of America). "Xerophytic Plants, their Evolutionary Origin from Mesophytes and their Possible Utilization in Culture or as Plant Breeding Material" was discussed by Dr. Walter T. Swingle; "Studies on the Physiology of Drought Resistance in Cereals," by Dr. A. G. O. Whiteside; "Similarities between Drought and Frost Resistance," by Dr. J. Levitt; "Water Absorption as a Factor in Drought Injury," by Dr. Paul J. Kramer; "Water Economy of Trees in Relation to Drought," by R. D. Gibbs; "Effect of Cultivation on Soil Moisture Relations," by Drs. W. J. Staple and J. Lehane; "Comparative Development of Drought Resistant Wheat Varieties under Varying Moisture Supply," by Dr. J. W. Hopkins; "Root Studies of Weed and Crop Plants," by Drs. T. K. Pavlychenko and L. E. Kirk; "The Problem of Breeding Wheat for Resistance to

Drought," by Dr. K. W. Neatby; "Triticum-Agropyron Hybrids for Drought Areas," by Drs. F. H. Peto and L. V. P. Johnson; and "The Influence of Moisture Supply on the Drought Resistance of Pine Seedlings," by Dr. Hardy L. Shirley.

12. *Science and the Future* (Section on Social and Economic Sciences). Program was discussed under the heading "General Sessions."

13. *The Influence of Fire on Forests, Wild Life and Public Welfare* (American Association, Ecological Society of America, Society of American Foresters and Canadian Society of Forest Engineers. Dr. C. C. Adams, presiding). "Fire and Forests" was discussed by Dr. Irvine T. Haig; "Fire and Wild Life," by Dr. Hoyes Lloyd; and "Fire and Land Use," by Dr. Herbert C. Hanson.

14. *The Present Status of the Psychology of Thinking* (Section on Psychology. Dr. George Humphrey, chairman). Under the general title of the symposium, three comprehensive papers were presented, after which there were discussions by invited speakers. Dr. George Humphrey discussed the history and development of this field in scientific psychology; Dr. N. R. F. Maier reported on animal and human experiments on the nature of reasoning; and Dr. S. N. F. Chant described recent experiments which separate analogical and analytical processes in reasoning.

15. *History of Science in Canada* (Section on Historical and Philological Sciences). "The Advance of Physics in Canada" was discussed by Dr. A. Norman Shaw; "The Beginnings of Chemistry in Canada," by Dr. W. Lash Miller; "Canada's Contributions to Botany," by Frère Marie-Victorin; "The History of Zoology in Canada," by Dr. J. R. Dymond; "The History of Geology in Canada," by Dr. Frank D. Adams; "The Growth of Astronomy in Canada," by Dr. W. E. Harper; "An Outline of the Progress of Mathematics in Canada," by Dr. Samuel Beatty; "Medical Research during the French Régime," by Dr. L. E. Pariseau; and "Why the Social Sciences Lag behind the Biological and Physical Sciences," by Dr. Joseph Mayer.

16. *Bacillus Calmette-Guérin* (B.C.G.) (Section on Medical Sciences). "B.C.G. Vaccine, Eleven Years' Experimental Work on Its Innocuity and Efficacy" was discussed by Dr. A. Frappier; "B.C.G. Vaccination of Cattle and Resistance to Tuberculosis," by Dr. E. A. Watson; "The Immunizing Properties of B.C.G. Vaccine in Bovines," by Dr. Allan C. Rankin; "Vaccination of Indian Children with B.C.G., Progressive Report," by Dr. R. G. Ferguson; "Twelve Years' Experience with B.C.G. Vaccine at the University of Montreal," by J. A. Baudouin; and discussion led by Dr. Wm. H. Park.

17. *Progress of Swine Improvement in Canada* (Canadian Society of Technical Agriculturalists and Canadian Society of Animal Production). "Advanced Registry for Pure-bred Swine" was discussed by Dr. A. W. Peterson; "Test Station Operation," by Dr. R. G. Knox; "Discussion of the Results of Station Testing in Canada," by Dr. J. G. Lefebvre; "Analysis and Interpretation of Carcass Results," by Dr. E. W. Crampton; "Discussion of Recent Investigations in Carcass Evaluation," by Dr. J. G. Stothart; and "Market Quality of Canadian Bacon," by Dr. L. W. Pearsall.

18. *Comparison of Nutritive Value of Pasture and Hay with Other Crops* (American Society of Agronomy. Dr. O. McConkey, presiding). "Problems in Evaluating Pastures in Relation to Other Crops," by Drs. H. L. Ahlgren, G. Bohstedt and O. S. Aamodt; "Comparative Cost of Total Digestible Nutrients in Pasture and Other Crops," by Drs. E. S. Hopkins and P. O. Ripley; "Seasonal Variations in Chemical Composition of Pasture, Hay and Grain from Different Regions in Ontario," by Dr. N. J. Thomas; "Relative Values of Alfalfa Hay and a Mixture of Concentrates for Milking Cows," by Dr. T. E. Woodward; "Methods of Evaluating Live Stock Feeds," by Dr. F. B. Morrison; "Remarks on Evaluation of Herbage and Pasture," by Dr. Paul E. Howe; and "Some Problems in the Determination of the Nutritive Value of Pasture Herbage," by Dr. E. W. Crampton.

A number of programs listed as round-table conferences did not differ greatly in their general plan from some of the symposia. Others were somewhat informal discussions of closely related subjects. The programs of several of the sections and societies were thoroughly organized in subject-matter, yet were not designated either as symposia or round-table conferences. For example, the Section on Geology and Geography had six sessions, each on a different well-defined field of geological interest. Since the council at the Indianapolis meeting last December authorized the publication by the association of such symposia as the executive committee may approve of, a clear formulation of the conditions under which a program should be designated as a symposium becomes important. Such a formulation is also important in preparing a balanced report of a meeting of the association. Perhaps the subject should be discussed and a definition given of the word symposium at the Secretaries' Conference at the Virginia meeting next December.

