

These sessions were intended to give a cross section of upper atmosphere research in Canada. The morning session spanned the breadth of this activity with papers on three broad areas of activity: in the government, universities, and industry. The afternoon session examined one aspect of Canadian work in depth; four papers described research on radiation exchange problems of the atmosphere which are being conducted by one governmental research establishment.

The first paper of the morning session discussed results of the Canadian Alouette I satellite. Three specific findings were described. The first is the occurrence of troughs in the ionosphere which appear as minima in electron density contours at the F-layer. Second, the results of an experiment with a very low frequency receiver revealed that an analysis of the noise measurements made by this receiver will yield the fractional abundance of positive ions and their temperatures in the immediate vicinity of the satellite. Finally, the rather unusual motion of the spin axis of Alouette I was attributed to gravity gradient effects on the long, flexible antennas attached to the satellite.

The second paper covered research currently in progress at the University of Saskatchewan. Several special spectrometers were described for measurements of the aurora; the results of investigations of the upper atmosphere with these instruments were discussed in detail. Finally, a laboratory simulation of the interaction of the solar plasma with the earth's magnetic field was outlined. Results show the possibility of yet undiscovered phenomena in the satellite probing of the earth's radiation belts and magnetic field. The same technique was used to study the ionsheath surrounding a spacecraft, and resulted in a possible method of minimizing the sheath by a very simple technique.

The afternoon session opened with discussion on the results of airborne, infrared solar spectroscopy. Atmospheric constituents were analyzed from spectra in the 2.35- to 3.40-micron region. Water vapor concentration was investigated in detail; statistical evidence was presented for variations in abundance near the tropopause, including limits on this variation in the Cape Kennedy, Florida, area. The second paper dealt with balloon-borne spectral measurements of the infrared airglow at 100,000 feet

from 2 to 9 microns. Due to unexpectedly strong daytime emission, the hydroxyl data were discussed in detail.

The last two papers dealt with oxygen and ozone content in the upper atmosphere. Nitric oxide gas was released from a rocket at altitudes of 75 to 125 kilometers. The resulting chemiluminescent reaction was measured spectrometrically from the ground to determine the profiles of atomic oxygen concentration. Finally, a theoretical study was presented of the ozone distribution in the atmosphere, including vertical profiles in the absence and presence of water vapor for differing geographical locations and seasons.

PHILIP A. LAPP, *Program Chairman*

Chemistry (C)

The program of the Chemistry Section (C) consisted of two two-session symposia (29–30 December 1964).

Problems of Hydrogen Bonding. This symposium, held on 29 December, was arranged by Camille Sandorfy (Université de Montréal). It included six invited speakers who came from Canada, France, and the United States. Topics ranged from theoretical aspects to new developments in hydrogen bonding. For a more complete account of this meeting, see page 910.

Stereospecificity. In the introductory lecture, E. L. Eliel (University of Notre Dame) defined the basic terms "stereoselectivity" and "stereospecificity" on thermodynamic grounds and illustrated these concepts with appropriate examples. A. Moscowitz (University of Minnesota) reviewed next the theory of optical rotation and outlined the relations between the molecular geometry and the corresponding rotational strengths.

J. C. Bailar (University of Illinois) discussed stereospecific reactions between optically active coordinating agents and metal ions relating to octahedral chelate complexes; the stereochemical effects were shown to be associated with puckered rings and their biological significance was discussed.

The symposium was highlighted by the lecture of M. Goodman (Polytechnic Institute of Brooklyn) who showed how conformational details of polymers can be deduced on the basis of high resolution nuclear magnetic resonance and from an analysis of rota-

tory dispersion and circular dichroism data.

B. Belleau (University of Ottawa) discussed stereospecificity as it relates to enzyme reactions, including systems in which the enzyme can readily discriminate between two chemically identical hydrogen atoms attached to the same or two contiguous atoms. In the final lecture on protein synthesis, J. H. Spencer (McGill) emphasized the stereochemical relations between the nucleotide sequences of various types of nucleic acids and the translation of the genetic code from nucleic acids to proteins.

ALEC SEHON, *Program Chairman*

Geology and Geography (E)

Thanks to the leadership of both the active and retiring vice presidents of the section, the program chairman, and Canadian earth scientists in general, the Section E program (27–30 December 1964) at Montreal was unusually successful.

The symposium on Medical Geology and Geography attracted so much attention that a pre-symposium press conference had to be called by Harry Warren and his speakers. The conference was a "sell-out," ran overtime, and reporters filed unusually long stories. A large audience heard five scientists report on their research. In essence, all five declared that only the barest beginnings have been made in understanding the role of trace elements in health, and all speakers underlined the need in this case for the interdisciplinary approach. Indeed, at this very Montreal meeting, Section Nd (Dentistry) presented a four-session program, cosponsored by Section E, entitled "Environmental Variables in Oral Disease." Several of the papers dealt with phenomena, such as variations in soil and sources and purity of water supply, ordinarily under the purview of geographers and geologists.

The two sessions of invited papers in geography, organized by John Parry for the Canadian Association of Geographers, were divided into physical geography and human geography. Visitors had a fine opportunity to learn the details of the almost fantastic growth of Montreal and the ways in which such growth is being shaped by the city's unusual setting.

