VOL. XV. MAY, 1893. NO. 5.
Issued September, 1893.

THE JOURNAL

OF THE

AMERICAN CHEMICAL SOCIETY.

LEWIS MILLS NORTON, PH.D.

DR. LEWIS MILLS NORTON, a member of the Council of the American Chemical Society, died after a short illness on April 26, 1893. He was born in Athol, Mass., and was the only son of the Rev. John Foote Norton and Ann Maria Mann. His early youth was spent in Athol, Wellesley, and Natick, Mass., and in Fitz William and Keene, N. H.

He was an earnest student of chemistry at the Institute of Technology for three years, from 1872 to 1875, when he was appointed assistant in analytical chemistry, in which capacity he served for two years. In May, 1877, he went to Europe and continued his chemical studies at Berlin, Paris, and Göttingen until August, 1879, and received his degree of Doctor of Philosophy from the University of Göttingen.

On his return to this country he entered the Amoskeag Manufacturing Company, of Manchester, N. H., as chemist, where he gained valuable practical experience which strongly influenced his subsequent career as a teacher of industrial chemistry.

In 1881 he returned to the Massachusetts Institute of Technology as instructor in general chemistry. In 1883 he was appointed assistant professor in organic chemistry, and in 1885 associate professor in organic and industrial chemistry. The combined duties of these two growing departments proved to be too much for one man to carry, and Dr. Norton gave up the systematic instruction in organic chemistry at the end of the Institute year in 1891, and after that time devoted his entire thought and strength to the subject of industrial chemistry, in which he was deeply interested.

In 1888 the faculty of the Institute of Technology, upon the scheme presented by Dr. Norton, founded the course in chemical engineering. That a course of study was needed which should add to a thorough training in mechanical engineering a fair knowledge of general, theoretical, and applied chemistry, was at once evident from the number of students of fine scholarship who entered the new course. Under Dr. Norton's fostering care the course in chemical engineering increased in numbers and efficiency. He gave it his best thought and effort, and happily saw before his death the course established on a firm foundation.

The kind of work for which the students are fitted in the course in chemical engineering at the Institute of Technology may be seen in the titles of the students' thesis work, which was superintended by Dr. Norton. In many cases, as will be seen in the list which follows, the investigations necessitated on the part of the student a knowledge both of the principles of chemistry and of mechanical engineering.

The Commercial Production of Oxygen by Electrolysis.

A Study of the Effect of a Live Steam Feed-Water Purifier on the Composition of the Feed-Water.

On the Production of Chlorine and Sodium Hydrate by the Electrolysis of Common Salt.

On the Heat of Vaporization of Ammonia.

Experiments upon the Relative Effect of Burners for Fuel and Illuminating Gases.

An Experimental Investigation of the Bisulphite Process of Making Chemical Fiber.

The Conditions of Maximum and Minimum Sulphuric Anhydride Formation in Burning of Sulphur.

The Explosion of Kerosene Lamps.

Experiments with Alloys Suitable for Digesters Used in Making Chemical Fiber by the Bisulphite Process.

On the Effect of the Aniline Black Process upon the Strength of Cotton Fiber.

An Investigation of the Efficiency of a Mechanical Stoker.

The Electrolytic Deposition of Nickel.

An Investigation into the Amount of Heat Lost in the Flue Gases from Steam Boilers.

An Investigation of the Specific Heat of Brines.

The professional papers contributed by Dr. Norton to various scientific and technical journals were very numerous, and in-

cluded a wide range of subjects. The following list includes his more important papers:

