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## MEMORIAL OF BRONSON F. STRINGHAM

July 28, 1907-May 30, 1968

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Professor Bronson F. Stringham died during the night of May 30, 1968, from heart failure. He was then 60 years old but had suffered a severe heart attack about three years earlier, from which he had recovered sufficiently to resume his duties at the University of Utah. He was teaching his usual classes in mineralogy and optical mineralogy, and in addition he was assisting at a seminar on rock alteration two nights a week. He had



*Bronson F. Stringham*

also been quite active on field trips a few weeks earlier and seemed to be his normal, active self up to the time of his death. He is survived by a son Michael Kerr and two daughters Cynthia Ann and Susan Marie, and by his wife Lucille Oblad Stringham.

Besides being a Fellow in the Mineralogical Society of America he was also a Fellow of the Geological Society of America and a member of the Society of Economic Geologists, the American Institute of Mining and Metallurgical Engineers and was a charter member of both the Geochemical Society and the Clay Mineral Society. He had much to do with starting the Utah Geological Society and was a past President of that organization. He also found time to take an active part in the honorary geological society Sigma Gamma Epsilon and was twice Vice President of the Western province of SGE and was elected to the position of Grand Historian in 1965, a position he held until he died.

Professor Stringham was born in Salt Lake City, Utah, July 28, 1907 and came from pioneer stock. One of his grandmothers came across the plains as a girl in an ox cart with her family and from her he early acquired an abiding interest in the pioneer history of Utah. His life-long interest and enthusiasm for mineralogy and geology was instilled at an early age by the stimulating friendship of a neighbor, Dr. Frederick J. Pack, who was a Professor and Head of the Dept. of Geology at the University of Utah. Bronson had no hesitation in majoring in geology and mineralogy when he finally went to the university for his undergraduate education.

During his student days at the University, he was able to spend several summers assisting Dr. Herbert E. Gregory in his mapping of the rocks of southern Utah and in that hot colorful country he acquired a taste for field work which stayed with him throughout his life. After receiving his B. S. degree in 1933, he went on to graduate work at Columbia University where the influence of Professors Paul Kerr and Charles H. Behre set his interest in mineralogy and geology for a continuing career in these fields. He returned to the University of Utah as an instructor in 1936 but spent much of his spare time and his summers studying the geology of a small mining district about 30 miles west of Eureka, Utah; the results of this study were incorporated in his doctoral thesis resulting in the degree Ph.D. from Columbia in 1941. That year was a banner year for Bronson. Not only did he get his Ph.D. and a promotion to Assistant Professor, but on September 25, 1941 he married a lovely geology student of his by the name of Lucille Oblad, to whom he had become engaged while teaching geology as an instructor.

The West Tintic district of Utah, Bronson's thesis area, is one in which the carbonate section of Paleozoic age has undergone a wide variety of

changes, and its pyromasomatism presented a challenging study that fascinated young Stringham and was the beginning of a life-long interest in rock alteration as related to ore deposits and to igneous and hydrothermal activity. In the latter part of World War II he got leave from the University to spend a year in the East Tintic district, where he worked with T. S. Lovering and his group, who were studying the geology, rock alteration and geochemistry of that area as related to blind ore bodies. Stringham did much of the petrographic work after he joined the party, but during this time he also broadened his knowledge of underground geology and the mapping of altered rocks at the surface. The result was an important contribution (Stringham with Lovering, *et al.* 1949) to our understanding of rock alteration sequences in this area. While on this job he became unusually adept at working with fine-grained aggregates of hydrothermal and supergene alteration minerals and especially in recognizing different varieties and species of such minerals optically—a difficult skill! He was a careful worker and devised many methods of checking the optical determinations. Some of these techniques were incorporated in a table which accompanied Monograph I, Economic Geology, and he was engaged on a revision of this table at the time of his death. He planned to bring it up-to-date and to include the most modern techniques now available.

His work in the East Tintic district included not only the surface mapping of fresh and altered rocks, which he loved, but also underground mapping in abandoned parts of working mines, work that he detested. The study of open pit mines, however, he found fascinating and some of his major contributions resulted from his unusual combination of field experience in altered rocks and the background of solid mineralogical and petrographic know-how with which he was blessed. This combination made him an unusually valuable teacher and led to rapid promotion when he returned to the University of Utah in the Fall of 1945. He was made Associate Professor in 1946, Acting Head of the new Department of Mineralogy in 1948, and Professor and Head of the Department in 1950, a position which he retained until his death.

Bronson was a member of the select and valuable small group of mineralogists who are interested not only in paragenesis as worked out under the microscope but even more in the paragenetic relations as they can be established by field studies.

The problem of the relation of alteration types to igneous rocks fascinated him and resulted in studies of hydrothermal rock alteration in mining districts and of granitization, especially as exemplified in the Bingham open pit, and of the significance of the common association of prophyritic rock with ore deposits. His interest in these relations and

passion for field work ultimately led to what many regard as his most important contribution: "Relationship of Ore to Porphyry in the Basin Range Provinces" (1958) in which he pointed out that nearly all disseminated copper ores are found in porphyritic rocks and not in holocrystalline granite or monzonitic rocks. During his field studies he visited and collected from virtually every stock in Utah, Nevada and Arizona and many of those in Colorado. His interest in mineralogical minutia also is evident in his publications, and he discovered and named a new mineral tenticite, which was later found to be extremely rare but was recognized by Russians in the Soviet Union many years later. His knowledge of hydrothermal alteration and particularly of argillic alteration soon made him a specialist in the field relations and identification of clay minerals. This in turn resulted in his major consulting interest in the search for ceramic clay, in addition to which he helped the local brick and tile fabricators greatly by identifying clay minerals and locating suitable sources of raw materials.

