

view as much as did the five persons who took part in the AAAS Symposium on Medical Geology and Geography in Montreal (28 December 1964). Most of the panelists had never met one another until the day of the meeting. Nevertheless, there was virtual agreement on many points.

Helen Cannon showed that not only do soils vary widely in their trace element content, but also that different vegetables vary widely in their trace elements. The same vegetables grown in different parts of one country show significant differences in their mineral content. Anna H. Koffler pointed out that many "old wives'" or "witch doctors'" ideas cannot be ignored. Plants have been used for medicinal purposes for thousands of years. It has been argued that plants contain beneficial drugs. Now it seems, in the light of newer and better chemical techniques, that plants are good for us not only because they contain certain drugs but because they contain these drugs in association with trace elements. Arthur Furst presented evidence suggesting that metals, both essential and nonessential, may play an important role in the cancer processes. R. J. F. H. Pinsent reported that in Great Britain the prevalence of some diseases, notably some cancers, pernicious anaemia, and multiple sclerosis vary widely in different counties. The College of General Practitioners is planning a number of researches in which possible explanations for these variations will be investigated. Mineral imbalances in food and water are one possible explanation which will be considered. Harry V. Warren pointed out that the trace element content of rocks of similar age and type varies greatly. In epidemiological studies, involving trace elements, it proved wasteful in time and money to work with political boundaries. Geochemical and political boundaries seldom have anything in common.

HARRY V. WARREN,
University of British Columbia

Mathematics (A)

Larger than usual audiences attended the two programs of Section A at Montreal (29–30 December 1964).

R. W. Hamming's vice-presidential address on "Computing vs. mathematics" resulted in extensive discussion. His suggestion that numerical analysis differs in many ways from

traditional mathematics stimulated a general consideration of the current revolution in mathematics teaching.

The program of mathematics films attracted an overflow audience. Holbrook MacNeille, in commenting on the varied items, emphasized the experimental approach to the making of the films. He expressed the desire to break away from the direct lecture format if more effective techniques emerge from the current efforts. Techniques shown ranged from an hour-long lecture, including student reaction, by George Polya to films composed entirely by a computer.

WALLACE GIVENS, *Secretary*

Physics (B)

The following is an account of the closely allied programs of the Physics Section (B) and the Canadian Association of Physicists (B4).

Physics Section (B)

The overall program of the Physics Section (B) was a broad, diversified one; it included the allied fields of astronautics and meteorology. Both American and Canadian societies participated at Montreal (28–29 December 1964). This report, however, is restricted to the sessions on physics arranged by the section officers.

The vice-presidential address was given by Ralph A. Sawyer, who recently retired as dean of the Graduate School and vice president for Research of the University of Michigan and is now acting director of the American Institute of Physics. He examined the current crisis in physics education. This crisis starts at the high school level, where the enrollment in physics has stayed constant in absolute numbers while high school enrollments in general have increased many fold. Thus the percentage of students studying physics has declined from about 20 percent in 1900 to 4 percent in 1962. Physics enrollments in the colleges have followed a rather similar pattern in both the United States and Canada and fall far short of promising to meet future needs. Professional opportunities for physicists on the B.S. level have increased drastically since World War II, and the increase has been even greater for those with advanced degrees. The shrinking base of the physics manpower pyramid is re-

stricting the number of Ph.D.'s in physics that are granted, and the needs of the teaching profession and of industrial and government laboratories are going unfilled. This problem is now clearly recognized and is under serious study and attack by the American Institute of Physics, its member societies, and other interested groups. Action programs are underway in the areas of curriculum revision, development of new teaching apparatus, and solution of the staffing problem. Sawyer was optimistic that the impact of these programs will perhaps restore the present lag in physics education, all the way from high school through graduate school.

Following the vice-presidential address, a series of four papers on contemporary topics in physics gave a good sampling of activities in four of the universities of eastern Canada.

STANLEY S. BALLARD, *Secretary*

Canadian Association of Physicists (B4)

The first speaker of invited papers on contemporary physics in Canada was Serge Lapointe (Université de Montréal). He discussed the origin of slow-onset, recurrent magnetic storms. Using the magnetic records of the past 5 years, he was able to use the method of superposed epochs for 38 recorded events to show an association between these magnetic storms and certain radio noise centers on the sun. G. D. Scott (University of Toronto) described experiments on the density of packing of steel balls, and showed that some of the simpler properties of rare gases in liquid and solid forms can be closely reproduced, particularly the ratio of densities of the solid and liquid forms at the triple point. Albéric Boivin (Université Laval) described some new theoretical work on the structure of the electromagnetic field at the focus of a high-aperture, aplanatic lens system, with applications in laser research. He also described some experiments and associated theory on the subject of iterated diffraction by multiple apertures. Finally J. C. Hardy (McGill University) described recent experiments on delayed proton emission, a new form of radioactivity (and incidentally the third to be discovered at McGill out of the existing total of six kinds of radioactivity). These new nuclides extend from carbon-9 to titanium-41,

Science

Physics Section (B)

Stanley S. Ballard

Science **147** (3660), 919.

DOI: 10.1126/science.147.3660.919-a

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