tionalities were represented by members who took no active part in the scientific program.

At the last meeting, in Stockholm, the congress unanimously voted to accept the invitation of the American Physiological Society and meet in the United States of America in 1929. The Physiological Society invited the Federation of American Societies for Experimental Biology, with which it is affiliated, to share with it the honor of being host to the international congress. At the meeting of the federation at Rochester in April, 1927, the following committee, representing the constituent societies in the federation, was appointed: Professors John J. Abel, Wade H. Brown, Joseph Erlanger, William H. Howell, Reid Hunt, Graham Lusk, J. J. R. Macleod, Lafayette B. Mendel, Phillip A. Shaffer, Torald Sollman, Donald D. Van Slyke, Alfred S. Warthin and Carl Voegtlin. A subcommittee consisting of Professors Frederic S. Lee, Graham Lusk and Dr. Simon Flexner undertook to raise the necessary funds for the congress.

William H. Howell, of the Johns Hopkins University, was chosen president of the congress, Boston was selected as the place to hold the meeting, and Walter B. Cannon, of Harvard University, was appointed chairman of a bureau to have charge of all arrangements. Drs. Edwin J. Cohn and Alfred C. Redfield were appointed the secretaries of the congress. Membership in the congress will be limited to members of the Federation of American Societies for Experimental Biology and to properly accredited scientists from abroad. Other Americans interested in the physiological sciences may attend the scientific sessions as associate members upon introduction by a member of the federation.

The announcements of the congress have been sent to foreign physiologists who have been members of past international congresses or who are members of learned societies interested in the science of physiology. European interest in the congress has been so great that as early as the Harvey celebration in London last May ways and means of coming to America were discussed by the delegates assembled from different European countries. In this connection, Professor A. V. Hill, of University College, London, has arranged to have 300 reservations held on the *SS. Minnekahda,* sailing from London August 9 and from Boulogne August 10. On this voyage the *Minnekahda* will proceed directly to Boston where she is due on Sunday, August 18, the day before the congress opens.

During the week of the congress, members and their families will be lodged in the dormitories of Harvard University, and members from abroad will be the guests of the Federation of American Societies for Experimental Biology. The scientific sessions of the congress will be held at the Medical School of Harvard University.

Following the scientific sessions in Boston, members from abroad and their families will be given an opportunity to visit the Marine Biological Laboratory at Woods Hole. During the following week arrangements will be made for them to visit scientific institutions and other points of interest in and around New York City. A day's excursion will be made to visit Yale University. Throughout this week the foreign physiologists and their families will live in the dormitories of Columbia University as the guests of the federation. The New York visit will be concluded on Saturday morning, August 31, so that members who so desire may sail for European ports on that day.

In that the International Psychological Congress will be held in New Haven from September 1 to 7, physiologists who are also interested in this congress can readily attend it after the visit to New York.

A week's tour is being arranged for members from abroad who desire to spend a short period of time in travel in America. The party will leave New York on Saturday, August 31, and will go by steamer up the Hudson River to Albany, thence by railway to Niagara Falls and Toronto. After visiting the University of Toronto the party will proceed by boat on Lake Ontario and the St. Lawrence River, passing through the Lachine rapids. The trip will terminate at Montreal. While in Montreal, McGill University will extend certain courtesies to those making the trip. It is expected that members of the party will return to Europe by the St. Lawrence route, or certain of them may prefer to return to New York or visit other places in the United States.

It is hoped that the Boston congress will be signalized by just as free an exchange of scientific ideas between physiologists of different nations as has characterized these meetings in the past, and continue to fulfil the aims voiced by Sir Michael Foster in a letter to Professor Kronecker, "to do our best to make it as informal as possible, so that we may freely and without reserve exchange opinions."

THOMAS CHROWDER CHAMBERLIN—TEACHER, ADMINISTRATOR, GEOLOGIST, PHILOSOPHER

IN the passing of Dr. Chamberlin America has lost her greatest geologist and the world one of its boldest thinkers. Since Charles Lyell no one has so greatly changed the fundamental conceptions in earth science. By the force of his intellect he reached unquestioned leadership in philosophical geology, carrying his study of the earth over into celestial physics, and radically

changing the long-accepted theory of the origin and history of the solar system.