He was also involved in the postwar search for uranium in the west, but most of his work in this field was in the identification of minerals for the many prospectors who asked his help at the University. He was ever generous in giving time to those who sought him out. Bronson's keen interest in the development of the mineral potential of Utah led him to spend nearly all the time he could spare from teaching during his last ten years in adding to our knowledge of areas where either metallics or nonmetallics might be developed in that state. He contributed much to the new geologic map of Utah and carefully studied alterations zones that might be related to potential mineral deposits. His last study of this sort, a comprehensive study of the economic geology of the Rocky Range near Milford was almost completed at the time of his death and this paper is now being completed for publication by the Utah Geological and Mineralogical Survey.

His field studies took him to every part of Utah and he and his battered old jeep with its homemade panel top were known in every corner of the state. The jeep and its driver became legendary; although Bronson might show a touch of claustrophobia underground, any miner who might feel slightly supercilious concerning his reluctance to venture into ancient stopes with bad backs was likely to be terrorized as a companion on one of Bronson's jeep trips through the box canyon country of southern Utah or atop rocky ridges and along improbable slopes where he unhesitatingly drove his ancient vehicle. Such rides were accompanied with pithy geologic comment and humorous anecdotes bubbling forth largely unappreciated by the frightened passengers, however. Nevertheless his field trips with his students and colleagues were highly prized though stren-

uous excursions. He came to know the geology and mineralogy of Utah intimately and each year made his ability to contribute to the mineralogical and geological literature of this state more impressive. His knowledge of the geology of Utah, which began with his work in southern Utah under Gregory, became increasingly comprehensive and he made many excellent contributions to our knowledge of that state, both its mineralogy and its geology.

Each year he took students on extended field trips during which their respect for their mineralogy professor increased as they realized the breadth of this man's knowledge of the structural and economic geology of the state. Although he occasionally enjoyed a convivial evening with students on field trips, he would tolerate no hanky-panky and had a rather old-fashioned idea about the behavior of his group; I know of at least one occasion on which he summarily dismissed a student for overstepping the rules of propriety—perhaps part of the reason that Bronson and his field trips were always welcomed in the small towns and mining camps of Utah. He had a deep sense of responsibility for the education of students in his field and this feeling of obligation resulted in his donating time to them to a much greater extent than required; during the days when geology enrollments were so heavy in the post World War II period he habitually conducted petrographic laboratory sessions not only all during the day but during the evenings and Saturday also, in order to make the useable microscopes go round, and students of those days will especially remember this man's generous giving of himself to those working under him.

As a teacher Bronson was both informal and exacting. He had a deep interest in his students which was appreciated by them and no student went through his courses without acquiring a vivid and lasting memory of Professor Stringham as a friend and teacher. His ability to recall the names of his students was phenomenal. Even with large classes he generally knew every person in it by the third meeting, and could recall their names when he met them years later. His knowledge of the students taking advanced work with him extended far beyond the mere matter of names and he had a personal interest in them and their careers, their family, their triumphs and their hardships throughout their subsequent life.

The ability to kindle enthusiasm for his subject, an intense interest in the student and his welfare, a love of good scholarship and an ability to communicate, made him a man who will long be remembered by his students for those qualities that make a great teacher.

His lectures seemed informal enough—spiced with anecdotes but the meat was there and a give and take of questions quickly yielded shrewd appraisal. He loved to “kid” students and colleagues alike, and for the

most part with a gentle and kindly wit, and if on occasion he could use his tongue as a sort of verbal rapier the prick of which would draw blood—always he was more than ready to bind up such wounds. Withall Bronson was basically a sweet, gentle soul, generous with his time and help: a man whose passing leaves his family and immediate friends with a deep and lasting sense of loss.

Although a Bronson Stringham Memorial Scholarship Fund in Mineralogy has been established at the University of Utah to honor his memory; his real memorial will be what he passed on to his many devoted students and gave to his colleagues and friends during a thoroughly unselfish lifetime. His continuing contributions—mineralogical, geological, and personal—to the State of Utah will be greatly missed.

Bronson Stringham was a dynamic affable man whose outstanding characteristic was his love of the good things of life, which I believe he would have defined as family, friends, field work, teaching, research, good food and good stories. He relished them all! It must have been a man like Bronson that inspired the proverb "A merry heart doeth good like a medicine." He loved his family, he loved his friends, and he loved any occasion for merriment. We will miss his genial smile and bubbling laugh.

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## MEMORIAL OF HAROLD DOUGLAS WRIGHT

November 11, 1921-July 7, 1969

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Harold Douglas Wright, professor of mineralogy in the Department of Geochemistry and Mineralogy at The Pennsylvania State University, passed away at the age of 47 at his home in State College, Pennsylvania on July 7, 1969 after several years of failing health.

For 19 years he served hundreds of Penn State students as their professor in courses in mineralogy, optical crystallography, and radioactivity in geologic settings. His graduate students enjoyed a close relationship with him and will always remember and admire him. He was serious yet had a subtle sense of humor; reserved, yet never distant or uncommunicative; meticulous, yet not overdemanding; conservative, yet always ready to accept new challenges. Students and colleagues respected him for his integrity, his frankness, and his dignified, friendly manner.

He was born the younger son of Frank James and Anna Zigler Wright on November 11, 1921 at Bridgewater, Virginia. Frank Wright was a geomorphologist who, as a graduate student, had studied under Douglas Johnson at Columbia University. Over the years there developed a life-