

OBITUARY.

PLINY EARLE CHASE.

PLINY EARLE CHASE, a distinguished member of the FRANKLIN INSTITUTE, and acting President of Haverford College, died on Friday, December 17, 1886, at his home on the college grounds. PLINY EARLE CHASE, the oldest son of Anthony and Lydia Earle Chase, was born at Worcester, Mass., August 18, 1820, and consequently, at the time of his death, was in his sixty-seventh year. He was graduated at Harvard College in 1839, and for some time thereafter devoted himself to teaching. His first engagement in this career was as the principal of a district school in Leicester, Mass.; subsequently he was appointed to the principalship of a school in Worcester. He came to Philadelphia, which was destined to be his future home, in 1841, and engaged in the same avocation; first, in the Friends' select school, and later in a private school of his own. On account of impaired health, he abandoned teaching in 1848, and was engaged in mercantile pursuits for some ten or twelve years. During this period, he carried on the stove and foundry business, under the firm names of North, Harrison & Co., North, Harrison & Chase, North, Chase & North, and Chase, Sharp & Thompson, the late John Edgar Thompson, President of the Pennsylvania Railroad Company, being a silent partner in the last-named firm.

In 1861, he again returned to teaching, succeeding the late Prof. C. D. Cleveland in the ownership of a prominent school for young ladies, at 903 Clinton Street, in Philadelphia.

In 1871, he received the appointment of Professor of Natural Science in Haverford College. He was afterwards transferred to the Chair of Philosophy and Logic, and at the time of his death, and for nearly a year prior thereto, he was the acting President of that institution. He also occupied temporarily the post of Professor in the University of Pennsylvania, made vacant by the death of Prof. John F. Frazer; and that of Lecturer on Psychology and Logic in Bryn Mawr College.

PROF. CHASE'S relations with the INSTITUTE date from 1851, in which year he became a member. He was elected a member

of the Board of Managers in 1864, and of the Committee on Publications in 1869, and served continuously in both offices until his death. He was frequently called upon to assist in the work of instruction, and his name appears on a number of the annual programmes as a lecturer, upon subjects relating, principally, to astronomy and meteorology. For a number of years, also, he prepared the scientific notes which have added much to the general interest of the JOURNAL, to which he was likewise an occasional contributor.

PROF. CHASE devoted much time to philosophical, philological and physical studies, and was esteemed universally as a scholar of extraordinary versatility, and as an original thinker of the highest order. The thoroughness and extent of his scientific work are shown by his numerous published writings, which include about 120 titles in the register of papers published in the *Transactions and Proceedings of the American Philosophical Society*; about fifteen articles in other periodicals, principally the *American Journal of Science* and the JOURNAL OF THE FRANKLIN INSTITUTE, and several small independent works, the last of which is his *Treatise on Meteorology*. This extensive list of publications bears evidence of the intense mental activity of his life. In the beginning, and occasionally all through the list of publications, we see his interest in the mysteries of the origin of language; his studies in Sanskrit, Chinese and Indo-European roots and analogues, were followed by a Copto-Egyptian vocabulary; but with slight exceptions, all of his works since those first years have been confined to problems in Cosmic, Terrestrial and Molecular Physics. In these departments, it has been not so much observation and experiment, but rather the search after theoretical relations and the deductive establishment of new principles that has chained his attention. It would seem as though to his mind the operations of Nature were conducted by the same laws, whether on the smallest or on the largest scale. Thus, from the motions in a small mass of resisting material, he deduced the sun's mass and distance; from the cosmic relations of gravitation and inertia in the solar system, he deduced the velocity of light; by studying the loci of planetary aggregation under the perturbing influence of Neptune and Jupiter on the asteroids, he predicted the location of an unknown planet.

