the most difficult problems. His first theoretical papers on the Trojan Group were later followed by a general theory, applicable to all planets of this group, and especially to the more difficult ones having a large amplitude of libration. The study of the motion of the eighth satellite of Jupiter is an example of his preference for difficult problems.

Gradually Brown became actively interested in the more general problems present in the development of theories of planetary motion. His contributions to the theory of resonance were part of these investigations. He also laid the foundation for the construction of the "Tables for the Development of the Disturbing Function" (1933). Most of his contributions in this field were collected in a coherent presentation in the treatise "Planetary Theory" (1933), written in collaboration with Professor C. A. Shook.

During the last three years of his life the "main problem" of the lunar theory had his attention again. This led to several separate investigations of considerable importance. The most noteworthy of these is the treatment of the stellar problem of three bodies. His analysis of this problem showed again his ability to adapt available methods to the treatment of the special problem before him.

At the very early age of thirty-one he was elected fellow of the Royal Society of England. This was the beginning of a long sequence of honors that continued throughout his life.

In 1891 Brown came to the United States to become instructor of mathematics in Haverford College. Two years later he was promoted to the rank of professor. He remained at Haverford until 1907, when he became professor of mathematics in Yale University. He served Yale until his retirement in 1932. The appointment at Yale came when the lunar theory was nearly completed, and the construction of the tables loomed as the next phase of the work. Arrangements were then made by which Yale University undertook the cost of their calculation, printing and publication.

In earlier years Brown taught various subjects in pure and applied mathematics; in later years his only courses were elementary and advanced dynamics and celestial mechanics. Many of his students kept in touch with him in later years, and some became lifelong friends.

His relations with Yale Observatory, which were entirely unofficial with the exception of a period during which he was acting director, were mutually beneficial.

He was an active member of the American Mathematical Society, was editor of the *Transactions* and of the *Bulletin* for a number of years and president for two years, 1914–16. Of the American Astronomical Society he was president for three years, 1928–31. Since 1911 he was associate editor of the *Astronomical Journal*.

He was born in Hull, England, on November 29, 1866, and died in New Haven, Connecticut, on July 22, 1938. He was unmarried.

DIRK BROUWER
YALE UNIVERSITY OBSERVATORY

WILLIS RAY GREGG

DR. WILLIS RAY GREGG, late chief of the U. S. Weather Bureau, died in the Blackstone Hotel, Chicago, on Wednesday evening, September 14, 1938, where he had been attending an aviation conference between the Civil Aeronautics Authority and the Air Transport Association of America and where he was stricken with coronary thrombosis on the afternoon of Wednesday, September 7. Dr. Gregg, a descendant of James Gregg, who went from Ayrshire, Scotland, to Ireland in 1690, and thence to America in 1718, was born on January 4, 1880, at Phoenix, N. Y., where he grew up on a farm.

His formal education, attested by a B.A. degree in 1903, was obtained at Cornell University. An honorary Sc.D. was awarded to him in 1937 by Norwich University. On March 1, 1904, he entered the Weather Bureau as an assistant observer at Grand Rapids, Michigan. After a service of nearly three years, first at this station and later at Cheyenne, Wyoming, he was transferred to the Bureau's research observatory at Mount Weather, Va., on the crest of the Blue Ridge, 45 miles from Washington. Here for seven years he made important studies of the upper air—a line of investigation with kites and balloons that then was rapidly developing in many countries owing largely to the aid the knowledge thus obtained of winds and weather was to the whole art and practice of aviation. In November, 1914, he was called to Washington as assistant chief of the section of aerology, a section that soon became a division. In 1917 he was made chief of this important division, in which capacity his counsel and active aid frequently were requested by other agencies of the government and by civilian organizations, and always freely given whatever the sacrifice of time and effort on his part.

This wide experience, together with his profound sense of justice, untiring industry, even temper and cheerful optimism, well fitted him for the important position of chief of the Weather Bureau, to which he was appointed on January 31, 1934. This was a high honor, richly deserved, but it carried with it responsibilities, burdens and worries—worries about meeting rapidly increasing demands with a nearly stationary personnel.

