

SAMUEL WILLIAM JOHNSON.

THE prominent chemist and teacher, and the most eminent figure in American agricultural chemistry, died at his home in New Haven on July 21st, 1909, in the 80th year of his age. Professor Johnson was born of Connecticut ancestry at Kingsboro, N. Y., July 3d, 1830, and spent his youth on his father's large and prosperous farm in Deer River, Lewis Co., in the same state.

His early education was obtained in the common schools and at Lowville Academy. It was at the latter institution that he became interested in scientific subjects, and his enthusiasm for chemistry led him to equip a laboratory at his home, where, guided only by his books, he pursued a systematic course in analytical chemistry—a very remarkable achievement for one so young.

At this period, when about 17 years old, his first recorded article, "On Fixing Ammonia," was published in the *Cultivator*. This was prophetic of his future career, and it was followed in later years by a great many important writings for the benefit of the farming community.

After having taught for two winters in district schools, Mr. Johnson, at the age of 18, began his long career in the teaching of science. He taught natural sciences for a year at the Flushing Institute, Long Island, and two years later he spent a winter as instructor in the same subjects at the New York State Normal School at Albany.

Meanwhile, in 1850, he had entered the Yale Scientific School, with which he was soon to be permanently connected, and studied chemistry, particularly the agricultural branch of the science, with Professors John P. Norton and Benjamin Silliman, Jr. During this period of study in New Haven, covering about eighteen months, he published two mineralogical notes in this Journal the first of his many publications here, and also wrote two articles for the *Cultivator*, the title of one of them, "Agricultural Education," being very significant of his interests at that time.

In January, 1853, he went to Germany, where he spent two years in study at Leipsic and Munich with the celebrated scientists Erdmann, Liebig, von Kobell, and Pettenkofer. During his stay in Germany he published in the *Journal für praktische Chemie* several articles and notes relating to his chemical investigations. This work was in pure chemistry, rather than on the agricultural side of it, and during his after life he took a deep interest in the strict science and made numerous contributions to it.

Leaving Germany early in 1855, he went to England and

spent that summer studying with Frankland. During his stay in Europe he acted as foreign correspondent to the *Country Gentleman*, and in that capacity published a large number of articles on agriculture. It is interesting to notice that one of the earliest of these letters described the Agricultural Experiment Station at Möckern, for he was destined to devote much labor towards the establishment of such stations in the United States, and it was chiefly due to his efforts that this object was finally accomplished, at first in Connecticut.

In September, 1855, having returned to New Haven, he became chief assistant in the chemical laboratory of the Yale Scientific School. The next year, 1856, he was advanced to the position of Professor of Analytical and Agricultural Chemistry. In 1874, owing to a modification of his duties, his title was changed, in what had now become the Sheffield Scientific School, to Professor of Theoretical and Agricultural Chemistry. This position he held until 1896, when he retired as Professor Emeritus.

Professor Johnson's long connection with the Scientific School added much to the fame of that institution. His career was closely connected with those of Professors Brush and Brewer, who began their work here at nearly the same time, when the School was very small. His teaching was chiefly in the lines of analytical, theoretical, and organic chemistry, for the demand for agricultural chemistry among the students was comparatively small. He always impressed his students by his wide and profound knowledge, and attracted them by his sprightly, cheerful disposition. He was a clear, fluent and philosophical lecturer.

While his teaching and his services to agriculture absorbed much of his time and attention, Professor Johnson's chemical investigations were also important. He was particularly skillful in devising new and improved apparatus and methods of analysis. In this connection may be mentioned his device for the accurate determination of carbon dioxide, his simpler substitute for the original soda-lime used for nitrogen combustions, his apparatus for extraction with volatile solvents, and his many researches, both alone and with the coöperation of others, on the analytical determination of the important constituents of fertilizers.

His services to agriculture were especially brilliant. Besides the multitude of more or less popular contributions to agricultural periodicals, he delivered many addresses to farmers, and as early as 1859 he gave a course of lectures on agricultural chemistry at the Smithsonian Institution. In 1857 he became chemist to the Connecticut State Agricultural Society, and for several years published in its *Transactions* the results of his examination of many fertilizers, and essays upon other topics.

Shortly after the establishment of the Connecticut Agricultural Experiment Station, for which he had labored so long and earnestly, he became its Director in 1877, and acted in that capacity until 1899. In this position he was eminently successful, setting an example to the stations of the same kind which were soon established in all the other states of the Union.

He was very conspicuous in his literary activity. His voluminous writings for the agricultural press have been alluded to already, and his official reports of the Agricultural Station, published annually for more than twenty years, should also be mentioned. He edited the first American editions of Fresenius's "Qualitative" and "Quantitative Analysis," and afterwards revised the former work, supplying it with the "new system" of chemical nomenclature and symbols. He published many of the results of his scientific investigations in this Journal, and was an associate editor of it from 1863 to 1879. Particularly during the earlier years of this period, he was also a copious contributor to its department of "Scientific Intelligence."

He was the author of several books: "Peat and its Uses as a Fertilizer and Fuel," 1866; "How Crops Grow," 1868; and "How Crops Feed," 1870. One of these particularly, "How Crops Grow," a treatise on the chemical composition, structure and life of the plant, should receive special mention as a very celebrated work. It was not only received with much favor in America, but an English edition of it was published, and it was translated into German, where it was honored with a preface by Justus von Liebig. It was translated also into Russian, Swedish, Italian, and Japanese. The author published a revised and enlarged edition of this work in 1891. It is fortunate that a full bibliography of Professor Johnson, up to 1892, was prepared by himself and published in "Yale Bibliographies."

Professor Johnson's services to science were widely recognized. He was elected to membership in the National Academy of Sciences in 1866, was president of the American Chemical Society in 1878, chairman of the sub-section of Chemistry, American Association for the Advancement of Science, in 1875, associate Fellow of the American Academy of Arts and Sciences, and at one time was president of the Association of American Agricultural Colleges and Experiment Stations.

Professor Johnson married Elizabeth Erwin, daughter of George H. Blinn, of Essex, N. Y., on October 13th, 1858. She and a daughter, Mrs. Thomas B. Osborne, of New Haven, survive him.

H. L. WELLS.