GEORGE JARVIS BRUSH

GEORGE JARVIS BRUSH, LL.D., professor of mineralogy, emeritus in Yale University, died at his home in New Haven on February sixth in his eighty-first year. He was the last survivor of the first class to graduate from the Scientific School and the last member of a small group of distinguished men, who in the early days of the school devoted their lives to its service. With him passes a scientist who did much for the development of the science of mineralogy in this country and one who did even more for the general cause of scientific study and research.

He was born in the city of Brooklyn, December 15, 1831. An illness when a boy forced him to spend a year in the country and from this arose an interest in agricultural problems which later led him to Yale to take the newly established course in agricultural chemistry taught at that time by Professor J. P. Norton. In this way he became deeply interested successively in the subjects of chemistry, metallurgy and mineralogy. He entered Yale in 1848, leaving in 1850 to become an assistant in chemistry to Professor Benjamin Silliman, Jr., at Louisville. He received, however, in 1852 the degree of Bachelor of Philosophy with his class at Yale. In the same year he became an assistant in chemistry at the University of Virginia. It was here that he did his first important work in mineralogy in collaboration with Professor J. Lawrence Smith. Together they published a series of articles entitled "Reexamination of American Minerals," in which many new analyses were given and many points clarified which had been obscure in the early descriptions of American minerals. In 1853 Brush went abroad and spent two years of study in the laboratories at Munich and Freiburg. He returned to New Haven in 1856 as professor of metallurgy, which title he retained until 1864, when it was changed to professor of metallurgy and mineralogy. In 1871 the title was again changed to professor of mineralogy and this was retained until his death, the word emeritus being added in 1898 when he retired from active duties. He was deeply interested in the development of the new scientific school in which he taught and was largely instrumental in its incorporation as the Sheffield Scientific School in 1861. He became the first director of the institution in 1872 and retained that office until his resignation in 1898. The earlier years of this period were critical ones, not only for the Sheffield Scientific School, but for the general cause of scientific education in this country. It is to be remembered that the public sentiment toward science was very different then from what it is to-day. At that time men like Professor Brush were especially needed who, with courage and far-sighted ideals, could strive against and gradually overcome the general distrust and disfavor with which scientific education was considered. In the scientific school he gathered a faculty of notable men about him and through his enthusiasm and faith inspired them with a devotion and unity of purpose which has had few parallels.

Much of his power lay in his ability to successfully organize and direct. That he had a keen business sense is shown in the material advancement of the school under his leadership and also in the fact that his services were always in demand by various public business organizations as a director and officer.

In his younger days, before his administrative duties became too heavy, Brush did considerable investigation in mineralogy, as the appended bibliography will show. He was, furthermore, always an inspiration to other workers in that field. It was through his enthusiasm and interest that the remarkable mineral locality at Branchville, Connecticut, was thoroughly explored. The results of these investigations were published in a series of papers by him in collaboration with Professor E. S. Dana. The work also involved a series of chemical analyses by S. L. Penfield and H. L. Wells, who were at that time graduate students in the Scientific School. Penfield later became assistant to Brush and finally succeeded him as acting professor of mineralogy

when administration duties compelled the latter to relinquish his teaching.

Brush also did much important work along the lines of the systematization of mineralogy. He wrote the eighth, ninth and tenth supplements to the 4th edition of Dana's "System of Mineralogy." He assisted in the preparation of the 5th edition of that book and wrote its first appendix. In 1874 he published his "Determinative Mineralogy and Blowpipe Analysis," a book which passed through fourteen editions until 1898 when it was revised by S. L. Penfield.

He commenced to assemble a mineral collection when a boy of fifteen years of age. His first specimen, which is still preserved, was collected at Salisbury, Connecticut, in 1846. This was the nucleus of what has since grown to be a collection of more than fifteen thousand specimens. The Brush Mineral Collection, as it is called, is in many ways unique. The idea that its founder always had in mind was to make it a collection for study rather than one for exhibition. It does not include, therefore, as many large or striking specimens as some of our public collections, but is, on the other hand, particularly rich in representative and type material. It is the repository of most of the minerals which have been the subject of investigation at Yale during the last forty years. From the viewpoint of the student of mineralogy, therefore, it ranks high among the mineral collections of the world. Together with a large mineralogical library it was given to the Sheffield Scientific School in 1904 accompanied with an endowment fund to provide for its future maintenance. The Brush Mineral Collection will therefore always remain one of the treasures of Yale and form a notable monument to its founder.