BUSINESS ITEMS

AT its first meeting on Monday, June 27, the council appointed Dr. Wesley C. Mitchell, president of the association, Dr. George D. Birkhoff, the retiring president, Dr. F. R. Moulton, the permanent secretary, Dr. Earl B. McKinley, member of the executive committee,

Dr. Herbert E. Ives, vice-president of the association and chairman of the section on physics, Dr. H. G. Moulton, formerly vice-president of the association and chairman of the Section on Social and Economic Sciences, to represent the association in discussions with representatives of the British Association for the Advancement of Science, at its Cambridge meeting in August, on the question of closer cooperation between the two associations and of other subjects of mutual interest.

At the same session the council adopted the following resolution:

WHEREAS: The American Association for the Advancement of Science, realizing the fact that the holding of international congresses or meetings for the purpose of discussing science and human welfare servers fundamentally to advance understanding among the nations, hereby approves in principle lending its influence and support to further the plans of such congresses or meetings when arranged or sponsored by any of its affiliated societies or by other organizations of corresponding standing.

The permanent secretary reported that the total membership of the association on June 21 was 19,307; on June 22, 1937, it was 18,353. Between the beginning of the fiscal year, October 1, 1937, and June 21, 1938, the names of 1,925 new members had been added to the rolls of the association; the estimate made last October for the number of new members that would be added in the entire year was 1,300.

The permanent secretary reported that 23 broadcasts were delivered between January 19, the date of the first broadcast of the series, and June 27, and that in response to written requests for copies of the scripts 143,400 had been sent out to listeners.

In response to a request from the World Education Federation, the council appointed Dr. Otis W. Caldwell, general secretary, and Mr. H. A. Carpenter to organize the program of the Science Section meetings of the Federation to be held in Rio de Janeiro, Brazil, in the summer of 1939.

The council appointed Colonel C. F. Craig, Tulane University Medical School, New Orleans; Dr. Mark F. Boyd, Rockefeller Institute for Medical Research, New York, and Dr. Louis L. Williams, U. S. Public Health Service, Washington, as a supervisory committee for the development of a three-year program on malaria, closing with a comprehensive symposium on the subject at the meeting in December, 1941.

For the purpose of increasing the service of the association to its affiliated academies of science, the council passed the following resolution:

Resolved, that the officers of the Association be authorized and instructed to offer to each of the affiliated Academies of Science the privilege of nominating for annual Honorary Junior Membership in the Association one boy and one girl from its junior academy or, if it has no junior academy, from junior science clubs within its territory; and that the Association in thus providing for Honorary Junior Memberships shall arrange so that during the period of honorary membership the honorary junior member shall pay no entrance fee or dues, shall receive a suitable certificate of membership, the copies of SCIENCE containing the preliminary announcements and the reports of the meetings, the programs of the meetings; and also Science News Letter, provided through the courtesy of Science Service.

The Committee on the Theobald Smith Award in Medical Sciences reported its selection of Dr. Charles F. Code, of the Mayo Foundation, Rochester, Minn., as the second recipient of the $1,000 award for his work on "Histamine in the Blood." The report was unanimously accepted by the council. The secretary of the Section on Medical Sciences was appointed to be secretary of the Theobald Smith Award Committee in Medical Sciences.

Dr. J. F. Dashiell, of the University of North Carolina, Chapel Hill, N. C., was elected by the council as vice-president of the association and chairman of the Section on Psychology.

Dean Edward Spease, of Western Reserve University, Cleveland, Ohio, was appointed a member of the executive committee of the Subsection on Pharmacy.

The council by unanimous vote accepted the British Columbia Academy of Sciences as an affiliated academy of the association. This is the first Canadian academy to be admitted as an affiliated academy. The number of scientific societies, academies and organizations now affiliated or associated with the association is 166.

Just before its final adjournment on June 30, the council, in appreciation of the courtesies extended to the association by the citizens of Ottawa and of Canada, unanimously adopted the following resolution:

The American Association for the Advancement of Science and its affiliated societies hereby express their deep appreciation to the citizens of Ottawa and of Canada for acting as hosts to the One Hundred-Second Meeting of the Association, which was held in Ottawa, Ontario, from June 27 to July 2, 1938, inclusive. At this meeting there were more than 100 scientific sessions before which nearly 500 papers were presented. The registered attendance exceeded 1,100, which ranks the Ottawa meeting among the largest summer meetings the Association has held.

Not only has the Ottawa meeting been exceptional in point of attendance and in number of scientific papers presented, but as the result of the work of a splendid Local Committee provisions for its scientific sessions and for the entertainment of members and their guests have been ideal. His Excellency, Lord Tweedsmuir, was Patron of the Meeting; Senator Raoul Dandurand, Honorary

Chairman of the Local Committee; Dr. C. Camsell was Chairman of the Local Executive Committee; Drs. A. Beauchesne and R. W. Boyle were Vice-Chairmen, Drs. A. Lanctot and H. M. Tory were Executive Members; and Mr. H. L. Trueman was Secretary. To the special Committee Chairmen, N. C. Allen, Finance; E. Rhoades, Publicity; F. E. Lathe, Program; T. A. McElhanney, Equipment; L. S. McLaine, Registration; C. H. Bland, Staff, and M. F. Gregg, Entertainment, the Association owes especial thanks for the great success of the meeting. Moreover, the Boy Scouts of Canada, alert and ever ready for action, rendered varied and effective services that helped make the machinery of the meeting function smoothly. All visitors will long hold pleasant memories of Ottawa as a delightful city and of its inhabitants as ideal hosts.

The meeting that was held this week is the fifth meeting of the Association in Canada, for the Association is American in the broad sense of the word. In science on this continent national boundaries are of no consequence. The participants in this meeting considered together in harmony and good will more fundamental things than political rivalries. If the spirit of this meeting extended throughout the world, many of the troubles that now afflict mankind would not exist.

The daily papers of Ottawa and of Canada, with fine discrimination of what is important and in the sincere spirit of science, have given this meeting a great deal of publicity. The Canadian Broadcasting Corporation has carried a number of broadcasts. In fact, from the very beginning of the preparation for this meeting to its close, the citizens and institutions of Ottawa and of Canada rendered services to the Association and its affiliated societies which the Council here gratefully but inadequately acknowledges.

SCIENTIFIC SESSIONS

SECTION ON PHYSICS (B)

(From report by Henry A. Barton)

Section B held three sessions, at which 16 papers were read, Herbert E. Ives, chairman of the section, presiding. The program, arranged by J. A. Gray, of Queen's University, Ontario, was unusually strong for a summer meeting. Visiting physicists enjoyed the opportunity of visiting the National Research Laboratories, in which the scientific sessions of the section were held.