Owing to his pleasing personality, ability and willingness Dr. Gregg's services were sought for in many

lines. He was active as a Mason and was a past master of his lodge; in his church he sang in the choir and was a vestryman; in science he was a member of the National Advisory Committee for Aeronautics (chairman of the executive committee and of the subcommittee on meteorological problems), International Meteorological Organization, International Meteorological Committee, the Guggenheim Committee on Aeronautical Meteorology and of several other organizations and committees of like nature, including the Royal Meteorological Society and the American Meteorological Society (treasurer, 1923–1935, president, 1938). He also was a member of the Washington Philosophical Society (treasurer, 1921), Washington Academy of Sciences, American Geophysical Union (chairman of the section on meteorology, 1932–1935) and fellow of the American Association for the Advancement of Science. He was a member and frequenter of the Cosmos Club, in which he had many close friends.

In addition to technical articles, he wrote also the monograph, "Aerological Survey of the United States," 1922 and 1926, and "Aeronautical Meteorology," 1925, second edition, 1930.

On October 15, 1914, he married Mary Chamberlayne Wall, daughter of an Episcopal minister of Berryville, Va. He is survived by his wife, one daughter, Ruth Marguerite, a brother and three sisters.

W. J. HUMPHREYS

RECENT DEATHS AND MEMORIALS

ARTHUR HERMAN ADAMS, a consulting engineer of New York City, died on September 25 at the age of fifty-nine years.

THE REV. WALTER G. SUMMERS, head of the department of psychology at Fordham University, died on September 24 at the age of forty-nine years.

DR. ARTHUR STANLEY MACKENZIE, from 1911 to 1931 president of Dalhousie University, died on October 2 at the age of seventy-three years. From 1891 to 1905 Dr. Mackenzie was professor of physics at Bryn Mawr College and was later for a short time head of the department of physics at Stevens Institute of Technology.

DR. A. ROSENTHAL, a neurologist of Jerusalem, was killed on September 14 when passing through Ramleh, where vehicles were being stoned.

DR. VOLKMAR KOHLSCHÜTTER, since 1909 professor of inorganic and physical chemistry at the University of Bern, died on September 10 at the age of sixty-five years.

Nature reports that the Dutch Medical Association, the Leyden Faculty of Medicine and the Society of the History of Natural Sciences of Leyden organized a celebration beginning on September 23 to commemorate the two hundredth anniversary of the death of Herman Boerhaave. Visits were paid to the old St. Cecilia Hospital, where Boerhaave gave clinical lectures, his country house "Poelgeest" near Leyden and the village of Hardewyk on the Zuyder Zee, the seat of the university where Boerhaave presented his inaugural thesis on July 15, 1693. It is planned to publish a commemoration volume.

SCIENTIFIC EVENTS

THE STANDARDIZATION WORK IN PHOTOGRAPHY

FOLLOWING a request from the International Standards Association that the United States take leadership in standardization work in the field of photography, the Standards Council of the American Standards Association meeting in New York approved the undertaking. A new committee will be organized representing manufacturers, distributors and users of photographic materials in the United States. Its duties will be: (1) To initiate an American Standards Association project on standardization in the field of photography under the leadership of the Optical Society of America; (2) to take leadership in the international project on photography as well as cooperating in the work.

The work to be undertaken will include formulation of definitions, dimensional standards and recommended practices in the field of photography; and the establishment of methods for testing, rating and classifying the performance characteristics of materials and devices used in photography, including its industrial applications, but excluding cinematography.

Part of the work of the committee will consist in collecting and codifying what has already been done in the above fields. For instance, efforts have already been made to set up logical and systematic nomenclature in small sections of the photographic field. Considerable progress has also been made by manufacturers of sensitive materials and photographic equipment in establishing definite dimensional standards for materials and appliances. The role of the new committee in these cases will be to bring such manufacturers together and obtain agreement so that greater interchangeability may be achieved.

A detailed outline of photographic problems for the new committee's consideration was read and approved. While some of these are probably not at the present