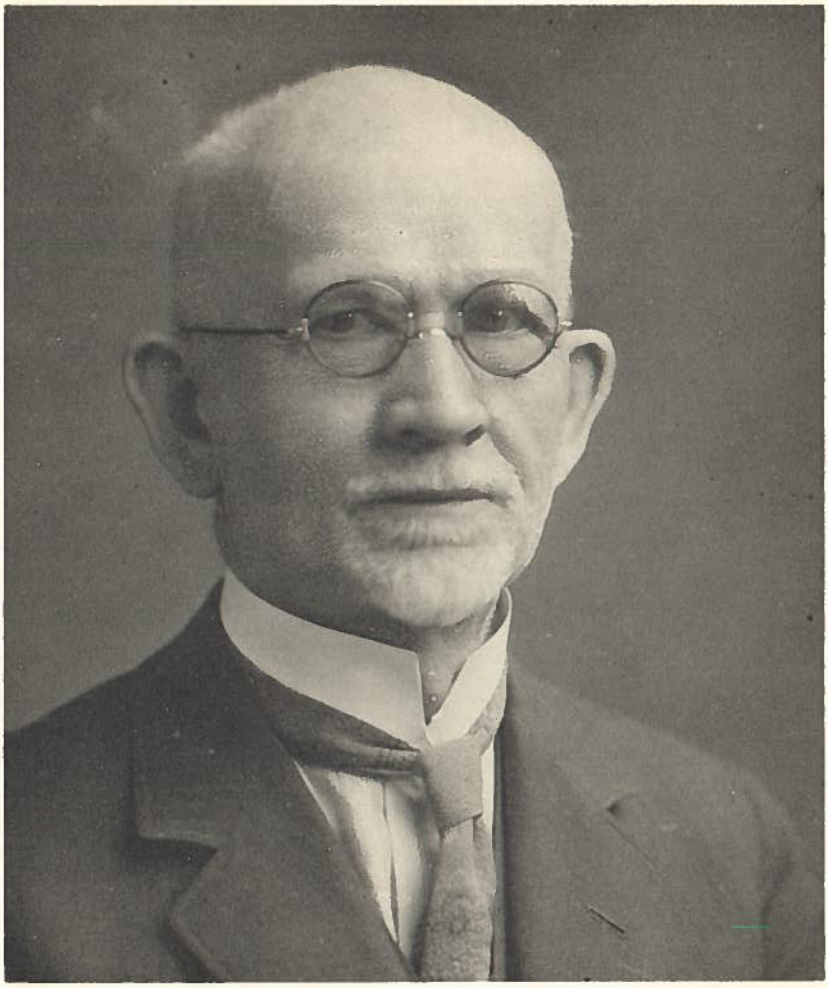

Aug F Foerste

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MEMORIAL OF AUGUST F. FOERSTE

BY R. S. BASSLER

With the passing of August Frederick Foerste at his home in Dayton, Ohio, on April 23, 1936, the rapidly diminishing circle of geologists who received their inspiration in the classic paleontologic area of southwestern Ohio, lost one of its best-known members. Like F. B. Meek, N. S. Shaler, U. P. James and his brother Joseph F. James, S. A. Miller, C. B. Dyer, E. O. Ulrich, Charles Schuchert, and J. M. Nickles, all of whom started their geological careers in that vicinity, Dr. Foerste was an outstanding example of those whose love for nature and fortunate early environment, united with industry, would have led to distinction in any of the natural sciences. Although best known as a paleontologist and stratigrapher, because practically all his publications are upon those subjects, Dr. Foerste's earliest interest was botany, his college training was in petrography, his professional career was teaching physics, but his latest and probably most important researches were on the structure and classification of Paleozoic cephalopods.

Born in Dayton, Ohio, May 7, 1862, of John August and Louise Wilke Foerste, he received his early education in the public schools of that enterprising city. As a young boy, he became acquainted with William B. Werthner, several years his senior, who was later to become a well-known botanist as well as teacher and principal of Steele High School at Dayton. As early as 1877, the two youths were a familiar sight as they roamed the moraine hills south of Dayton or excavated in the outcropping Ordovician and Silurian limestones and shales in search of natural history specimens.