Professor Brush was elected a member of the National Academy of Sciences in 1868 and received the degree of Doctor of Laws from Harvard University in 1886. He was president of the American Association for the Advancement of Science in 1880. He was an honorary member of the Mineralogical Society of England, was a foreign member of the Geological Society of London, of the Geological Society of Edinburgh, of the Royal Bavarian Academy of Sciences of Munich and various other learned societies, both at home and abroad.

It is seldom that we have a man of such wide influence along so many different lines who can combine, as he did, the activities of the scientific investigator, the duties of the organizer and the services of the public-spirited citizen. His character, combining, as it did, the scientist's demand for truth and accuracy with the kindly spirit of the broad-minded gentleman, was an inspiration to all who knew him. His optimism, his generous nature, and his readiness to serve were qualities that endeared him to his colleagues and to the many students with whom he came in personal contact.

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1853. "Reexamination of American Minerals" (with J. Lawrence Smith), three papers, *Amer. Jour. Sci.*, Vol. 15, p. 207, Vol. 16, p. 41 and p. 365.
1854. "Chemical Composition of Clintonite," *Amer. Jour. Sci.*, Vol. 18, p. 407.
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1858. "On Chalcodite," *Amer. Jour. Sci.*, Vol. 25, p. 198.
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1859. "On Boltonite," *Amer. Jour. Sci.*, Vol. 27, p. 395.
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1861. Ninth supplement to Dana's "Mineralogy," *Amer. Jour. Sci.*, Vol. 31, p. 354.
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1863. "On Childrenite," *Amer. Jour. Sci.*, Vol. 36, pp. 122, 257.
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1864. "On Tephroite," *Amer. Jour. Sci.*, Vol. 37, p. 66.
1865. "On Artificial Diopside," *Amer. Jour. Sci.*, Vol. 39, p. 132.
1866. "On Cookeite and Jefferisite," *Amer. Jour. Sci.*, Vol. 41, p. 246.
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1867. "Native Hydrates of Iron," *Amer. Jour. Sci.*, Vol. 44, p. 219.
1868. "On Sussexite," *Amer. Jour. Sci.*, Vol. 46, pp. 140, 240.
1869. "On Hortonolite," *Amer. Jour. Sci.*, Vol. 48, p. 17.
"On Durangite," *Amer. Jour. Sci.*, Vol. 48, p. 179.
"On a Meteoric Stone from Alabama," *Amer. Jour. Sci.*, Vol. 48, p. 240.
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1872. Appendix to the fifth edition of Dana's "Mineralogy." New York.
1873. "On Anglesite from Arizona," *Amer. Jour. Sci.*, Vol. 5, p. 421.
1874. "Manual of Determinative Mineralogy." New York.
1876. "On Durangite," *Amer. Jour. Sci.*, Vol. 11, p. 464.
1878–90. "On the Mineral Locality at Branchville, Connecticut" (with Edward S. Dana), five papers, *Amer. Jour. Sci.*, Vol. 15, pp. 398, 481; Vol. 16, pp. 33, 114; Vol. 17, p. 359; Vol. 18, p. 45; Vol. 20, pp. 257, 351; Vol. 39, p. 201.
1880. "On the Relation of Childrenite and Eosphorite" (with Edward S. Dana), *Amer. Jour. Sci.*, Vol. 19, p. 316.
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1881. "On American Sulpho-selenides of Mercury," *Amer. Jour. Sci.*, Vol. 21, p. 312.
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WILLIAM E. FORD[1]

THE RAINEY AFRICAN EXPEDITION

MR. EDMUND HELLER, who represented the Smithsonian Institution on Mr. Paul J. Rainey's African Expedition, writes from Kisumu, British East Africa, January 26, 1912, that the expedition has been completed but that a delay has been caused in the shipment of specimens collected by Mr. Rainey and himself, due to the lack of porters, transportation facilities, etc. The collection, which arrived at Nairobi two weeks prior to the date of his letter, has been packed and forwarded by him to the Smithsonian Institution. While waiting for a steamer from Mombasa, Mr. Heller put in a couple of months in making collections at various stations of the Uganda Railroad, including some districts not touched by the Smithsonian Expedition under Colonel Roosevelt, and also about Lake Victoria Nyanza. By this means he has been able to add many species to the Smithsonian collection, as well as to finish a really complete survey of the mammals of British East Africa. He will probably spend a few weeks at the British Museum, and at the Berlin Museum, in comparing and identifying some of the specimens collected. The trip was most satisfactory in every way, and Mr. Heller estimates that the collection will rival that made by the Smithsonian African Expedition under Mr. Roosevelt in 1909 and 1910. In all there are about 700 large mammal skins in salt, 4,000 small mammal skins, and a large number of

[1] Assistant professor of mineralogy in the Sheffield Scientific School of Yale University and curator of the Brush Mineral Collection.