The first session consisted of four short papers on such miscellaneous subjects as low frequency currents, specific heats of gases and applications of spectrophotometry to blood pigments, and a special paper by H. E. Ives on "The Unsymmetrical Doppler Effect in Hydrogen Canal Rays and its Significance in Optical Theories." Using canal ray tubes of the type devised by Dempster, Ives found that the displacement of spectral lines was exactly the amount predicted by the Larmor-Lorentz theory, according to which a moving clock runs slow. The next session consisted of three invited papers on sound, two on ultrasonic waves. F. H. Sanders presented a paper on "Passage of Ultrasonic Waves through Thin Plates," and R. W. Boyle presented one on "Ultrasonics—Marine Applications." The third paper, by H. E. Reilley, was on "Noise Abatement Problems in Canada." At the final session 8 short papers were read.

SECTION ON CHEMISTRY (C)

There were five sessions of the Section on Chemistry, the third of which was a joint symposium with the Section on Medical Sciences on "Medical Biochemistry" (item 1 under Symposia) and the fifth of which was a joint symposium with the Section on Zoological Sciences on "The Applications of Isotopes to Biochemical Problems" (item 3 under Symposia). The fourth session was devoted by the section to a symposium on "The Nutrition Problem in North America (item 2 under Symposia). The first session consisted of three papers on "Gas Reactions" and the second of six papers on miscellaneous subjects ranging from physical and chemical aspects of textile fibers to the refining of radium ores. A total of twenty-seven papers were presented before the section.

SECTION ON ASTRONOMY (D) AND ROYAL ASTRONOMICAL SOCIETY OF CANADA

(From report by Harlan T. Stetson)

The section and the Royal Astronomical Society of Canada held three sessions, the first two of which were general sesssions, and the third of which was a symposium on "Atmospheric Ozone and Measurement of Ultra-violet in Solar Radiation" (item 4 under Symposia). A total of thirty papers was presented. At the first session W. E. Harper, in his discussion of "Fifty Years of Astronomical Work in Canada," outlined the remarkable progress of astronomy in Canada from the days in which a small transit was the only official observing instrument to the present great 72-inch reflector at Victoria, B. C., and the 74-inch reflector at the David Dunlap Observatory. The remainder of the program included a wide range of subjects—the relation of terrestrial phenomena to the solar cycle; sunspot influence on the tree growth in Canada with correlations opposite in sign for the coastal regions from those for the interior; statistics on distribution of sunspots in longitude; a spectroscopic attempt to determine whether the greenish areas on Mars owe their color to vegetation, a negative conclusion being indicated; navigation near the pole; variable stars in globular clusters; orbits of spectrographic binary stars; solar rotation measurements; and radial velocities of certain stars.

SECTION ON GEOLOGY AND GEOGRAPHY (E) AND THE GEOLOGICAL SOCIETY OF AMERICA

(From report by Howard A. Meyerhoff)

The section held two sessions, one of five papers on "Regional Geography" and one of five papers on "Geo-

graphic Problems of the Northern Frontier," and four joint sessions with the Geological Society of America, the general subjects of which were "Physiography," "Aspects of the Mineral Industry," "Precambrian Economic and Stratigraphic Geology" and "Precambrian and Paleozoic Geology." In addition to the six formal sessions, several field trips were arranged, one of two and one-half days under the guidance of Morley E. Wilson to examine the Precambrian geology in the Madoc District; one to the laboratories of the Bureau of Mines; another, under the leadership of Dr. Alice Wilson, stratigraphically upward through the Paleozoic section of the Ottawa Lowland; and another, under D. A. Nichols, on physiography and geography, including an inspection of local pulp and power operation. Not satisfied with the six days allowed for the regular meetings and excursions, thirteen members of the section and its affiliated society extended their activities from July 2 to July 7 by a trip, arranged by Dr. Timm, director of the Bureau of Mines, and under the guidance of Mr. Parsons, to the Hollinger, McIntyre, Dome, Noranda, Wright-Hargreaves and other mines. The great success of the scientific sessions and the excursions, in which ninety persons participated at least in part, was due largely to Walter A. Bell and other Canadian geologists.

SECTION ON ZOOLOGICAL SCIENCES (F) AND AFFILIATED SOCIETIES

The Section on Zoological Sciences presented a symposium on "The Migration of Salmon—and Conservation" (item 5 under Symposia), a joint symposium with the Section on Chemistry on "The Application of Isotopes to Biochemical Problems" (item 3 under Symposia) and a joint program with the Ecological Society of America.

The American Association of Economic Entomologists, the Entomological Society of America and the Entomological Society of Ontario held a symposium under the chairmanship of J. M. Swaine on "The Relation of Insects to Forest Conservation" (item 6 under Symposia) and three joint sessions at which twenty-three papers were read. At the first session, under the chairmanship of Arthur Gibson, such varied subjects were considered as wireworms of Canada, wind drift and dissemination of insects, ticks as vectors of animal diseases and methods of estimating the populations of insects in a field. Before the second session, with A. L. Melander serving as chairman, papers were read on a variety of subjects, including "Increasing Demands upon Entomologists," "The Male Genitalia of Insects," "Thirty Years' Experience with Orchard Sprays in Nova Scotia," "Synthetic Compounds that Look Promising as Insecticides," "Ephemerid Coloration and Its Relation to the Time of Emergence" and "Insect Life as Recorded by the Motion Picture Camera." Dr. J. J. Davis was chairman of the final session before which nine papers were presented on such subjects as "The European Sawfly in Eastern Canada," "An Economic Appraisal of Grasshopper Outbreaks and Control in Saskatchewan; a Progress Report" and "Biological Control of Insects through Plant Resistance."