An old swamp nearby, which yielded many botanical wonders, the glacial hills and dales south of the city, and a Mound Builders fort in the region, proved veritable mines of information for these two omnivorous collectors. During his first year in high school, Foerste had become so interested in flowering plants that, before graduation, he had accumulated an herbarium of more than a thousand species, all from a radius of 10 miles about Dayton, a limit set because it was the distance within which he could walk and collect in a single day. Arthur P. Morgan, specialist in fungi and myxomycetes, was at that time principal in one of the Dayton public schools, and his interest in the boy, as well as his large herbarium and library, made the identification of so many species possible. Mr. Morgan also taught him methods of discrimination, which were to become useful

in his later paleontological career. From a lecture delivered by Edward Orton during his early high school days, Foerste first learned the meaning of the word "fossil", and that fossils were common at the Soldiers' Home near Dayton. With the arrival within a week, as a gift from Professor Orton, of the first two volumes of the *Paleontology of Ohio*, his interest in paleontology started in earnest, and, during the next year, he collected almost daily in the Soldiers' Home quarry. For three years following his graduation from the old Central High School, he taught in a small country school near Centerville, Ohio, where the same strata, outcropping in a large quarry nearby, furnished many additional fossils. As a result, before entering the university his set of fossils from the formation then known as the Clinton, but later discriminated and named by himself as the Brassfield, was the most complete extant, and the description of its species not only formed the subject of his first papers but also led him to specialize on Silurian paleontology and stratigraphy.

Entering Denison University in 1883, his geological interests were further strengthened when Professor Charles L. Herrick joined the faculty in 1884. As Herrick was only four years the elder, the two found common interest in the local geology and soon were carefully collecting in the best fossil localities around Granville, which Foerste had discovered the previous year. During one of their trips to Flint Ridge in the eastern part of Licking County, Ohio, noted for its fine Pennsylvanian fossils, Herrick broached the question of a new journal of science to be published at Denison and invited Foerste to be a contributor. Thus, the Bulletin of the Scientific Laboratory of Denison University came into existence, with Herrick and Foerste the initial contributors. Foerste drew his own illustrations for his first articles, one on superposed buds in plants and the other on Brassfield fossils, both printed in the new journal. During a visit to Cincinnati in 1886, he became acquainted with E. O. Ulrich, who was then actively preparing his various monographs in invertebrate paleontology for the Illinois and Minnesota geological surveys. Here commenced a lifelong friendship and close scientific association of great benefit to science, because these two totally different temperaments checked each other's work.

Graduating from Denison in 1887 with the B.A. degree, Foerste had the opportunity of studying at Harvard the next three years, receiving his M.A. degree in 1888 and his Ph.D. in 1890. Here, the influence of environment was again manifested, for he majored in physical geography under William M. Davis and in petrography under John E. Wolff. Paleontology at this time, however, was not forgotten, because, during these three years at Harvard, he not only served as laboratory assistant under Professor Shaler but was in frequent contact with Alphaeus Hyatt, then in charge of the paleontological collections, who aroused his interest in Paleozoic

cephalopods. During his Harvard years, he also served as part-time assistant in the United States Geological Survey to Professor Shaler and Raphael Pumpelly. He had now decided to make petrography his chief interest, his doctorate thesis having been upon that subject. Therefore, the following two years were spent at Heidelberg University, pursuing advanced studies on that subject under Rosenbusch and Osann, and at the Collège de France under Fouque and Lacroix. During this time, his vacations were, as before, devoted to work with the United States Geological Survey in the division of Archaean geology, in problems on New England stratigraphy and petrography. Apparently, he had planned a geological career with the Federal Government, and, indeed, in the Thirteenth Annual Report, he is mentioned as working in Vermont with T. Nelson Dale. However, when, in 1892, the Survey appropriation was drastically cut, he had to seek employment elsewhere. At this time of national depression, he was glad to accept an offer from his friend, Raphael Pumpelly, to spend a year as tutor on his Georgia plantation. Although far from his special subjects of research, Dr. Foerste here took up the study of the Tertiary rocks of Georgia and Florida and within a year had published two papers on their correlation.

Then in 1893 the opportunity came to return to Dayton as science teacher at Steele High School, where he remained continuously until his retirement in 1932, at the age of seventy. In the earlier years of his teaching career, he instructed in several of the natural sciences but soon restricted himself to the teaching of physics, as he felt he could render more service to his community in that way. Dayton, even at this date, was a busy manufacturing city, with many of its industries based upon physics and its application, so that Dr. Foerste's advice was often sought by friends who were leaders in the city's business affairs. Although, during the ensuing 28 years, he received many offers from colleges and universities to teach geological subjects, he refused them because he felt his position at Steele High School, while giving him his living and the opportunity for service, interfered less with his scientific research than would a more conspicuous college position. His working day was well occupied with lectures and laboratory duties in physics, but he early learned the value of spare moments and how these, with class study periods and school holidays, aggregated a goodly amount of working time if industriously employed. He had the happy ability to be able to plunge immediately into a subject, so that the ten-minute interval between classes was never lost; a collection of fossils was always near at hand for preparation or study. Thus, in the course of years, he accumulated a large collection of Paleozoic invertebrate fossils, including many hundreds of type specimens, and had installed them in his school laboratory, together with manuscripts and many notes on field work. This was unfortunate, because at the time of

the Dayton flood, March 24–31, 1913, the waters of the Miami River swept through the high school building, carrying away his manuscripts and a considerable part of the collection. Fortunately, most of the fossils had been packed in wooden boxes, which were left stranded by the receding waters at various points down the Miami Valley and were retrieved by Dr. Foerste's many friends throughout the area. Instead of lamenting his fate over the loss of his manuscripts, he plunged into work again, this time on engineering problems connected with the Miami Conservancy system, for which he was well fitted because of his experience in both geology and physics.