In meteorology, his work includes the distribution of heat and barometric pressure; the polarization of sky-light; the periodicity in rainfall at Philadelphia and over the world; the effect of cosmic influences on meteorology; the relation of the aurora to rainfall; the laws of cyclonic and anti-cyclonic movements. In his meteorology, he has brought together a number of the more recent results of studies, especially those bearing on the local indications and general predictions of the weather, and, we are informed, has educated his scholars in a method of weather prediction based upon his tidal and harmonic tables. Unfortunately, however, these methods of prediction have in them too much that is empirical to justify their adoption by ordinary meteorologists. To the general reader his works undoubtedly seem imbued with the spirit of Kepler, and with his patience also, who toiled through innumerable speculative computations to eventually fall, most fortunately, upon the three laws that served Sir Isaac Newton as tests of the truth of his own brilliant inductions.

The general impression which the work of PROF. CHASE has made upon his scientific contemporaries is perhaps fairly expressed in the following abstract from a letter received by the Committee from a scientific man of eminent position and reputation, to whom the Committee had applied for data to aid in the preparation of the foregoing inadequate memorial:

"I comply with your request to contribute a few words upon CHASE's scientific contributions, although I am no more worthy to pass judgment upon them than are the others to whom you have applied. I should be glad to examine his works in detail, more thoroughly, but their enormous extent utterly forbids my attempting it. I have in years past frequently read them with amazement, not understanding at all the logical process by which he arrived at his conclusions, many of which, however, served to confirm a principle recognized by mathematicians, namely, that a given law expressed in one set of terms will be found to be applicable to one class of natural phenomena, while the same law or equation will apply to another class of phenomena, if we merely attribute new and appropriate interpretations to the constants or data entering into the equation. On this principle Drummond, of late years, has developed his work on natural law in the spiritual world, and this seems to be the fruitful idea that pervaded the whole of PROF. CHASE's publications."

In 1864, the American Philosophical Society, of which PROF. CHASE was one of the most active members, awarded him the "Magellanic Gold Medal," for his paper on "The Numerical Relations of Gravity and Magnetism."

In character, PROF. CHASE was one of the most lovable of men, and the following tribute to his memory from a brother professor will be warmly endorsed by all who knew him well:

"With the widest attainments in the field of knowledge, he preserved the greatest simplicity and humility. He was always ready to hear, and weigh fairly the opinions of others; and, when necessary to maintain his own, it was always done with modesty, courtesy and kindness. Retiring in his disposition, it was often difficult to draw forth an opinion from him. He was a member of the Society of Friends, and a thorough believer in its principles. The simplicity of his Christian faith and the beauty of his life must long be remembered by his friends." THE COMMITTEE ON PUBLICATIONS.

BOOK NOTICES.

THE SEPARATE SYSTEM OF SEWERAGE. By Cady Staley and Geo. S. Pierson, C. E. New York: D. Van Nostrand.

The authors of this work commence by calling attention to the imperative need of some system of sewerage as soon as population becomes aggregated within a limited area, the existing conditions being forcibly stated in the following passage: "An examination into the sanitary condition of a majority of our older cities and villages will show the great need of some kind of sewerage. Many of them have never taken any measures to rid themselves of the necessary accumulations of filth incident to a considerable population. For generation after generation, the refuse which should be removed from the dwellings, has been flung upon the surface of the ground, or into cess-pools, where the putrefying mass poisons the air and appeals in more ways than one for a remedy."

After pointing out the evils of the Combined System, the advantages of the Separate System are explained, and numerous tables are given, showing the rate of flow of liquids through pipes, etc., which indicate the scientific knowledge requisite to properly remove the liquid wastes from a given area.

The applicability of the Separate System is set forth as follows: "The introduction of the Separate System marks an important era in the development of sanitary drainage, recognizing, as no other system has, the prime importance of an early removal of household and industrial wastes, which are the main factors in soil pollution. That it will best meet the requirements of all large and densely populated cities (economy considered), is not probable. That, under competent advice, it can meet the requirements of *houses*