

# REPORT OF THE NATIONAL ACADEMY OF SCIENCES

FOR THE YEAR

1914



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1915

Thomson, Trelease, Van Hise, Walcott, Webster, Welch, Wheeler (W. M.), White, Wilson, Woodward.

The president announced the death, since the last annual meeting, of the following members:

Silas Weir Mitchell, January 4, 1914. Elected 1865.

Seth Carlo Chandler, January 10, 1914. Elected 1888.

Benjamin Osgood Peirce, January 14, 1914. Elected 1906.

Edward Singleton Holden, March 16, 1914. Elected 1885.

George William Hill, April 16, 1914. Elected 1874.

Charles Santiago Sanders Peirce, April 22, 1914. Elected 1876.

And foreign associates:

Karl Harry Ferdinand Rosenbusch, January 14, 1914. Elected 1904.

Sir David Gill, January 24, 1914. Elected 1898.

Sir John Murray, March 16, 1914. Elected 1912.

## REPORTS OF THE PRESIDENT AND THE TREASURER.

The reports of the president<sup>1</sup> and of the treasurer<sup>2</sup> for 1913, as transmitted to the Senate of the United States by the president of the academy, were presented in their printed form and approved.

## SPECIAL COMMISSION ON THE FUR SEAL.

The president reported that a request had been received from the President of the United States that a member of the academy be nominated to serve as a member of a special commission to visit the Pribilof Islands during the summer of 1914 for the purpose of advising the Government regarding the condition of the fur-seal herd and of making recommendations concerning the policy which should be adopted with reference thereto.

Following is the communication from the President of the United States:

THE WHITE HOUSE,  
Washington, February 20, 1914.

MY DEAR DR. WELCH: You are respectfully requested to nominate a member of the National Academy of Sciences properly qualified to study the economic and scientific questions involved in the administration of the fur-seal herd, but not hitherto identified in any way with the fur-seal controversy, to go to the Pribilof Islands in the season of 1914 as a member of the special commission hereinafter mentioned.

The Secretary of Agriculture and the Secretary of the Smithsonian Institution have each been asked to designate a member of this special commission. The three persons named constituting the commission will be asked to make a practical investigation of the present condition of the seal herd and submit a full report to the Secretary of Commerce, with recommendations, not later than December 31, 1914.

The subjects for special determination will be:

1. The numerical strength of various components of the herd.

<sup>1</sup> Report of the National Academy of Sciences for the year 1913, pp. 9-31.

<sup>2</sup> Idem, pp. 31-39.

## BENJAMIN OSGOOD PEIRCE.

Benjamin Osgood Peirce was born in Beverly, Mass., February 11, 1854. At the age of 9, Peirce took a voyage with his parents to the Cape of Good Hope, where his extraordinary power of observation aided by a retentive memory, left a record so vivid that 50 years afterwards he was able to surprise South Africans by his accurate descriptions of conditions there. He was educated in the public schools of Beverly, Mass., and in the two following years, during which he also learned the carpenter's trade, he prepared himself for Harvard. At Harvard he took a well-selected course, but showed such a marked talent for mathematics and physics that on graduation in 1876 he received a traveling fellowship and proceeded to Germany for further study, remaining there for four years. In 1879 he obtained the degree of Ph. D. at Leipzig, where he had worked in Wiedemann's physical laboratory, and the next year he spent under Helmholtz in Berlin. Returning to the United States in 1880, and after teaching a year at the Boston Latin School, Peirce was appointed instructor in mathematics at Harvard, and was promoted in 1884 to an assistant professorship. In 1888 he received the appointment to the Hollis professorship of mathematics and natural philosophy, which perhaps gave him a freer hand and enabled him to distribute his time as he preferred in the laboratory and in mathematical physics. His courses in the latter subject were worked up to a high degree of efficiency, this subject being entirely new in this country at that time. In the laboratory, in a similarly painstaking manner, he developed an admirable course in electrical measurements. Peirce was a voracious reader, particularly of biography and history, spoke French well, and German, even including the South German dialect, so well as to deceive the native. He had a passion for music, and possessed an excellent knowledge of musical form and history. Painting and architecture also he keenly enjoyed, delighting particularly in the Gothic forms. He kept a font of type in the laboratory, and set up many of the complicated mathematical formulæ in one of his books with his own hand, while his figures were always drawn by himself, and the curves carefully made by templets filed out in sheet metal. In 1900, too strict attention to work brought on nervous prostration and two years' leave of absence, after which, even though health had not returned, Peirce never lost a lecture. President Lowell, in conferring the degree of doctor of science upon Peirce, called him "a scientist ignorant only of his own deserts." He was a member of the National Academy of Sciences, the American Mathematical Society, the American Physical Society, the Astronomical and Astrophysical Society of America, the Société Française de Physique, the Circolo Matematico di Palermo, a fellow of the American Academy of Arts and Sciences, and of the American Philosophical Society.