SECTION ON BOTANICAL SCIENCES (G) AND AFFILIATED SOCIETIES

(From reports by J. T. Buchholz, D. B. O. Saville and M. J. Adams)

The societies presenting programs in the field of the botanical sciences were the Canadian Phytopathological Society, the American Phytopathological Society, the American Society of Plant Physiologists, the Botanical Society of America and the American Society of Plant Taxonomists. The section held a joint symposium with the Botanical Society of America and the American Society of Plant Taxonomists on "Phytogeographical Problems of Northeastern Canada" (item 9 under Symposia). The section also held a session for the presentation of general papers, with Frère Marie-Victorin presiding. The program included ten papers. R. B. Thomson presented two illustrated papers. Phyllis Cook compared the oriental and occidental species of Thuja; J. T. Buchholz made an embryological comparison of two species of Sequoia. Jules Brunel gave an account of a most interesting study of the Desmid flora of a recent peat bog from a study by Frère Irenne-Marie, which disclosed, from samples taken at all times of the year, thousands of species of these microscopic plants. A. H. Hutchinson described a polygonal method of graphing ecological data by which the relationships of many complex variables affecting the environmental relationships of plants may be more adequately represented for comparison.

The sessions of the American Phytopathological Society took the form of three symposia held in cooperation with other groups. The first of these, entitled "The Genetics of Pathogenic Organisms" (item 7 under Symposia), was held with the sections on the Botanical Sciences, Medical Sciences and Agriculture and the Genetics Society of America. While discussion of the fungi was limited to plant pathogens and that of the protozoa to animal pathogens, viruses and bacteria were considered in connection with both plant and animal diseases. Of necessity the information presented dealt chiefly with the changes observed in pathogenic organisms and the permanence of such changes, since sexual reproduction and the possibility of true genetic studies is practically confined to the fungi. The close similarity observed in the findings of the workers in the

different fields was in itself an argument in favor of such combined sessions. One was left with the impression that in the simpler organisms, where reproduction is at least largely asexual, frequent variations (possibly true mutations) largely take the place of genetic changes brought about by hybridization. The production of new races of pathogens through adaptation to new hosts and through spontaneous variation was described for all types of organisms. New methods of technique have made it possible to separate numerous variants of some of the plant viruses; some of these persist indefinitely without reversion to the original type. Breeding work with the fungi is still in its infancy, but interesting reports on hybridization in the rusts and smuts showed that forms, new in both morphology and pathogenicity, can arise in this way and probably do so in nature; inheritance seems to obey Mendelian principles at least in part.

The second symposium, "Micro-elements and Deficiency Diseases" (item 8 under Symposia), was held in joint session with the American Society of Plant Physiologists. This session was largely concerned with the various disorders, especially in apples and turnips, caused by a deficiency of boron. It was shown that, although boron is now known to be essential to a great many important plants, no use has yet been proved for it in the animal body. Many of these minor elements, even if essential, are toxic if present in more than minute amounts. A disease of tobacco, similar to and perhaps identical with frenching, due to thallium toxicity was given as an example of this fact. Methods of spectrographic analysis for rapid estimation of various elements in plant issue and in soil were described.

The final symposium was held in conjunction with the Canadian Phytopathological Society, the subject being "Root Rots and Seed Borne Diseases" (item 10 under Symposia). Many figures showing the value of seed treatment and the high percentage of fungus infection sometimes found in prize-winning seed samples suggested the advisability of extending the scope of seed testing.

In the discussion of root rots the complexity of studies on this important group of diseases was stressed; the host, pathogen and soil microflora all influence each other.

At the garden party on Tuesday at the Central Experimental Farm, plant pathologists had an opportunity to examine exhibits of the Division of Botany and Plant Pathology of Canada.

Besides joining with the American Phytopathological Society in the symposium on "Micro-elements and Deficiency Diseases," the American Society of Plant Physiologists joined the Genetics Society of America in a symposium on "Drought Relations" (item 11 under Symposia) and in addition had a general program of six papers.

The Botanical Society of America and the American Society of Plant Taxonomists participated with the Section on Botanical Sciences in the symposium on "Phytogeographical Problems of Northeast Canada" (item 9 under Symposia). Papers bearing on the subject were presented by Ernst C. Abbe, V. C. Wynne-Edwards and Jacques Rousseau. In the absence of Frère Marie-Victorin, his paper on the Mingan-Anticosti Flora was presented by Jacques Rousseau. Owing to the absence of David Potter, his paper on a possible floral connection between James Bay and the Ottawa River Valley was not read. The general consensus of opinion was that the "nunatak" theory as a possible explanation of the discontinuity in the distribution of various plant species has been considerably overworked.

After the symposium there was a luncheon for all biologists in the Chateau Laurier, at which a large number of botanists and zoologists were present. The visitors were welcomed in a short address by A. G. Huntsman, of Toronto, to which E. G. Conklin, of Princeton, fittingly responded.

The garden party in the afternoon on the lawn of the Central Experimental Farm was one of the largest and most representative with which Ottawa has been honored. The weather was ideal and the musical program was supplied by the band of the Governor-General's Footguards. In addition to the tents for the catering service, there were two others containing exhibits of the various kinds of scientific work—botanical, entomological, etc.

For the field trips on three successive days typical plant habitats were chosen, the woods surrounding King's Mountain, the sandy soil at Constance Bay and the peat bog at Mer Bleue. In addition to a number of members of the staff of the Division of Botany and the National Herbarium at Ottawa, as well as Toronto University, there were also representatives from Cornell and Harvard Universities, the U. S. Bureau of Plant Industry, the Brooklyn Botanic Garden and the New York Botanic Garden. Scientists were present from states as far apart as Louisiana, Illinois and Maine. On the first trip after the visit to King's Mountain, most of the party traveled up the picturesque Gatineau Valley as far as Wakefield, then along the Lapêche River Valley as far as Masham Mills, and then across country through the hills to Eardley with several stops for the collection of plants. From Eardley the party returned along the base of the mountains to Ottawa, a total distance of about eighty miles. Although the weather turned slightly rainy on the day scheduled for the trip to Mer Bleue, and notwithstanding the fact that it was a national holiday, the excursion was one of the best attended of the three.

ECOLOGICAL SOCIETY OF AMERICA AND GENETICS SOCIETY OF AMERICA

The Ecological Society of America held two joint sessions with the Society of American Foresters and the Canadian Society of Forest Engineers. The first was for the presentation of a symposium on "The Influence of Fire on Forests, Wild Life and Public Welfare" (item 13 under Symposia) and the second was a general program, under the chairmanship of C. F. Korstian, of three papers on forest questions. These societies participated in field trips to Mer Bleue and the Petawawa Forest Experiment Station.