Dr. Chamberlin's extended and very successful work as professor, executive and leader in glacial geology has been quite forgotten or overshadowed by the thrilling results of his study in later years. Space here does not allow a fair description of his active life and varied occupation, and the following list of events and dates is a summary.

Born, Mattoon, Ill., September 25, 1843. Died at Chicago, November 15, 1928.
Graduated at Beloit College in 1866.
Principal of Delevan, Wisconsin, High School, 1866–1868.
Married Alma I. Wilson, 1867.
Graduate student at University of Michigan, 1868–1869.
Professor of natural sciences in the Whitewater, Wisconsin, State Normal School, 1869–1873.
Professor of geology in Beloit College, 1873–1882.
Assistant State geologist of Wisconsin, 1873–1876; chief geologist, 1876–1882.
Studied the glaciers of Switzerland in 1878.
In charge of the Glacial Division of the U. S. Geological Survey, 1882–1907.
Professor of geology in Columbian University, 1885–1887.
President, University of Wisconsin, 1887–1892.
Head of the department of geology in the University of Chicago, 1892–1919.
Geologist of the Peary Relief Expedition to Greenland, 1894.
President, Geological Society of America, 1894.
President, Chicago Academy of Sciences, 1898–1914.
President, Illinois Academy of Science, 1907.
President, American Association for the Advancement of Science, 1908.
Research associate, Carnegie Institution of Washington, 1902–1928.
Founded the *Journal of Geology* in 1893, editor-in-chief to 1922, and senior editor, 1922–1928.
Published, "The Geology of Wisconsin," 4 volumes, 1873–1882; with R. D. Salisbury, a treatise on geology in three volumes, 1904–1906; with associates, "The Tidal and Other Problems," 1909; "The Origin of the Earth," 1916; "The Two Solar Families," 1928.
Member of the National Academy of Sciences, the American Academy of Arts and Sciences, the American Philosophical Society and many other scientific societies in this country and abroad.
College degrees: A.B., 1866, and A.M., 1869, from Beloit College; Ph.D., Universities of Michigan and Wisconsin; LL.D., from five universities; D.Sc., Universities of Illinois and Wisconsin.

During thirty years in southern Wisconsin, as student, teacher and geologist, in the region of a splendid display of glacial deposits, it was inevitable that he should become a glacialist. Almost his first papers were three on the "Kettle Moraine," two of them being published in Paris. By the year 1883 he was recognized as the leading American glacialist. Much the larger group of his publications relates to glaciology and the involved branch of climatology. But since about 1900 a large part of his writings relate to solar physics and the geophysical problems involved in a globe of slow growth by infall of cold matter.

Dr. Chamberlin's mind was strongly reflective or philosophic. Except his glacial field-studies and his work for the Wisconsin Survey, few of his writings are largely observational and descriptive. His keen philosophic bent sought for genetic relationships and ultimate causes. The cause of our recent ice-sheets was a sufficiently interesting and difficult problem, but made more difficult and intriguing by the fact of very extensive glaciation in low latitudes of the southern continents, and far back in ancient geologic time; and even more surprising, by the discovery of ice-laid deposits in the most ancient rocks, those of pre-Cambrian time.

The cold climates in most ancient geologic time were positive contradiction of the long-accepted theory of ancient and universal hot climates, as involved in the belief of an original molten globe. This led Dr. Chamberlin in a new quest for the real origin and nature of the terrestrial envelopes, which involved the genesis of the earth itself.

The conception of a molten globe was inevitable under the nebular or Laplacian theory of the solar system. Hence it became necessary to reevaluate the mechanical, physical and mathematical data of the solar family in the light of modern physics and kinetics.

It was a bold and daring adventure to attack a theory of the genesis of the sun and planets which had been universally accepted for more than a century, and was intertexture of all our thinking and almost a part of religion. But Dr. Chamberlin and his associate, Professor F. R. Moulton, in almost a single stroke destroy the old nebular theory. It failed under every test.

It is an interesting illustration of natural conservatism, the hold on thought of long-accepted theory, that with the accumulation in later years of a mass of new principles and exact data in fundamental physics, it should have been left for the geologist to apply the new truth to the origin of the solar system, and to produce a new and acceptable theory.

