THOMAS STERRY HUNT.

In that most delightful essay entitled "American Contributions to Chemistry," delivered by the younger Silliman at the Centennial of Chemistry, held in Northumberland, Pa., in July and August, 1874, are the following words referring specifically to the eminent scientist whose death has so recently occurred. It says:

"The name of no American chemist occurs more frequently, or in a more important relation to the progress and development of our science, during the past quarter of a century than that of Dr. Hunt. His contributions to our science have been equally valuable in theoretical chemistry, in chemical philosophy, and in geological and mineralogical chemistry."

He was descended from an old New England family, and was born in Norwich, Conn., on September 5, 1826. His father, Peleg Hunt, was a descendant of William Hunt, who, in 1635, was one of the founders of Concord, Mass., and an ancestor of William M. Hunt, the well known architect; while on the maternal side, his grandfather was Consider Sterry, a distinguished mathematician and civil engineer, who, in 1790, published. in connection with his brother, Rev. John Sterry, a Baptist divine, a treatise on arithmetic, and later one on algebra.

His early education was acquired in Norwich, and he was destined for the medical profession by his parents, but, attracted to New Haven by the fame of the scientific development there in progress under the elder Silliman, he began the study of chemistry there, and was closely associated with the younger Silliman. For two years he continued his studies, serving part of the time as assistant in the laboratory of Yale College, and was offered the appointment of chemical assistant to the then newly established school of agricultural chemistry in Edinburgh. This, however, he declined, and in 1847 accepted the post of chemist and mineralogist to the Geological Survey of Canada, under Sir William E. Logan, which place he then held for twenty-five years. Meanwhile he also occupied the chair of chemistry in Laval University, Quebec, from 1856 till 1862, delivering the lectures there in French, and thereafter, till 1868, he filled a similar appointment to McGill University, in Montreal.

In 1872 he returned to the United States, and accepted the chair of geology in the Massachusetts Institute of Technology, made vacant by the resignation of William B. Rogers. This appointment he held until 1878, since when he devoted his attention chiefly to expert work and literary pursuits.

From these bare facts of biographical detail we turn to a necessarily brief consideration of his life work. As early as 1847 he began the contribution of a series of papers on theoretical chemistry to the *American Journal of Science*, which, originating in a review of some of the ideas put forth by Charles F. Gerhardt, led to his advancing and advocating those views, largely original with himself, which are now accepted as fundamental in our present system of chemistry. He developed a system of organic chemistry that was essentially his own, in which all chemical compounds were shown to be formed on simple types represented by one or more molecules of water or hydrogen. Dr. Wolcott Gibbs has said, to Dr. Hunt "is exclusively due the credit of having first applied the theory to the so-called oxygen acids and to the anhydrids, and in whose earlier papers may be found the germs of most of the ideas on classification usually attributed to Gerhardt and his school." An account of the growth of this branch of chemistry will be found in his paper read at the Centennial of Chemistry held in 1874, entitled "A Century's Progress in Chemical Theory."

His researches on the equivalent volumes of liquids and solids were a remarkable anticipation of those of the great French chemist Dumas, while in his "Introduction to Organic Chemistry," published in 1852 with Silliman's "First Principles of Chemistry," he was the first to define that branch as "the chemistry of carbon and its compounds." His studies of the polymerism of mineral species, as set forth in his paper on "Objects and Methods of Mineralogy," opened a new field for mineralogy, but these philosophical studies were only incidental to his labors in chemical mineralogy and chemical geology.

His researches into the chemical and mineral composition of rocks were probably more extended than those of any contemporary scientist. From his long series of investigations of the lime and magnesia salts he was enabled to explain for the first time the relations of gypsums and dolomites, and to explain the origin of the latter by direct deposition. The first systematic attempt to subdivide and classify geologically the stratiform crystalline rocks was made by him. The names Laurentian and Huronian, applied to the earliest known rocks on this continent, were given by him to two subdivisions of the Azoic period. Likewise the distinctions and designations of Norian, Montalban, Taconian, and Keweenian were originated by him and have gained an acceptance in the literature of geology. In connection with these studies he attempted the discussion of the great questions of the origin and the succession of these rocks.

He sought to harmonize the facts of dynamical geology with the theory of a solid globe, and after reviewing and controverting various hypotheses, including the igneous or plutonic, the metamorphic, and the metasomatic, all of which he rejected as irreconcilable with observed facts and as isolating chemical theory, thus showing the essential correctness of the still imperfect Wernerian aqueous view, he advanced the so-called crenitic hypothesis, in which he argued that the source of the various groups of crystalline rocks was the original superficial portion of the globe, once in a state of igneous fusion, but previously solidified from the center. This portion, rendered porous by cooling, was permeated by circulating water, which dissolved and brought to the surface during successive ages, after the manner of modern mineral springs, the elements of the various systems of crystalline rocks. These views were originally advanced in his essay on the "Chemistry of the Earth," which was published in the "Report of the Smithsonian Institution" for 1869.

