

A MEMOIR OF FREDERICK AUGUSTUS GENTH.*

FREDERICK AUGUSTUS GENTH was born May 17, 1820, at Waechersbach, in Hesse-Cassel, where his father occupied the position of "Forstmeister" to Prince Isenburg. He received his early training in the gymnasium at Hanau. His university studies began at Heidelberg. While there, although he exhibited much interest in mineralogical and chemical studies, and made frequent botanical and geological excursions, he does not appear to have definitely decided upon his future career. His earliest papers, which he published in 1842, while still a student, in Leonhard-Bronn's *Jahrbuch*, were upon subjects having reference to conchology, geology and mineralogy.

From Heidelberg he proceeded to Giessen, where the fame of that greatest of all teachers of chemistry, Liebig, was attracting students from all parts of the civilized world. There were assembled around this master many men whose names have since become illustrious in chemistry.

When Genth entered the Giessen laboratory, he met among others the two assistants, Fresenius and Will, and as fellow-students with such men as Hofmann, Wurtz, Strecker and Varrentrapp.

The master mind of the head of the laboratory and the scientific atmosphere of the place, had doubtless a great influence upon the young student, and gave his studies a definite direction; but it was under the guidance of Fresenius that he began his chemical exercises. In later years, Genth was wont to express his indebtedness to this great analyst for having laid the foundation of what was later to become the field of his principal scientific work.

At the same time, however, he continued zealously to cultivate the mineralogical studies, and he seems to have given special attention also to crystallography. * * *

* Report of a Special Committee of the Chemical Section. Read and accepted at the stated meeting held March 21, 1893.

Under Liebig's direction he made and published a chemical investigation of a new resinous body, which was given the name of masopin.

In 1843, he went to complete his university studies with Bunsen at Marburg. This eminent savant also had surrounded himself at this time with a circle of students, many of whom afterwards became famous. Among these appear the names of Kolbe, Frankland and Tyndall.

For three years he acted as Bunsen's assistant. His contributions to science during that time were numerous: a few of these related to geology, most of them, however, were on mineral-analytical subjects. The most important of the latter was an investigation of the metallurgical process of the Friedrichshütte near Riechelsdorf.

The results of this well-known research were embodied in the dissertation, which, in 1846, he submitted to the Philosophical Faculty of Marburg, which conferred upon him the degree of Doctor of Philosophy, after he had passed the required examination with high honors. * * *

In the following year, 1848, having meantime married, Genth came to this country. He took up his residence in Philadelphia, and here established an analytical laboratory. Most of his time was taken up with commercial work and with the instruction of young men. His leisure he devoted to original research. Thus he was occupied for more than twenty years.

In this time not less than fifty-six contributions from his pen have appeared, with notable regularity, in various scientific journals. His earlier papers appeared in Keller & Tiedemann's *Nordamerikanischer Monatsbericht* and the *Proceedings* of the Academy of Natural Sciences. His later work was published in the *American Journal of Science*, and several important communications appear in the *Journal of the Franklin Institute*.

He held, for many years, the post of chemist to the State Board of Agriculture of Pennsylvania, being the first to be elected to this office, and practically controlled the fertilizer trade of this State. One of the most prominent specialists in this branch of manufacture bears testimony that his

official work was always regarded as being absolutely reliable. This position he held until the recent establishment of the Agricultural Experiment Station in connection with the State College, to which was transferred the conduct of all researches in the interests of agriculture.

He was also, for a number of years, mineralogist to the Second Geological Survey of Pennsylvania.

In 1872, he was elected to the chair of chemistry and mineralogy at the University of Pennsylvania. This position he held until 1888, when differences with the administration caused his withdrawal.

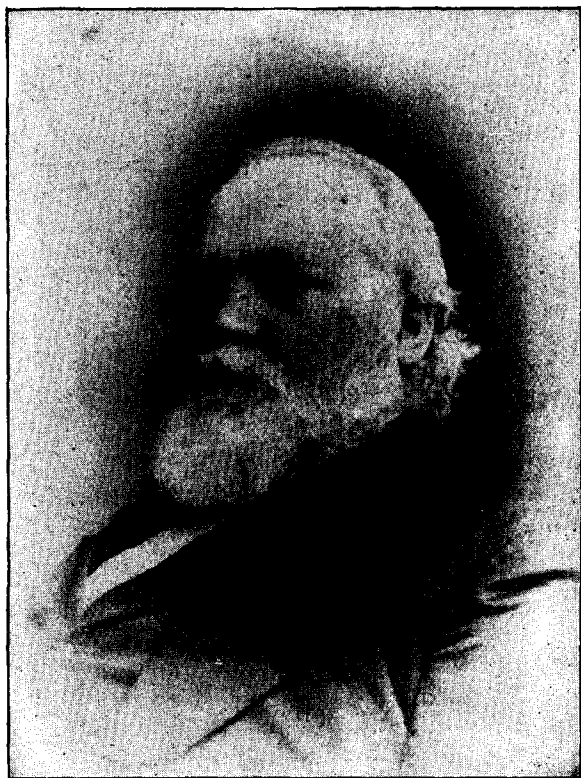
He was the recipient of many evidences of appreciation of his scientific work. He was a member of the National Academy, President of the American Chemical Society, and Honorary Fellow of the American Association for the Advancement of Science. For many years he was an active member of the Academy of Natural Sciences and of the Franklin Institute. He was an honorary member of our Section.