During this long teaching period, Dr. Foerste was employed during the summer vacations as special assistant on various State geological surveys. Thus, in the Indiana Geological Survey under Blatchley, he spent the summer seasons of 1896, 1897, and 1899 in studies on Silurian geology and paleontology; likewise, he served for six field seasons under Edward Orton and John Bownocker, between 1908 and 1919, in mapping the boundaries of the various Ordovician and Silurian formations and other problems of Ohio, and in 1904 to 1912 on the Kentucky Geological Survey under Norwood, where the mapping and correlation of Mississippian and Pennsylvanian rocks received much of his attention. He also was engaged on the Geological Survey of Canada for several summer seasons, under R. W. Brock, this work resulting in the publication of several memoirs on the Ordovician of Ontario and Quebec. Beginning about 1920, he spent each summer vacation at the United States National Museum, in various lines of research on invertebrate paleontology, until his retirement from teaching in 1932, when, appointed associate in paleontology at the Museum, he moved to Washington and devoted all his time to studies there, having previously presented his vast collections to that Institution.

A fellow of the Geological Society of America since 1899, Dr. Foerste was one of the founders of the Paleontological Society, of which he was president in 1928. He was a member of the American Association for the Advancement of Science, the Ohio Academy of Science (president 1931), and the Washington Academy of Sciences. In February 1926, he was presented with a life membership in the Engineers Club at Dayton, in recognition of his contributions to science, there being few other honorary members, among them Orville Wright, Col. E. A. Deeds, and Charles F. Kettering. At the presentation, Mr. Wright was cited "for his experiments in the skies", and Dr. Foerste "for his explorations in the earth below". During his school days he was awarded membership in the Phi Beta Kappa, and was one of the founders of Lambda Deuteron chapter of the Phi Gamma Delta fraternity at Denison. In later years, he was representative of the Paleontological Society of America at the National Research Council. Had he been a member of some university group or more

important organization, his name and work would have received the recognition and honors from the scientific world that he deserved. His publications on Ordovician and Silurian paleontology and stratigraphy alone are so numerous that they far outweigh the work of men who have received many more honors in the science. He was content to record facts and rarely indulged in speculations, though often better equipped to do so than some who habitually deal in this form of science.

Dr. Foerste's bibliography, numbering about 135 titles, shows three phases into which his most important scientific productions may be divided —namely, a period from 1885 to 1903, when he was occupied largely with Silurian stratigraphy and paleontology of the Ohio Valley; followed by a time of about equal length, when he specialized on the Ordovician rocks and fossils of the United States and Canada; and, finally, the interval from 1920 to 1936, when he pursued his researches on Lower Paleozoic cephalopods at the National Museum. As an alumnus of Denison University, he contributed many articles to their journal—in fact, half his publications appeared there. Fortunately, he published his contributions as they were completed, and, in order to do this, in many instances, he personally paid the cost of engraving the plates. His Silurian researches were interspersed with other occasional studies, not the least of which was a volume in 1915 on *The Geology of Dayton and Vicinity*, in which he described the glacial history, especially of the great gravel ridge area south of Dayton, where he and Professor Werthner had roamed and studied in boyhood. His dream that this area might be preserved as a public park has been realized through the private generosity of several Dayton business friends who made possible the "Hills and Dales" and the "Moraine Park" of that city's present park system.

One of Dr. Foerste's greatest services to paleontology has been the re-study, re-description, and illustration of literally hundreds of species of invertebrate fossils inadequately described and figured by earlier authors. This thankless task of validating the work of others has been a great benefit to science and has cleared up many problems in American Paleozoic paleontology.

