SCIENTIFIC EVENTS

JOHN FILLMORE HAYFORD

AT the annual meeting of the American Geophysical Union, May 1, 1925, the following resolutions were passed:

WHEREAS, we, the members of the American Geophysical Union, have learned with sincere regret of the death on March 10, 1925, of our associate, Dr. John Fillmore Hayford, director of the College of Engineering of Northwestern University; therefore, be it

Resolved, That we express our deep sorrow in the loss of this member whose active work in the American Geophysical Union began with its organization in 1919. He held the office of chairman of the section of geodesy from July 1, 1922, to June 30, 1924, and, not being eligible for immediate reelection, that of vice-chairman from July 1, 1924, until the time of his death.

Dr. Hayford enjoyed world-wide renown in the realm of geophysical science. For a number of years he was in general charge of the geodetic field and office work of the U. S. Coast and Geodetic Survey, during which time he unified the triangulation systems of the entire country by basing them upon a single point and on one spheroid of reference. He derived, from triangulation and astronomical data in the United States, a new spheroid which was adopted in 1924 by the section of geodesy of the International Geodetic and Geophysical Union as being the most reliable in existence and the one recommended for use in all mapping and charting purposes by those countries which have not already adopted a spheroid for such work.

Dr. Hayford, while in charge of the geodetic work of the U. S. Coast and Geodetic Survey, was instrumental in initiating the revision of field and office methods and practices in conducting geodetic work, leading to greater efficiency and economy. He made the first comprehensive quantitative investigation of the theory of isostasy and thereby proved its validity. In recognition of this he was awarded, early in 1924, the Victoria Medal by the Royal Geographical Society of London.

During the war Dr. Hayford was a member of the Advisory Committee on Aeronautics and, at the time of his death, was a research fellow of the Carnegie Institution of Washington, carrying on investigations concerning the levels of water in the Great Lakes.

The long list of scientific reports and papers by Dr. Hayford forms his fitting and lasting memorial.

Resolved, That the members of the American Geophysical Union regret the death of Dr. Hayford as a personal loss as well as a loss to the science of this country and the world and that they express to his family their deepest sympathy.

Resolved, At the annual meeting of the American Geophysical Union, held on May 1, 1925, that a copy of these resolutions be sent to Dr. Hayford's family and that they be spread on the minutes of the union.

THE STRUCTURE OF LIGHT[1]

THE first Fison Memorial Lecture was delivered by Sir Joseph Thomson in the Medical School, Guy's Hospital, London, on Thursday, May 7, the chair being taken by Lord Balfour. Sir Joseph selected as his subject "The Structure of Light," in the course of which he stated that the optical properties of light appear to be explicable only upon a wave theory, whereas the electrical properties are more easily explained on a corpuscular theory. Newton himself really combined the two theories, as the assumption of waves generated by the corpuscles was an essential part of his explanation of simultaneous reflection and refraction. The followers of Newton were "more corpuscular" than Newton himself, and a purely corpuscular theory of light was generally adopted until the work of Young and Fresnel once more focussed attention upon the wave theory. By the end of the nineteenth century, Maxwell's electromagnetic theory, and the pioneer experiments of Hertz and Lodge on electromagnetic waves, had made the wave theory of light probably the most complete and satisfactory in physical science. Then the study of gaseous ionization, the photoelectric effect, X-rays and black body radiation began to throw doubts upon the sufficiency of the ordinary wave theory.

As an alternative, Sir Joseph Thomson put forward a new theory designed to explain both electrical and optical properties of light (see *Phil. Mag.*, vol. 48 (1924), p. 737). Imagine an electron and a positive nucleus joined by a tube of force. If the electron jumps from one stable state to another of smaller energy, we may suppose that the tube of force is thrown into a loop, which becomes detached as a closed "ring of force." Such a ring would travel out like a vortex ring in a direction perpendicular to its own plane. It would also carry with it a definite "quantum" of energy. Immediately before and after the formation of the ring ordinary electromagnetic waves would also be started, but the ring would carry nearly all the energy liberated by the movement of the electron. Absorption of energy by an atom could take place by a converse process, and would normally occur only when the energy in the ring was sufficient to move an electron from one stable state to another, *i.e.*, when the energy was great enough to produce partial or complete ionization of the atom. The circumference of a ring of force would be equal to the wave-length of the light, and so a ring of visible light would be too large to be absorbed easily by an atom except by a process involving resonance, whereas an X-ray ring would be comparable in size to an atom. This would account for the observed differences between X-ray and optical absorption. The waves which

[1] From *Nature*.

accompany the ring would undergo interference and diffraction, and the rings would tend to follow the waves, so that the probability of a ring reaching a given point would depend upon the amplitude of the wave at this point. Thus interference and diffraction fringes would be statistical effects.