Notwithstanding the distractions of commercial work, to which he was compelled to devote much of his time, and, later on, those of a laborious professorship, he was able, thanks to his unflagging scientific enthusiasm and enormous capacity for work, to contribute more than one hundred papers embodying the results of his personal observations and researches during his professional career of about half a century.

In placing an estimate upon the scientific career of the subject of this memoir, it is not too much to say that he was one of the ablest mineralogists, and certainly the foremost mineral analyst this country has known.

His scientific labors embrace mineralogical, geological and chemical subjects, but valuable as are the results of his chemical researches, his fame will rest chiefly upon the contributions he has made to our knowledge of the minerals of this country. His name appears on almost every page of the records of mineralogy.

His innumerable observations and his careful analyses have helped to throw light upon every class of mineral



FREDERICK AUGUSTUS GENTH.

(1820-1893.)

species. Of the more than one score of well-established species which he added to the list of our minerals, we need only mention a few, such as nickel gymnite (named genthite by Dana), whitneyite, cosalite, coloradoite, psittacinite, aguilarite, calaverite, lansfordite and nesquehonite; but he deserves no less credit for the elimination of doubtful species and the characterization of others that had been imperfectly described.

In connection with his work in this direction, we should not omit to notice the elimination of owenite, harrisite, coracite, cherokine, and Endlich's schirmirite, and his characterization of roscolite, hiddenite and herderite. His most important contribution to mineralogy is probably his monograph on *Corundum: Its Alterations and its Associated Minerals*. His ingenious interpretation of the metamorphoses exhibited by this mineral, upon which, as well as his numerous careful analyses, his conclusions as to the character of the alterative operations of nature were based, have now been generally accepted by mineralogists and geologists.

His preliminary report, on the mineralogy of Pennsylvania, is an invaluable guide to the mineral history of the State, and the same may be said of his report on the minerals of North Carolina.

His contributions to chemistry proper are less numerous, though some are of considerable importance. In this category undoubtedly must be placed his famous discovery of the "Ammonia-Cobalt Bases," the credit of which, certainly belongs to him, notwithstanding the almost simultaneous announcement of those compounds by Claudet and Frémy. The joint investigation of these compounds by Gibbs and Genth is a classic research.

His much-quoted paper, on "The Metallurgical Process of the Friederichshütte," is replete with interesting results, notable among which is the discovery of an allotropic form of oxide of nickel contained in the metallic copper. Familiar to all the analytical fraternity is his method of analyzing chrome iron ore and his method of determining copper as oxide.

As a teacher Genth possessed, in a remarkable degree, the ability to impart knowledge. His method consisted substantially in inducing the student to cultivate the habit of close observation and reasoning rather than that of committing facts to memory. Many of his students have attained to positions of distinction, and will be able worthily to perpetuate his fame.

The personal character of the man could almost be predicted by those who never enjoyed the privilege of his acquaintance and friendship, from the sterling character of his scientific work.

He had in full measure the typical characteristic of the German nature, in his love for thoroughness and contempt for superficiality and sham. He was unaffected in manner, and though at times he may have exhibited a certain brusqueness even towards his friends and intimates, this eccentricity served only to attach them more closely to him. To them he was thoroughly devoted, and those who knew him best loved him most. His friendly interest in young men about beginning a scientific career exhibited one of the most charming traits of his nature, and the writers of these inadequate lines which they affectionately dedicate to his memory, gratefully recall from earlier days, the acts of considerate kindness and words of encouragement of the revered master whose life work is done.

His private life was blameless, and in his domestic relations, which were most happy, he was a devoted husband and father. He was twice married, and three sons and five daughters survive him.

WM. H. WAHL,
HARRY F. KELLER,
T. R. WOLF,
Committee.