Most of his papers in the last ten years deal with lower Paleozoic cephalopods, the study of which was influenced by his association at Harvard with Alphaeus Hyatt, but more particularly in later days with E. O. Ulrich, who had invited him to collaborate in the preparation of a monograph on the cephalopods of the Ozarkian-Canadian system. The preparation of the monograph was interspersed with occasional small pieces of research on some other subject, and articles on the cephalopods of Ordovician and Silurian faunas from various parts of the world. The vast number of new genera and species of cephalopods which he created caused surprise among some paleontologists, but the group had not been thor-

oughly studied since the days of Hyatt and Clarke, and not at all by the newer methods. The earlier workers described most cephalopods from their external forms, with little or no attention to internal structure, but Dr. Foerste soon realized that the latter had the most systemic value, with the result that he has added more to knowledge of this phase of the subject than any other student. Dr. Foerste's scientific papers are marked by the completeness of description in his paleontological work and by an abundant record of facts in his stratigraphic articles. He always set down his facts without respect to any preconceived opinion and sometimes without merging them into a connected problem. He did not trust his memory, and it was his custom to plan his work in writing and to check off each task as it was completed. This custom very probably led him to record his facts for publication as soon as possible and sometimes not in the most logical order. His geological papers, therefore, form a mine of information for the student who will dig out the facts, or, better still, prepare an index of the papers. Such an index in the National Museum geological library fills forty typewritten sheets. His bibliography also gives evidence of his boundless energy in that he has published more than 2,000 pages of stratigraphic geology and nearly 3500 pages in paleontology, accompanied by more than 650 plates. Of these, more than 1600 pages and 180 plates were devoted to fossil cephalopods. When one considers that paleontology was his pastime and not his vocation, his printed record is almost incredible.

Notwithstanding his devotion to technical science, Dr. Foerste was thoroughly human. He was a man of temperate habits, but for those who worked with him he set a strenuous pace whether in traveling afoot over the country on a geological trip or in working on some laboratory problem. He was widely read so that he could speak with authority and intelligence on many subjects outside his special field, yet he was a modest and unassuming man, who asked nothing for himself but freedom to learn and to serve. He had his hobbies, which he also pursued energetically. One was the study of foreign languages, one after the other, so that he would have a working knowledge of them in case of need. In this way, not only the usual European languages were familiar to him, but he secured a reading knowledge of Japanese, Russian, and Arabic. The engineering processes employed in erecting the many new government buildings in recent years in Washington held daily interest for him and made a walk with him around these projects a conducted tour sprinkled with much wise comment. He was as interested in card playing as he might have been in a rare or strange fossil, especially his favorite games of rhum and five hundred, because they gave the best opportunity to mingle with his friends. He greatly enjoyed going on picnics and fishing parties, even though he rarely fished. Typical of his industrious nature, his pleasure was in gather-

ing wood, making fires, and the many small jobs that had to be done. His knowledge of plants, rocks, and fossils added to the interest of such outings, and he never tired of answering even the most foolish questions. Many of these picnics turned out, in fact, to be natural history classes. A lover of good music, one of his greatest pleasures was to attend a good concert. His love for other fine arts was equally great. While at Harvard, he played the pipe organ at the Congregational Church in Cambridge, and he also played in church in Dayton, yet he never took a music lesson. He learned to play by studying and practicing on his sister's melodeon and by getting what help he could from books.

Dr. Foerste was a forceful speaker, with a strong booming voice trained by his many years of public addresses and lectures before large classes, so that, so far as presentation was concerned, there was never any reason for misunderstanding him. Again, he would become so interested in a subject under serious discussion, or even in casual conversation, that there could be no deviation from it by either party. Thus, in his later years, when the cephalopods occupied most of his thoughts, he would discuss their intricate problems under any and all circumstances. It was, therefore, natural that, at one of the dinners of the Pick and Hammer Club at Washington, he should be greeted with the following, which he enjoyed as much as anyone else:

> Cephalopods haven't a chance
> To resist my systemic advance
> I've sawed 'em and split 'em
> Disemboweled and refit 'em
> And nothing escapes from my glance.

A strict disciplinarian, he always retained the respect of his students. As one of them testified feelingly at a memorial meeting in his honor: "On the whole he didn't like girls, but when one of us made him look up from his microscope to reprimand us for talking, we felt we were impeding the progress of science."

Having been for so many years in constant contact with young people, his mind remained ever young and singularly open on the various problems on which he was working. Thus, he naturally enjoyed the society of the younger group at the Museum, who all loved and respected him, and he also felt the benefit of their frank comments.

Dr. Foerste never married but made his home at Dayton with his widowed sister, Mrs. Martha Dornbusch, and her three children, whom he regarded as his own family and personal concern. Subsequent to his retirement from teaching and moving to Washington, he made frequent trips home, and it was at the close of such a visit that he was stricken by a heart attack and succumbed in his sleep. He was buried in Woodland cemetery at Dayton, in the heart of the region he loved so well and made

famous in the scientific world. He is survived by Mrs. Dornbusch, two nieces, Florence B. and Louise M. Dornbusch, of Dayton, and one nephew, Walter J. Dornbusch, of Hazelton, Pennsylvania.

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