1878. (With A. Michael.) Ueber die Einwirkung des Chlorjods auf Aromatische Amine. *Ber. d. chem. Ges.*, 1878, 107.
1879. Ueber die Einwirkung von Chlorjod auf die Amine der Benzolreihe. Inaugural Dissertation. Pph., 8vo, pp. 36. Göttingen.
1879. (With A. Michael.) On the Action of Iodine Monochloride upon Aromatic Amines. *Am. Chem. J.*, 1, 255–267.
1880. (With same.) On Alpha—and—Beta Monobromcrotonic Acids. *Id.*, 2, 11–19.
1884. (With C.O.Prescott.) Continuous Etherification. *Id.*, 6, 241–246.
1884. (With W. R. Nichols.) Laboratory Experiments in General Chemistry, compiled for the Use of Students of the Mass. Institute of Technology. Pph. 12mo, pp. 58 and viii. Boston, 1884, 1885, 1886, 1887.
1885. Coal Tar, and the Colors Derived from It. *Proc. Soc. Arts, M. I. T.*, 1884–85, 29–33.
1885. Minor [Chemical] Investigations. *Am. Chem. J.*, 7, 114–120.
1885. (With A. W. Allen.) Ueber die Einwirkung der verdünnten Salpetersäure auf die Anilide. *Ber. d. chem. Ges.*, 18, 1995–1999.
1886. (With C. W. Andrews.) The Action of Heat on Liquid Paraffines. *Am Chem. J.*, 8, 1–9.
1886. (With A. A. Noyes.) On the Action of Heat upon Ethylene. *Id.*, 8, 362.
1887. (With H. J. Williams.) On the Action of Bromine on Isobutylene. *Id.*, 9, 87.
1887. (With C. B. Kendall.) Preparation of Alizarine Assistant and Its Action in Turkey-Red Dyeing. *Textile Record*, 1887, 227.
1887. (With W. D. Livermore.) Ueber die Einwirkung von verdünnter Salpetersäure auf Substituirte Amidoverbindungen. *Ber. d. chem. Ges.*, 20, 2268.
1887. (With H. A. Richardson.) Ueber Leinölsaure. *Id.*, 20, 2735.
1887–1888. The Dyeing of Cotton Yarn. *Textile Record.* A series of Articles from June, 1887, to March, 1888.
1888. (With H. A. Richardson.) On the Fatty Acids of the Drying Oils. *Am. Chem. J.*, 10, 57.
1888. Character and Effect of Illuminants Present in Coal Gas. *Technology Quarterly*, 11, 30.
1888. Natural Gas. *Proc. Soc. Arts, M. I. T.*, 1887–1888, 74.
1888. Bleaching. A series of articles in the *Textile Record*, beginning May, 1888.
1888. (With A. A. Noyes.) Note on the Butines. *Am. Chem. J.*, 10, 430.
1889. The Composition of Boston Gas. *Am. Gas Light J.*, 50, 303.
1889. Cutch and Its Uses in Textile Coloring. *Textile Record*, 1889, 34, 66.
1890. (With Herbert C. Tuttle.) Lactic Acids and Lactates in Textile Coloring. *Technology Quarterly*, 3, 287.
1890. Carbonization of Wool. *Textile Record*, 11, 64, 96.
1891. Notes upon the Estimation of Chlorine in Electrolyzed Solutions. *Technology Quarterly*, 4, 361.

Dr. Norton's influence on high scholarship at the Institute of Technology was felt in all departments of chemistry. The book of experiments in general chemistry, which he compiled in connection with the late Professor Nichols, has been a most valued aid to instruction at the Institute and has been largely used at other schools.

In organic chemistry his instruction was on a high plane, yet he never lost sight of the importance, in a school of this character, of insisting on the industrial applications of scientific research.

But it was in the teaching of industrial processes where he especially excelled. His lectures were listened to with eagerness by his pupils, who recognized the master who could deal with equal facility with the scientific basis of a process and with its economic merits. His range of subjects in industrial chemistry was very wide. Not only were the textile industries, bleaching, dyeing, printing, pigments, etc., thoroughly taught, but the great industries of the world in their manifold variety received from him exhaustive treatment. His intimate acquaintance with the manufactures and manufacturers in New England kept him in close touch with the progress of all its industries.

Dr. Norton's career as a chemist and teacher is remarkable for the amount and variety of good work which he accomplished in his short span of life, which had not reached two score years at his death. The Institute of Technology, with which his life was so largely identified, lost in his death not only one of its most valued teachers, but one of the most useful members of its faculty. His judgment, both in matters of general policy of the Institute and of the minute details of organization, was always highly prized by his associates.

His personal character was singularly simple, direct and truthful, and was unselfishly devoted to his family, his friends, and his students.

In 1883 Dr. Norton married Alice Peloubet, who, with five children, survives him.

T. M. DROWN.