Among his published works are *Theory of the Newtonian Potential Function*, *Table of Integrals*, and *Experiments in Magnetism*.

Prof. Peirce died on January 14, 1914, lacking but a few days of 60 years of age.

(Extract from the paper by Arthur Gordon Webster in the *Nation*, vol. 98, no. 2547.)

## EDWARD SINGLETON HOLDEN.

Edward Singleton Holden was born on November 5, 1846, and died on March 16, 1914. He received the degree of B. S. at Washington University (St. Louis) in 1866 and graduated from the United States Military Academy in 1870. In 1879 Washington University conferred upon him the degree of A. M., and in 1887 Wisconsin conferred the degree of LL. D., followed by Columbia conferring the same degree in 1888. Two other honorary degrees came to him—that of Sc. D. from Pacific University and doctor of letters from Fordham University in 1910. He was lieutenant of Artillery in the United States Army in 1870 to 1871; lieutenant of Engineers from 1871 to 1873; professor of mathematics in the United States Navy from 1873 to 1882; director of Washburn Observatory from 1881 to 1885; president of the University of California from 1885 to 1888, and director of the Lick Observatory from 1885 to 1897. From 1901 he was the librarian of the United States Military Academy. Among the foreign orders he received Knight Commander Ernestine Order, Saxony, 1894, Order of Bolivar, 1896, Knight Royal Order of Danebrog, Denmark, 1895. His membership in societies included the National Academy of Sciences, to which he was elected in 1885, the American Philosophical Society, fellow of the American Academy, associate of the Royal Astronomical Society, Société Astronomique de France and of the Società degli Spettroscopisti Italiani.

His appointment to Lick Observatory was the beginning of his studies of the physical constitution of the sun and its surroundings, and the planetary markings of the surfaces of such minute disks as those of Jupiter's satellites or the planet Uranus also engaged his attention. The helical forms of nebulae were the subject of intimate study. His 12 years' direction in the Lick Observatory from 1885 to 1897 resulted in the accomplishment of much useful work, and it was with the resignation of the position of director of the Lick Observatory that his scientific activities apparently ceased.

## GEORGE WILLIAM HILL.

George William Hill was born in New York City on March 3, 1838, and died at West Nyack, N. Y., on April 16, 1914. He graduated from Rutgers College in 1859, and almost immediately after graduation he accepted a position in the Nautical Almanac Office, then at

discuss it when others desired him to do so. He seemed altogether indifferent to his reputation with all except a few authorities, and he knew he did not need to give any thought regarding his reputation with them. As he never married, he had neither the satisfaction nor the distraction which a family brings. He was, in short, a man of exceptional abilities who found keen pleasure in devoting a long and serene life to the pursuits of science, and in his death America loses one of her most original and profound men.

(Prepared by F. R. Moulton.)

#### CHARLES SANTIAGO SANDERS PEIRCE.

Charles S. Peirce, as his name was more commonly written, was born on September 20, 1839, at Cambridge, Mass., and died April 20, 1914, at Milford, Pa. He was a logician, a mathematician, and a philosopher. He graduated from Harvard in 1859, and for a number of years was connected with the United States Coast and Geodetic Survey. Later he lectured on logic at Harvard University, Johns Hopkins University, and the Lowell Institute, and it was in this subject that most of his original work was done. His paper on the algebra of logic and on the logic of relatives, being pioneer work, gave him an international reputation. Probably his most conspicuous contribution to the philosophical thought of the time was the idea of pragmatism; afterwards developed and modified by William James. In 1887 he retired to Pike County, Pa., to devote himself completely to logic. Mr. Peirce was a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences. He was the author of Photometric Researches, and of numerous articles upon logic, history of science, metaphysics, psychology, mathematics, gravitation, astronomy, map projections, color sense, chemistry, and on the cataloguing of libraries. He contributed a large portion of the scientific definitions to the Century Dictionary and some of the chief articles on logic to Baldwin's Dictionary of Psychology and Philosophy.

(Extract from the Nation, vol. 98, no. 2547.)

#### THEODORE NICHOLAS GILL.

Theodore Nicholas Gill was born in New York City on March 21, 1837. At an early age he developed an interest in natural science, and during the winter of 1857-58 visited Barbados, Trinidad, and other West Indian Islands in the interest of Mr. D. Jackson Stewart, for whom he collected shells and various natural history specimens. The results of these explorations were published in the Annals of the New York Lyceum of Natural History, and in the Proceedings of the Philadelphia Academy of Natural Sciences. It was in the library of the Philadelphia Academy that he laid the foundation of that great

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