His conclusions on many points of geology are embodied in his retiring address as president of the American Association for the Advancement of Science, at Indianapolis, in 1871, and in a matured form in his "Mineral Physiology and Physiography," originally published in Boston in 1886, in which may be found his theories of the origin, development, and decay of crystalline rocks set forth in detail.

Dr. Hunt was the first to make known the deposits of phosphate of lime in Canada, and to call attention to their commercial value for fertilizing purposes. The chemical and geological relations of petroleum were studied by him, and the salt deposits of Ontario were investigated by him. His researches in the chemistry of mineral waters were exhaustive, and were said to have been "more extended than those of any other living chemist." Reports and papers on these subjects by him appeared in the various volumes issued by the Geological Survey of Canada.

In 1859 he invented and patented the permanent green ink which has since been so extensively used and gave the name of "greenback" currency to the bills which were printed with it. Later he was associated with James Douglass, Jr., in the invention of a wet process for the extraction of copper from low grades of ores, consisting essentially of roasting the ore, bringing it into solution, and then precipitating the copper in its metallic form by the introduction of iron.

He was the author of more than two hundred separate papers that appeared in the transactions of various learned societies and scientific periodicals. Besides the reports of the Geological Survey of Canada, he published in book form "Chemical and Geological Essays" (Boston, 1874, 4th ed. New York, 1891); "Azoic Rocks," being Report E of the Second Geological Survey of Pennsylvania (Philadelphia, 1878); "Mineral Physiology and Physiography" (Boston, 1886, 2d ed. New York, 1890); "A New Basis for Chemistry" (Boston, 1887, 3d ed. New York, 1890). This also appeared as "The Nouveau Système Chimique" (Paris, 1889), and a Russian translation, being the initial volume of a series of foreign scientific classics, was announced for the present year. His last work, entitled "Systematic Mineralogy According to a Natural System," was published in New York during 1891.

Dr. Hunt was a popular speaker on scientific subjects, and delivered two courses of lectures before the Lowell Institute, in Boston. He served on juries at the World's Fair held in Paris in 1855 and in 1867, being made an officer of the Legion of Honor on the latter occasion, and was also one of the judges at the World's Fair held in Philadelphia in 1876. The honorary degree of A.M. was conferred on him by Harvard in 1852, that of LL.D. by McGill in 1857, that of Sc.D. by Laval in 1858, and that of LL.D. by Cambridge, England, in 1881. Also he was an officer of the Italian Order of St. Mauritius and St. Lazarus.

He was president of the American Association for the Advancement of Science in 1870 and of the American Institute of Mining Engineers in 1877. The American Chemical Society called him to its presidency in 1880, and again in 1888. He was one of the founders, and the first president by election, of the Royal Society of Canada in 1884. In 1876 he organized, in concert with American and European geologists, the International Geological Congress, was its first secretary, and vice-president at its meetings held in Paris in 1878, in Bologna, Italy, in 1881, and in London in 1888.

In 1859 he was elected a fellow of the Royal Society of London, and in 1873 he was chosen to the National Academy of Sciences. He was a member of the American Philosophical Society, the American Academy of Arts and Sciences, and abroad of the geological societies of France, Belgium, Austria, Ireland, and of other scientific bodies.

Failing health led to his retirement some three or four years ago, and since then he lived chiefly in New York City, where he had apartments at the Park Avenue Hotel, and there he died on February 12. The meeting of the National Academy of Sciences held in New York, early November last, saw him for the last time assembled with his distinguished associates. Those who had known him in his prime were then shocked at the ravages which time and illness had made upon him, but he hoped for better days and they have come to him.

Sixteen years ago, shortly after he had retired from active work, this was written of him: "Although an indefatigable experimenter and an extensive observer, Dr. Hunt is also eminently an original and philosophical thinker, and has taken an influential part in the establishment of the most matured scientific theories. He was early in the field of chemical speculation, and aided essentially in that revolution of views which has ended in the establishment of a new chemistry." M. B.

IN the February number of *Nature Notes*, Mr. Robert Morley vouches for the accuracy of a story which seems to indicate the possibility of very tender feeling in monkeys. A friend of Mr. Morley's, a native of India, was sitting in his garden, when a loud chattering announced the arrival of a large party of monkeys, who forthwith proceeded to make a meal off his fruits. Fearing the loss of his entire crop, he fetched his fowling-piece, and, to frighten them away, fired it off, as he thought, over the heads of the chattering crew. They all fled away, but he noticed, left behind upon a bough, what looked like one fallen asleep with its head resting upon its arms. As it did not move, he sent a servant up the tree, who found that it was quite dead, having been shot through the heart. He had it fetched down and buried beneath the tree; and on the morrow he saw, sitting upon the little mound, the mate of the dead monkey. It remained there for several days bewailing its loss.