The forenoon session (29 December) of papers entitled "The Mineral Renaissance of Eastern Canada" traced

the current situation of several minerals or mineral groups and listeners went away with a strong impression of renaissance, indeed! The afternoon session involved papers covering various lines of investigation of the earth's upper mantle. Canadian geologists and geophysicists and geochemists are to be congratulated upon the vigor with which they are attacking fundamental problems within earth science—terrestrial heat flow, crustal zoning and thickness variation, magmatic differentiation, geomagnetic variation, and gravity variation. The vagaries of geologic history have provided earth scientists of eastern Canada with a splendid natural laboratory, and present-day workers are worthy successors of the great Sir William Logan.

The Section E dinner, arranged by a committee under the direction of Trevor Lloyd, was attended by 80 persons. The retiring vice-presidential address, entitled "Minerals potential of Alaska," was delivered by John Reed. "Location and transportation are the key factors," contends Reed. An address by Robert Legget appealed for cooperation and mutual understanding between geologist and engineer. Legget's address was replete with well chosen anecdotes to entertain yet effectively illustrate his points—the Leda clay is a phenomenon, indeed!

The session of contributed papers in geology which closed Section E's program (30 December) was well-balanced, and attendance was good. The excellence of the papers attests to the need to accept contributed papers in spite of difficulties in arranging these sessions.

The Section E committee meeting was attended by twelve interested individuals who contributed many excellent suggestions for a program in Berkeley in December of 1965. A nominating committee headed by Joe Webb Peoples was ready with its report and the advisory committee was pleased to elect Harry Ladd (U.S. Geological Survey) as vice president of the Section for 1965. Richard H. Mahard was reelected as section secretary for the period 1965–68. The section secretary would greatly appreciate correspondence from persons who are interested in contributing to the success of the Berkeley meeting; most particularly we are interested in ideas for symposia of five to eight papers.

RICHARD H. MAHARD, *Secretary*

Zoological and Botanical Sciences (FG)

Ecological Society of America (FG4)

The Ecological Society of America met at Montreal with the AAAS and sponsored an extensive series of papers on animal behavior. There were, in addition, symposia on marine ecology and palynology; sessions of contributed papers on animal ecology and physiological ecology; and a session on terrestrial and marine communities.

The emphasis of the symposium on marine ecology was on "new approaches." The topics ranged from technical, with D. V. Ellis showing the value of helicopter photography for littoral surveys, to conceptual, with M. J. Dunbar expressing the opinion that high-latitude ecosystems may be more complex than is generally supposed, because of the greater enrichment by infraspecific but ecologically distinct "morphs."

Temperature was a recurrent theme. I. A. McLaren outlined a means of predicting and transforming metabolic effects of temperature. J. L. Chamberlin stressed the importance of exposure time in lethality and possibly in determining distribution boundaries. Dunbar and McLaren, on the other hand, suggested that temperature itself may not impose physiological or evolutionary limits.

The symposium on palynology emphasized statistical methods. It was an all-day symposium, organized by James E. Mosimann, and included five papers. Several new methods of statistical treatment of pollen data were proposed.

Among these methods were the use of ratios of key pollen taxa instead of percentages (L. J. Maher), the measure of absolute numbers of pollen grains deposited per unit time rather than the traditional calculation of percentages of pollen types (M. B. Davis), the comparison of correlation coefficients among pollen types for different pollen diagrams (P. S. Martin), the comparison of the rank order of pollen types for surface samples from different areas (J. G. Ogden), and the use of null models in pollen statistics (J. E. Mosimann). Several of these statistical approaches might make the interpretation of standard pollen counts more reliable or more objective,

but the method of absolute counts, only, provides new basic data not subject to the problems inherent in percentage calculations.

The sessions of contributed papers were diverse in content but reflected in general the continuing contributions which radionuclide tracer studies are making to knowledge of terrestrial (R. C. Pendleton) and aquatic (C. L. Schelske) food chains; the growing interest in ecological problems of various types of pollution (R. E. Warner; R. N. McCauley); and the current emphasis on clarifying structure, function, and development at the level of the ecosystem. These latter studies, which included detailed studies of the productivity of four freshwater marshes (R. A. Jervis), show that these marshes are actually very much more productive in terms of plant material than had been thought previously. Schelske's work with molluscs led to the conclusion that fallout radionuclides accumulated by an organism may be determined by its ecological niche. J. R. Bider described an effective sand strip technique for measuring, by tracks, the activity of animals of many taxa in ground communities of various habitat types. Though laborious, especially on a 24-hour regimen, the quantity of information gleaned justifies the effort, and furthermore, the data may be coded readily and analyzed by computer. Langford and Buell showed that the upland hardwoods vegetation of New Jersey is shifting from oak-forest toward hemlock-northern hardwoods. Diversity and abundance of insects at different trophic levels in grassland communities showed a close relationship to the diversity of vegetation (W. W. Murdoch).

Papers on physiological ecology treated, among other topics, various aspects of water movement and use in the field by pine seedlings (J. R. Clements) and poison ivy (W. C. Ashby); the radiosensitivity of tree seeds (M. B. Heaslip); the significance of root grafting in scarlet oak trees (R. J. Hutnik), and of mycorrhizal nodules in *Podocarpus* (T. E. Furman).

Abstracts of the papers were published in the *Bulletin of the Ecological Society of America*, vol. 45, No. 4, December 1964.

G. M. WOODWELL,
Program Chairman, and
A. N. LANGFORD, *Program Officer*

Science

Geology and Geography (E)

Richard H. Mahard

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