The Genetics Society of America joined with the Sections on Botanical Sciences, on Medicine and on Agriculture and with the American Phytopathological Society in a symposium on "The Genetics of Pathogenic Organisms" (item 7 under Symposia). It also presented jointly with the American Society of Plant Physiologists a symposium on Drought Relations (item 11 under Symposia) and it held a program of eleven cytogenetic demonstration papers.

SECTION ON ANTHROPOLOGY (H)

(From report by Diamond Jenness)

Section H held sessions on three days, at which nineteen papers were presented. The average attendance was eighteen. As was natural at a meeting held in Canada, problems relating to the anthropology and ethnology of that dominion had a prominent place. It was emphasized that prehistoric Canada has played two major roles: (1) that it has offered a home or a passage to ancient peoples migrating from Asia to America; and (2) that it has also been an area of specialization for certain tribes that evolved either within its borders or farther south. T. F. McIlwraith and J. F. Davidson described peculiar features in the religion of two of these tribes, while C. W. M. Hart analyzed the marriage arrangements of a third. Definite cultural links between Asia and America are notoriously hard to establish, but C. M. Barbeau emphasized the close resemblances between the dirge songs of the Northwest coast and old Buddhist chants in China and Mongolia, while Earl Count showed that some folk-lore motifs common to America and Eurasia have apparently stemmed from a common source. Certain writers have ascribed a Siberian origin to the Woodland pottery of eastern Canada and the northeastern United States, but W. J. Wintemberg drew attention to the vast potteryless gap in northern Canada that we must bridge before establishing a connection between the two regions. The vexed question of the origin of the Iroquois was reopened by J. Griffin, who suggested that present archeological and linguistic evidence does not support the hypothesis of a middle Mississippi homeland, and that the Iroquoians may have developed from a Woodland background. D. Leechman described some new discoveries of Dorset Eskimo remains in the Arctic. A very important contribution to the problem of early migration in the Western Hemisphere was made by Junius Bird, who suggested that if the earliest Indians to occupy South America were ignorant of water transport and traveled solely on foot, as seemed to be indicated by his discoveries around the Straits of Magellan, then we should eliminate the Amazon basin from their route and seek their traces in northern Peru along the western side of the Marañon valley.

Three papers dealt with those cultural conflicts and interchanges of primitive with advanced groups that are as important to the practical administrator as to the anthropologist. In the field of physical anthropology, Saunders and Count outlined a new method of graphing dimensions and indices, and J. C. B. Grant described the Stony Indians of Alberta, whose blood-grouping differs quite unaccountably from that of the neighboring Blackfoot. W. M. Krogman offered an outline of the ethnic photohistory of the Near East by stating a chronological sequence of racial types, beginning with the South Europid, which was uniformly present by 4000 B. C. or earlier, the North Europid, which became an important element only in the middle or late 34th millennium B. C., the Central Europid, which came in between 3000 and 2500 B. C., and the Armenoid, which did not appear in Western Asia until about 500 B. C.

At the close of the session several members of Section H accepted the invitation of Dr. C. T. Currelly to visit the Royal Ontario Museum of Archeology in Toronto, whose magnificent Chinese collections had formed the subjects of several papers during the meetings.

SECTION ON PSYCHOLOGY (I)

(From report by Leonard Carmichael)

The Section on Psychology (I) held six scientific sessions from Tuesday to Thursday. Two of these sessions were held jointly with the Section on Education (Q). A dinner for psychologists was held on Wednesday evening under the chairmanship of E. A. Bott, of the University of Toronto. At this dinner, a new Canadian Psychological Association was formed. A detailed announcement concerning the formation of this association, the officers selected, and so forth, will be found elsewhere in SCIENCE.

Probably the most notable part of the scientific session was a symposium (item 14 under Symposia) organized and directed by George Humphrey of Queen's University on the present status of the psychology of thinking. Professor Humphrey himself contributed the first paper of the symposium. He dealt with the history and development of this field in scientific psy-

chology. He pointed out that the subject of thought, technically defined, has received too little attention by professional psychologists in recent years. N. R. Maier, of the University of Michigan, reported on certain animal and human experiments regarding the nature of reasoning which seem clearly to show the distinction between reasoning and memory. S. N. F. Chant, of the University of Toronto, described certain of his recent experiments, which include the separation of analogical and analytical processes in reasoning. After these three major papers, there was a series of brief statements given by those who had been asked in advance to discuss the papers. The second section on social psychology was under the direction of E. A. Bott. The detailed program of papers presented at this session and at the other sessions of the section has been published elsewhere in SCIENCE. This is also true of the joint session with the Section on Education (Q), held under the chairmanship of J. G. Althouse. The sessions on general psychology and learning, under the chairmanship of J. G. Beebe-Center, included a series of theoretical and experimental papers. In one of these papers, Frère Philip, of LaSalle College, Philadelphia, described the application of certain mathematical procedures, first devised for the treatment of earthquake records, to the study of the periodicity of the high-speed continuous work of human subjects. The session on physiological psychology and problems of adjustment was under the chairmanship of Leonard Carmichael, of the University of Rochester. The final session of the program on vocational selection and tests was under the chairmanship of R. B. Liddy, of the University of Western Ontario.

In all, thirty-three major papers were presented before the section. The meetings of the section were held, through the kindness of the authorities of the University of Ottawa, in the lecture rooms of that institution. The programs were marked by excellent discussion, and all in all the meeting of Section I at Ottawa must be considered as one of the most successful summer meetings of the section ever held. To E. A. Bott goes the entire credit for the excellent arrangement of the program.

SECTION ON SOCIAL AND ECONOMIC SCIENCES (K) AND THE AMERICAN STATISTICAL ASSOCIATION

(From the report of Frederick F. Stephan for the latter)

The program of the Section on Social and Economic Sciences consisted of four sessions on "Science and the Future," this being the second conference of a series of five conferences on the general subject "Science and Society." These sessions, held in the auditorium of Lisgar Collegiate Institute, all had the character of General Sessions, described earlier in this report.

The program of the American Statistical Association linked Canadian and American statisticians and economists in a discussion of timely subjects. The program opened with a critical examination of the statistical series that may be used in comparing the fluctuations of economic conditions in Canada and the United States, presented by D. C. MacGregor, of the University of Toronto. In the second paper at the opening session Walter Gardner, of the Board of Governors of the Federal Reserve System, analyzed the influence of the United States on the course of business in Canada, emphasizing monetary and financial relationships between the two countries.

