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OBITUARY

George William Brindley—In Appreciation

George W. Brindley died at his home in State College, Pennsylvania, on the afternoon of October 23, 1983. He is survived by his wife, his son and daughter, four grandchildren, a brother, hundreds of mineralogists, thousands of others whom his work touched, and a body of research of lasting value. In a science which has enjoyed the attention of some special people, Brindley was special indeed. The reason for his unique position is as complex as the clay minerals he so loved to study.

Brindley was born in Stoke-on-Trent, England, on June 19, 1905, the son of a school teacher and a descendent of the renowned 18th century canal builder, James Brindley. These canals, incidentally, were heavily used in moving Cornish china clay to Stoke-on-Trent. He attended Manchester University in the 1920s, studying in the laboratory of Sir Lawrence Bragg and R. W. James, and earning BSc and MSc degrees. For a year during this period, he taught general subjects in secondary schools as required by his educational grant. Brindley then moved to Leeds, where he obtained his Ph.D. and remained there first as lecturer and then as reader in physics. During the 1930s his interests lay in deformation of metals, X-ray physics, and lattice vibration. This background contained seeds of Brindley's later career: a firm foundation in theoretical physics, a background in experimental techniques from men like Bragg and James, a love of and an understanding of teaching, and even ancestral acquaintance with clays.

When World War II disrupted research at Leeds, Brindley developed interest in wind-blown sands, and thus geological subjects, and planned some mineralogical work. Shortly after the war, he was asked to determine the difference between china clay, fire clay, and halloysite. "I thought the project would take a few weeks, but here I am still working on it several decades hence," is how Brindley characterized his introduction to clay mineralogy. The seeds so carefully sown rapidly took root and developed luxuriant foliage. The determination of the crystal structure of kaolinite and the classic *X-ray Identification and Crystal Structure of Clay Minerals* (with G. Brown) were early fruits. Brindley came to the United States in 1953 and helped establish one of the leading clay mineral laboratories at the Pennsylvania State University.

Brindley's very high standards and total commitment to clear, analytical thought earned him a formidable reputation. Fuzzy thinking he would demolish with a devastating quip; yet, when convinced that an alternate viewpoint had merit, he would graciously agree. Brindley had a deep and warm concern for his associates and his well-honed sense of humor and kindly advice smoothed many an obstacle for them. He was very devoted to his family. His outside interests, followed with the same gusto as science, included photography, travel and gardening. The Brindleys' front yard sported the world's only cubo-octahedral yew.

What was the Brindley laboratory at Penn State like? The staff included graduate students, research associates, and established scientists with backgrounds ranging from theoretical physics to field geology. It had a very strong international flavor. Projects ranged from crystallography and kinetics of high temperature solid state reactions to clay-organic interactions. Such a mix of viewpoints was an excellent arena for new ideas to develop. Brindley's strong management kept the group a coherent whole. His was a hard-working, shirt-sleeves laboratory. Each newcomer soon was busy assembling a piece of equipment or at least painting benches. It was the best painted laboratory in the world. Brindley was never a slave to his instruments for they were not ends in themselves but only means to learn some truth. Mechanically simple but intellectually profound experiments were encouraged. For Brindley, no wall existed between university research and teaching. He spent as much effort preparing undergraduate lectures as preparing a paper for an international meeting. Not until a worker had thought through every question and implication would he or she approach Brindley on a puzzling piece of data or new idea. When convinced that the preliminaries were accomplished, he would spend hours offering suggestions and encouragement and searching for and usually achieving some new insight. When the research work appeared in publication, it was logical, concise, and beautifully written. In short, those who experienced his laboratory not only learned the needed theoretical background and experimental techniques, but also learned how to think analytically and write clearly.

His years at Penn State proved very productive. He served in a number of professorial posts and for several years was head of the Department of Ceramic Technology. Although he became emeritus in 1973, he never really retired but continued to supervise a small group of graduate students to the very end. Many honors came his way, among them the Mineralogical Society of America's Roebling Medal, an honorary doctorate at the University of Louvain, a Distinguished Member of our own Society, and Penn State's Wilson Award for Outstanding Graduate Teaching.

Two days before he died he received with gratitude the book of greetings signed by his friends and colleagues attending our annual meeting in Buffalo and approved of the proposed Brindley lecture. He said it was a great honor; the honor really was ours.

George Brindley was a theoretical physicist who turned from the usual path of perfect model systems to climb the muddy slope of clay minerals and find order in their own disorder. He was the archetypical scientist who set high standards for truth and showed others how to attain it. He was an understanding human being. He was a very special person indeed.

WILLIAM F. MOLL

Editor's Note—George W. Brindley's name has appeared on the masthead of *Clays and Clay Minerals* as an Associate Editor for sixteen years, ever since the Journal was first published in 1968. He served in a similar capacity for five of the annual proceedings volumes that preceded the present periodical. His keen mind and dedication to quality scientific reporting will be sorely missed.

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