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Editor's note: Jewell Glass always devoted a deep and unselfish interest to the affairs of the Mineralogical Society of America. And now the Society has been informed that it is the residuary legatee of her estate, in an unrestricted bequest.

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MEMORIAL OF CHARLES DAVIS JEFFRIES

THOMAS F. BATES, *Science Adviser, Department of the Interior and* LEON J. JOHNSON, *Department of Agronomy, The Pennsylvania State University.*

Charles Davis Jeffries, Professor Emeritus of Soil Technology and a pioneer in the application of mineralogical principles and methods to the study of soils, died December 23, 1965. He retired July 1, 1961 from the staff of The Pennsylvania State University where he had served as a member of the faculty for forty-two years.

Dr. Jeffries was born April 19, 1896 in Uniontown, Pennsylvania. He received the B.S. degree in 1919, and the M.S. in 1922 in Agricultural and Biological Chemistry from The Pennsylvania State College. After receiving his B.S., he worked for eight years in the Institute of Animal Nutrition at Penn State on a program determining the nutritional value of animal feeds by use of the Armsby animal respiration calorimeter located at this institution. In 1927 he transferred to the Department of Agronomy where his interests soon became focused on the mineralogy of soils and the interrelationships of their composition and texture with genesis and fertility. With the new interests came the realization that further training in Mineralogy was needed. Consequently, with the encouragement and support of his close friend and colleague, Arthur P. Honess, Professor of Mineralogy at Penn State, in 1934 he again assumed the role of graduate student, this time at the University of Wisconsin.

CHARLES DAVIS JEFFRIES

Here, under the tutelage of Emil Truog, R. C. Emmons, and other members of the faculities of the Soils and Geology Departments, he earned his Ph.D. in Soil Chemistry and Mineralogy in 1936 at the age of 40. Returning to Penn State, he attained the rank of Professor in 1945 and rapidly established his reputation as one of this country's leading soil mineralogists. His career thereafter was punctuated by various assignments at other institutions including that of Visiting Soil Scientist, University of Puerto Rico (Feb.-March 1943; Feb.-May, 1950); Visiting Professor of Soils, University of Wisconsin (January-July, 1946); Visiting Professor and Lecturer, State College of Washington (1951); and Visiting Professor, Council of Scientific Research, Jamaica, W. I. (1961).

C. D. Jeffries was a leader in the application of mineralogical methods to soil problems. He quickly recognized the potential of the petrographic microscope and applied his experience in the use of the universal stage to the study of heavy minerals. His investigations of the mineralogical composition of the sand fraction led to the development in 1951 of a double centrifuge tube for the separation of soil minerals by the use of heavy liquids, and of a method for mounting the sand and silt fractions for petrographic analysis. In 1946, he introduced a modified rapid method for the removal of iron oxide stains to enable more accurate microscopic determination of the mineral constituents. In collaboration with C. E. Marshall, he demonstrated the general utility of heavy mineral composition and frequency distribution as criteria in the correlation of soil series and parent materials, and in the evaluation of the amount and degree of weathering.

Detailed studies of sand and silt fractions made evident the need for similarly critical evaluation of the role played by the clay minerals in determining soil properties and use. Consequently, Jeffries turned to X-ray diffraction techniques and used them effectively to help elucidate such relationships as that of mica weathering and potassium fixation. The studies he and his students pursued during the 1950's provided concepts and criteria of unique utility for the interpretation of soil weathering phenomena and the role clay minerals play in determining potassium fertility. Subsequent research on the frequency distribution of feldspar minerals in the sand fraction of the same soils led to the observation that low potassium-fixing clays and above average feldspar content are related to the ability of soils to sustain intensive agricultural use over extensive periods of time.

Dr. Jeffries became a Fellow of the American Society of Agronomy in 1948, of the Mineralogical Society of America in 1950, and of the American Association for the Advancement of Science in 1951. His participation in the conduct and activities of the Soil Science Society of

America appropriately reflect his professional interests and talents for he served at one time or another as Chairman of the Soil Chemistry Section, co-chairman of the Committee on Chemical Analysis, vice-chairman of the Committee on Soil Mineral Analysis Methods, and member of the Committee on Physical Analysis. He was a Consulting Editor of Soil Science from 1947 until his death and served as an abstractor for Mineralogical Abstracts from 1958 on. In 1951 he was a member of the National Soil and Fertilizer Research Committee of the United States Department of Agriculture. From 1953 to 1958 he was chairman of the Northeast Potash Committee. He was a member of the International Soil Science Society, the Mineralogical Society of London, the Clay Minerals Group of England, and the American Society for Testing Materials. He also belonged to a number of honorary societies.

Jeff was a friendly and gregarious person who could fit comfortably into any group, be it of students, professors, or "townspeople." His teaching was especially effective because it was by example. His talents with the microscope, universal stage, and as an accomplished silicate analyst served as modestly demonstrated challenges for both colleagues and graduate students to attempt to meet. He was always a strong advocate of "knowing what your are working with" chemically and mineralogically. Critical of himself, he was tolerant, patient, yet also demanding of his students. He lived, as he taught, with enthusiasm.

An avid sportsman, he had fished and hunted in most of the streams and mountains of central and northwestern Pennsylvania. Athletic prowess, which he demonstrated in football in high school and track in college, showed up in later years in golf and bowling scores of which he could be rightfully proud. He maintained an active interest in the affairs of his social fraternity and as a Mason attained the rank of 32nd degree.

He is survived by his wife, Florence and two daughters, Janet (Mrs. Robert Blind) and Carol. Janet was married in 1964 and is presently residing in Pittsburgh, Pa. Carol attended the University of Wisconsin and is presently a student at The Pennsylvania State University.