The second session was devoted to a scrutiny of the business outlook with special reference to the effects of government spending. Three speakers participated: Leonard P. Ayres, of the Cleveland Trust Company, Corrington Gill, of the Works Progress Administration, and Courtland Elliott, of A. E. Ames and Company.

Retail and wholesale trade was the subject of the third session. H. Marshall, of the Dominion Bureau of Statistics, discussed the methods and some of the results of the Canadian Census of Merchandising and Service Establishments and the Annual Survey of Retail Trade. The patterns of wholesale and retail trade in Canada and the United States were compared by Vergil Reed, of the U. S. Census Bureau. Willard Thorp, of Dun and Bradstreet, discussed the need for adequate statistics of inventories and business credit and by way of illustration presented a number of points on which current conceptions are at variance with the facts reported in recent studies.

The American Statistical Association joined with the Canadian Agricultural Economics Society and the Canadian Society of Technical Agriculturalists in a session on weather and crop yields. A survey of crop-weather research in the United States was presented by C. F. Sarle, of the Bureau of Agricultural Economics. The relationship between weather factors and wheat yields was discussed with respect to western Kansas by George Montgomery, of Kansas State College, and with respect to western Canada by C. F. Wilson, of the Dominion Bureau of Statistics.

SECTION ON HISTORICAL AND PHILOLOGICAL SCIENCES (L)

(From report by Joseph Mayer)

With the able assistance of Lawrence J. Burpee, of the International Joint Commission, a program was arranged on which eight Canadian scientists presented papers in a two-session symposium on the "History of Science in Canada" (item 15 under Symposia). H. M. Tory presided at the morning session and Joseph Mayer at the afternoon session. The latter delivered the ninth paper, the closing address, on

"Why the Social Sciences Lag Behind the Biological and Physical Sciences."

The papers of the symposium covered the most important scientific advances in Canada from mathematics through biology, some of the developments being illustrated with appropriate lantern slides. The paper on the progress of mathematics in Canada dealt largely with instructional problems and gave examples of examination questions prepared for present-day students and for those of thirty years ago. The advance of physics in Canada was broadly outlined and pictures of modern laboratories and other university facilities were presented. The beginnings of chemistry in Canada were shown with a delightful humor in the presentation of colorful early episodes in chemical progress. The character and work of the scientists who contributed most to the development of botany and zoology in Canada were outlined in some detail. And the growths of Canadian geology and astronomy were likewise well portrayed. Finally, the character of medical research in Canada during the French régime was described in a most interesting manner, and rare manuscripts and books bearing upon this period were exhibited. It is anticipated that these eight papers of the symposium will be printed in one volume under the editorship of Dr. Tory.

SECTION OF ENGINEERING (M) AND INSTITUTE OF AERONAUTICAL SCIENCES

(From report by Norman Marr)

The Section on Engineering (M) held one session with four papers on widely diverse subjects. About eighty persons attended this session. The first paper dealt with the collapse of the Falls View Bridge at Niagara Falls during extraordinary ice conditions in the Niagara river in January, 1938. The second paper discussed mining, concentration and transportation operations in connection with mining and treating radium-bearing ores on Great Bear Lake in the sub-Arctic region of northern Canada. The third paper described some instrumental aids to mapping from air photographs as practised in Canada. The fourth paper dealt with some aspects of applied science from the viewpoint of an electrical engineer.

Serving for A. A. Potter as chairman of the section was G. J. Desbarats, immediate past-president of the Engineering Institute of Canada, and Norman Marr, chief hydraulic engineer, Dominion Water and Power Bureau, Department of Mines and Resources, Ottawa, acted as secretary.

The program of the Institute of the Aeronautical Sciences consisted of three sessions, at which nine papers were presented. At the first session I. I. Sikorsky read a paper on "Flying Boats"; T. R. London, one on "Photoelastic Stress Methods"; and G. J. Klein, one on "Snow Performance of Aircraft Skis." The second session consisted of a paper on "Detonation" by C. S. Draper and one on "Aircraft Fuels" by S. D. Heron and of motion pictures of Langley Field with explanatory comments by Lester D. Gardner. The program on aids to flying consisted of the following papers: "The Radiometeorograph," by W. R. Gregg, "Meteorological Services for Trans-Canada Airway," by J. Patterson, and "The Cathode Ray Compass," by J. T. Henderson.

SECTION OF MEDICAL SCIENCES (N) AND SUBSECTION ON PHARMACY

(From report by Malcolm H. Soule)

The section on Medical Sciences joined on Monday with the Sections on Botanical Sciences and Agriculture, the American Phytopathological Society and the Genetics Society of America in a symposium on "The Genetics of Pathogenic Organisms" (item 7 under Symposia). More than eighty persons attended each of the two sessions. On Tuesday a symposium was held by the section on "Bacillus Calmette-Guérin (B.C.G.)" (item 16 under Symposia). Wednesday morning the section combined with the Section on Chemistry (C) in a symposium on "Medical Biochemistry" (item 1 under Symposia).

Two papers dealing with the ultraviruses introduced the first symposium. These invisible agents, which in many instances are of molecular dimensions, are generally accepted as living entities. Those that are well known produce specific diseases such as influenza, yellow fever and rabies in animals and tobacco mosaic in plants. As a matter of fact, disease production is the only index of their existence. All agreed that at present little significance can be attached to the genetics of such tiny forms. However, differences in strains of particular viruses are well recognized and changes may be induced by passage through different hosts. In this connection E. A. Watson stated that the same strain of equine encephalomyelitis virus by serial passage through guinea pigs, mice and chick embryos exhibits three strikingly different degrees of virulence, the chick embryo strains being most potent.

Papers dealing with the protozoa, bacteria and fungi pathogenic to plants followed, with a total of eleven contributions. These larger forms may be seen easily under the microscope, and in most instances they give rise to macroscopic growths when cultured on laboratory mediums. All in attendance agreed that there are many problems of mutual interest and that the symposium was of great value in bringing the group together. It was repeatedly emphasized that the plant diseases are superior for experimental work because of the unlimited numbers that may be employed at any one time, the ease of controlling the hosts and the low costs.