SEISMOLOGY IN CANADA

A SIXTH seismograph station, which will assist in the work of those maintained at Saskatoon, Halifax, and Ottawa, by the Dominion Observatory and at Victoria and Toronto by the Meteorological Service, has been established at Ste. Anne de la Pocatière, Quebec, by the Department of the Interior. The new station is situated near the center of the area affected by the earthquake of February 28. The Dominion Observatory does not anticipate any further serious shocks, and the object of the installation is to study better the slight tremors which may occur from time to time in this area as a natural consequence of the more intense quake, as well as to secure a seismological record for this part of Canada.

The major disturbance of February is still under investigation by the seismologist of the Dominion Observatory. In reply to a query in the House of Commons recently, the Honorable Charles Stewart, Minister of the Interior, presented an interim report on the earthquake investigations, which in part was as follows:

The data given in this preliminary report were gathered during a trip of investigation covering the north shore of the St. Lawrence between Quebec and Murray Bay, the south shore from Lévis to Trois Pistoles, and the Lake St. John region as far east as Ha Ha Bay. The two chief objects were the listing of evidence indicating the epicenter, or origin, and an examination into the truth of the reports of damage sustained. The first object has been attained in a tentative way, and the second fairly definitely for the area concerned.

Without going into details it may be said that at present it is thought that the epicenter is in the mountainous region near the eastern boundary of the Laurentides Park. However, that section of the country is practically inaccessible at this season, and data can be better gathered there later, if promised reports from lumbering companies, together with other information already accumulated or still to come should not serve to settle the question definitely.

The fact must be recognized that considerable serious damage was done at several points; on the other hand, many of the reports were exaggerated and some were pure inventions. The damage was not so much a function of the distance from the epicenter as of the nature of the ground and the character of the buildings. The major damages were at Quebec, Shawinigan Falls, Malbaie, St. Urbain and the district near Rivière Quelle. They were in no case widespread or general, and applied in most cases to massive stone structures, without steel reinforcement, such as churches. Minor damages, such as falling of chimneys and breaking of windows, were somewhat more common. As the character of the ground was more rocky or the distance from the epicenter was greater the minor damages were limited to those caused by falling pictures, statues, bottles, etc. Where the damage was relatively serious the ground was found in every case to be sand or clay, usually on the side of a hill.

As in the case of all earthquakes of any considerable intensity, the main shock has been followed by a series of minor ones which are still felt at intervals. Earthquakes have occurred before in this region, the last severe one about half a century ago. Now that the accumulated stresses have, in all probability, been relieved, there is no occasion to anticipate further serious disturbances during the present generation. As an insurance for posterity, however, it would be well to pay some attention to location and methods of construction of new buildings. Where these are massive, and of stone or concrete construction without reinforcement by steel girders, it is preferable to have the foundation on rock or other solid substratum. Wooden or steel reinforced buildings are safe.

THE UNVEILING OF A TABLET IN HONOR OF THOMAS ALVA EDISON[1]

ON the scene where he conceived many of his great inventions and carried on the experiments which resulted in the perfection of his greatest work, at Menlo Park, N. J., a bronze tablet, commemorating these achievements, was unveiled in honor of Thomas Alva Edison on May 16. The tablet was the gift to the State of New Jersey of the Edison Pioneers, men who worked side by side with the inventor in the old days, and it was unveiled by Mrs. Edison, the inventor's wife, while prominent speakers related the tremendous effect his inventions had had upon the progress of mankind.

The inventor himself did not take an active part in the proceedings, but happy as a schoolboy sat on the platform and strained his ear to catch what was being said about him. He heard the affair being broadcast by a process which he had a share in perfecting and posed for the moving pictures which was among his many inventions. The tablet, set in a huge granite boulder with a base of concrete containing bricks from the foundation of the first Edison home in Menlo Park, is on the Lincoln Highway close by the original Edison laboratories and workshops. Participating in the affair were about six hundred of Mr. Edison's friends and former associates, who sat in chairs placed directly on the highway, the traffic over which had been diverted for the occasion. The tablet bears this inscription:

[1] *The Times*, New York.