The astronomers hesitated in accepting the revolutionary conclusion, but to-day if the experts in astronomy do not all accept the planetesimal theory probably no one now holds to the nebular theory. If Dr. Chamberlin's plausible conception is not wholly ap-

proved, and with its geologic implications, certainly the nebular hypothesis is of the past.

Without description of the Chamberlin-Moulton conceptions of the birth of planets and satellites the geologic implications must be briefly considered. Instead of an initial and incandescent globe of full size, surrounded by envelopes of heavy vapors, the planetesimal theory builds the globe by the slow accretion of cold particles (planetesimals). The surface of the slowly growing globe always remained comparatively cold. And when the earth was very much smaller than to-day the physical conditions were similar to those of the present time, with sea and land, storm and sunshine, and perhaps abundant life of lowly forms.

This new theory provides a new foundation, and one much needed, for geologic science. Very few problems in geology can be analyzed without final reference to the origin of the earth, or of its primitive condition. A large part of our geology has been grounded on the conception of a fiery globe, with cooling and solidification of the surface producing the first rocks. In consequence of this universal belief in a once molten earth many problems in geology have remained unsolved and held in suspense. The planetesimal theory greatly helps in the explanation of the fundamental questions in earth science. (See SCIENCE, Vol. 64, pp. 365–371, Oct. 15, 1926.) It is not surprising that some geologists are so committed by their thinking, teaching and writing to the idea of a superheated and liquid earth that they fear cold and solidity. And the new theory was developed west of the Hudson River!

Dr. Chamberlin's work was original and constructive, although to erect his greatest structure he had to destroy an old one. Many of his conclusions in geology are collected in the three-volume treatise, Chamberlin and Salisbury's "Geology," 1904–1906, which remains the most suggestive and authoritative American text-book.

Dr. Chamberlin's absorbing interest in science is shown by his leaving the attractive duties and honors in the presidency of a great state university in order to build a strong department of geology, and have opportunity to devote the years of his maturity to teaching and study.

He was a man of large and handsome physique. With a sensitive nature, he was somewhat reserved and properly dignified, yet urbane and affable. His honors were mostly from the institutions in the area of his life work and from those who knew him best. He was a seer honored in his own country.

The great personal influence of Dr. Chamberlin is perpetuated through the legion of successful and eminent men who found inspiration and training in the great school of geology that he founded and conducted with the efficient assistance of a corps of able associates. Among them were R. D. Salisbury, R. A. F. Penrose, J. P. Iddings, S. W. Williston and Stuart Weller. As time went on, a number of younger men were added to the staff, including his son, R. T. Chamberlin, who keeps the honored name identified with the science of geology.

H. L. FAIRCHILD

UNIVERSITY OF ROCHESTER

SCIENTIFIC EVENTS

THE FIFTH INTERNATIONAL BOTANICAL CONGRESS, CAMBRIDGE, 1930

AT the Fourth International Botanical Congress held at Ithaca, N. Y., in 1926, an invitation from British botanists to hold the next International Botanical Congress in England was accepted. It has since been decided that the Fifth International Congress shall be held at Cambridge from August 16 to 23, 1930, with excursions during the following week.

An executive committee of British botanists has been appointed to make the necessary arrangements for the congress. The members of this executive committee are Dr. F. F. Blackman, Professor V. H. Blackman, Dr. E. J. Butler, Professor Sir John Farmer, Professor F. E. Fritsch, Professor Dame Helen Gwynne-Vaughan, Dr. A. W. Hill, Professor Neilson Jones, Sir David Prain, Dr. A. B. Rendle (treasurer), Professor A. C. Seward (chairman), Professor W. Stiles, Professor A. G. Tansley, together with Mr. F. T. Brooks and Dr. T. F. Chipp (secretaries).

The subscription for membership of the congress will be one pound (£1), which should be paid to the treasurer, Dr. A. B. Rendle, British Museum (Natural History), London, S. W. 7. Early notification to the treasurer of intention to attend the congress is particularly requested.

As at present arranged the congress will be organized in the following sections: Paleobotany, Morphology (including Anatomy), Taxonomy and Nomenclature, Plant Geography and Ecology, Genetics and Cytology, Plant Physiology, Mycology and Plant Pathology.

For each of these sections a British subcommittee has been appointed, by which the program for each section will be arranged. The chairmen of these subcommittees and their addresses are as follows:

PALEOBOTANY: Professor A. C. Seward, Botany School, Cambridge.