The holding of the second symposium at this time

and in Ottawa was of particular significance. When Calmette first introduced the Bacillus Calmette-Guérin (B.C.G.) as a prophylactic measure against tuberculosis in France, over fifteen years ago, there was considerable criticism. This technique utilizes a living attenuated culture of the tubercle bacillus. On many occasions it has been pointed out that the viable germ, though apparently harmless, might regain its virulence without warning, and when fed to the infants for purposes of protection might in reality produce active infections with subsequent death. The Canadian investigators undertook to confirm the experiments of Calmette under carefully controlled conditions. A very thorough and ambitious program was projected under the immediate supervision of the Research Council, and experiments in the field of veterinary medicine were included. The data that have been gathered over a period of thirteen years were presented in six papers. Wm. H. Park, of New York City, in discussing the results drew attention to the fact that the figures did not give unequivocal proof that children or calves injected with B.C.G. were solidly protected against exposure to active tuberculosis. There was general concurrence in the opinion that there is no danger attendant with this method provided the organisms are cultured under the conditions originally described. Dr. Park urged that the Canadian workers continue their experiments, for with the passage of time sufficient data will accumulate to permit of more certain conclusions.

Six papers composed the symposium on "Medical Biochemistry." They were by individuals from the medical research institutions at Toronto and Montreal and dealt with the fundamental problems of some of the hormones, particularly insulin and pituitary extracts, as well as the purification of the anticoagulant heparin. Attention was drawn to the possibility that the continued use of insulin by diabetics might elicit the production of neutralizing antibodies and thus render it inert as a reagent for the control of sugar metabolism. These papers only served to emphasize the outstanding achievements of these workers and their continued productivity in the field of medical research.

SECTION ON AGRICULTURE (O) AND AFFILIATED SOCIETIES

(From reports by Henry Clepper, H. G. Crawford, M. F. Morgan, C. D. MacKenzie, J. M. Armstrong and F. S. Browne)

The Section on Agriculture participated with the Sections on Botanical Sciences and Medical Sciences and with the American Phytopathological Society and the Genetics Society of America in the symposium on "The Genetics of Pathogenic Organisms" (item 7 under Symposia).

The second annual summer meeting of the Society of American Foresters was held jointly with the Canadian Society of Forest Engineers, the Association of Forest Engineers of Quebec and the Woodlands Section of the Canadian Pulp and Paper Association. Approximately 150 members of these related organizations were present.

In general, the problems of forestry and related fields were discussed in four principal parts: (1) sessions of interest mainly to foresters and forest engineers and devoted to forest administration, management, classification, research, surveys, reforestation and flood control and silviculture; (2) a joint session with forest entomologists and forest pathologists; (3) two joint sessions with the Ecological Society of America, one of which was a symposium on "The Influence of Fire on Forests, Wild Life and Public Welfare" (item 13 under Symposia); and (4) a field trip to the Petawawa Forest Experiment Station.

The two-day field trip to the Petawawa Forest Experiment Station afforded an opportunity to observe Canadian forest research in silvicultural practices, thinning and improvement cuttings, plantations, and disease, insect and fire control.

In all, twenty-seven papers, supplemented by prepared discussions, were presented by forest workers. Arrangements were made to publish the complete proceedings of the sessions in the October, 1938, issue of the *Journal of Forestry*.

The Canadian Society of Technical Agriculturists, in cooperation with the Canadian Society of Animal Production and the Canadian Agricultural Economics Society, held ten sessions, of which one was a symposium on "Progress of Swine Improvement in Canada," one a round-table discussion by the Engineering Group and one a joint session with the American Statistical Association on the general subject, "Weather and Crop Yields." At the ten sessions fifty-three papers were presented.

The program of the Horticultural Group consisted of miscellaneous papers on horticulture. During the first day the subject of northern horticulture was dealt with by W. D. Albright and E. T. Goring. This subject proved of unusual interest, for most of those present had little or no conception of the achievements in horticulture along the northern limits of civilization on this continent.

A new method for the evaluation of spray materials for apple trees was presented by C. E. Petch, by which the amount of marketable crop, together with vigor and growth of the tree, is used as the measure rather than actual disease and insect control.

In a progress report on the breeding of potatoes for disease resistance, J. L. Howatt stated that very satisfactory progress has been made at the Dominion

Experimental Station, Fredericton, New Brunswick. A large number of highly resistant seedlings has been obtained from the hybridizing of several species, many of which appeared to possess desirable characters for commercial use.

Other papers were presented on storage investigations of tomatoes and celery, weed control in lawns, rootstock and scion relationship of apple trees, nutrient requirements of peaches, rapid soil tests for tobacco soils and cropping practices for flue-cured tobacco.

At the business session Dr. A. F. Barss, of the University of British Columbia, Vancouver, British Columbia, was elected chairman of the group for the year 1938–39, succeeding Dr. C. F. Patterson, of the University of Saskatchewan, Saskatoon, Saskatchewan.

Two sessions of the Canadian Society of Animal Production (Eastern Section), an affiliated body of the Canadian Society of Technical Agriculturists, were held, the former including business, reports and addresses, while the latter was a symposium on "The Progress of Swine Improvement in Canada" (item 17 under Symposia). At the program of the second session, which included six papers, the policy of the Dominion Department of Agriculture with regard to the Advanced Registration of pure-bred swine was outlined, and the several papers included the results of its operation at different centers, relating to progress in breeding, nutritional, carcass evaluation and market quality studies. The papers presented are expected to appear in *Scientific Agriculture* at an early date. The president and secretary-treasurer elected for the forthcoming year are R. G. Knox, Ontario Agricultural College, Guelph, Ont., and C. D. MacKenzie, Central Experimental Farm, Ottawa, Ont., respectively.

The meeting of the Agricultural Engineering Group provided an opportunity for the discussion of farm power and machinery problems in eastern Canada. Discussion on "Mechanical Problems for the Agricultural Engineer" indicated the desirability of combining certain field operations, the development of machines to meet new needs and more extensive testing of equipment over a wide range of conditions. The topic "Tractors for the 100-acre Farm" was also discussed from the angle of individual ownership, hiring of tractor and available work on small farms.

Prospects for "The Small Combine-Harvester in Eastern Canada" were reviewed in the light of recent developments in these machines and farmers' experience with small combines in Ontario in 1937. Under the title "Drying of Forage Crops" the meeting was given an interesting account of the development of a bin-type drier for hybrid seed corn and its adaptability to tray-drying of grass crops. In a paper on "Agricultural Engineering Services in Canada," attention was called to the fact that the farm demand for assistance of an engineering nature is definitely on the increase. Agricultural engineers were urged to attend first to improvements likely to increase production per man as the surest way to increased farm profits.

The meeting of the American Society of Agronomy, with an attendance of 125, was in the form of a conference relative to the evaluation of comparative nutritive value of pasture herbage, hay and other livestock feed crops. Papers presented by O. S. Aamodt, P. E. Howe and T. E. Woodward all brought out the limitations of present standards of comparative evaluation, both on the basis of total digestible nutrients and calorimetric measurements. F. B. Morrison, in an especially stimulating paper based on his classical studies along this line, presented the concept of *net energy values*. N. J. Thomas discussed the great variations in fattening quality of pasture herbage, irrespective of the quantity of feed produced. He suggested that the lignin content may be much more important than the conventional "crude fiber" expression. E. W. Crampton showed that small "pilot" feeding trials with rabbits may be used to facilitate research in determining the nutritive value of pasture herbage.

Steps were taken toward the formation of a joint committee of various organizations interested in standards of measurement in the determinations of nutritive value of pastures and crops.

The Northeastern Section, American Society of Agronomy, with an attendance of about 40, held a brief business meeting, at which officers were elected and a meeting place for 1939 was discussed. This group visited the Dominion Farms on Thursday afternoon.

SECTION ON EDUCATION (Q)

(From report of J. E. Robbins)

A major share of the time of the sessions of the Section on Education was given to Canadian problems, twenty-six of the thirty-five papers presented being by Canadian authors. The attendance included representatives from all but one of the nine provincial Departments of Education, and from Newfoundland, thus giving to the discussions a thoroughly representative character. This had a special value for the round-tables on elementary and secondary curricula and for a luncheon meeting which explored the question of establishing a Canadian council on research in education, the central purpose of these meetings being an exchange of views among educators from the widely separated parts of the Dominion. Complete curriculum revisions have recently been made, or are in process of being made, in a majority of the provinces and an opportunity for exchange of experience

was welcomed. Reports also of several interesting experiments in curriculum were heard from New York educators.

Dr. H. F. Munro, president of the Canadian Education Association, told the luncheon meeting there was good reason to hope that it would be followed, at the association's biennial meeting in August, by an announcement of the establishment of a Canadian Council for Educational Research, and Mr. C. N. Crutchfield, general secretary of the Canadian Teachers' Federation, pledged the support of the national teachers' organization in the project.

A program on visual education included consideration of the museum as an aid in teaching, as well as the several varieties of projection apparatus that are coming into increasing use in the classroom. A representative of the National Film Society of Canada reported on the society's plans to assist educational authorities, and the Quebec Department of Education gave a demonstration of the use of films, with the assistance of the Associated Screen News of Montreal.

A session on organization and administrative problems in Canadian education included three descriptive papers dealing with Newfoundland, Protestant Quebec and rural Ontario, respectively. A fourth contribution analyzed the relationship of the Dominion Government to education, and a fifth set out a program of teacher-training in the use of visual aids. Two others were statistical studies, one on the sociological consequences of the organization of a large unit of rural administration in Manitoba, and the other summarizing the results of an exhaustive study of data on illiteracy from the decennial census.

Two joint sessions with the Section on Psychology were held, one on child study and pre-school education, the other on vocational selection and tests. The subject-matter of these discussions was less local in character and less concerned with the problems peculiar to Canadian education than in the case of the other sessions, though seven of the thirteen papers were of Canadian origin. Reference to these sessions is also made in the report of the Section on Psychology.

OBITUARY

FRANK LAMSON-SCRIBNER

FRANK LAMSON-SCRIBNER, who died on February 22, was born in Cambridgeport, Massachusetts, on April 19, 1851. From the time of his earliest recollection he loved the "out of doors" and plants and flowers in particular. This love of nature grew as he grew and as he came to mature years dominated his life. His interests in natural history led him into the fields of higher education. After completing high school he entered the University of Maine, graduating with a B.S. in 1873. In 1920 his Alma Mater conferred upon him, for his distinguished service to science and to agriculture, the degree of LL.D. After completing his undergraduate work at the university he took up school teaching in Maine. In 1877 he was called to Girard College, Philadelphia, where he continued his interest in botany and horticulture in what was then the center of interest in those fields in the United States. He remained there and did notable work until 1885, when he came to the U. S. Department of Agriculture as assistant botanist. He received his appointment as the result of a competitive civil service examination. The department had been organized in 1862, but was just beginning to be recognizd as a promising scientific institution. The botanical work under Dr. George Vasey was soon enlarged to include plant diseases, and Lamson-Scribner became the first chief of that section. His work in that field 1886–1888 is still recognized as standard and as laying the foundations of the great developments that have followed.

As a result of his fine record he was called to the University of Tennessee as professor of botany and horticulture, 1888–1894. He was director of the Experiment Station from 1890 to 1894.

He was called back to the Department of Agriculture in 1894 as chief of a new division, "Agrostology," for the study of forage plants. He did excellent work in developing this field of agricultural science on a basis of practical value to farmers. In 1901 he was selected as chief of the Insular Bureau of Agriculture of the Philippines, where he remained for four years and built up an excellent organization adapted to handle the intricate problems of the agriculture of those islands. Expressions of appreciation of his great services came from the Philippine Government and people and from those in the United States charged with responsibility at that time. After completion of his work, 1904, in the Philippines he returned to the United States Department of Agriculture as special agent and agrostologist from 1904 to 1922.

It was in the early part of this period that he renewed his interests in exhibit work, which began at the history museum at Carlisle, Pennsylvania, 1927–28. He had general charge of the Lewis and Clark Exposition, 1905; Jamestown Exposition, 1907; Alaska Yukon Exposition, 1909; Buenos Aires Centenary Exposition, 1910; U. S. Department of Agriculture, representative Turin Exposition, 1911; member of the U. S. Government Exposition Board, Pan Pacific Exposition, 1915; director of exhibits, U. S. Depart-