X-Ray Spectrographic Analysis Used In Soil Genesis Studies

The X-ray spectrograph has been used at the University of Illinois since the fall of 1958 to help evaluate some aspects of soil genesis. Doctor A.H. Beavers is in charge of this line of research and has spent considerable time developing suitable X-ray spectrographic techniques.

Analysis of the secondary X-rays produced when a soil sample is bombarded with primary X-radiation enables one to determine quantities of various elements in a soil sample when compared to suitable standards. Some elements occurring in soils which are easily determined are Fe, Mn, Sr, Ti, Rb, Zn, Cu, Zr, Ca, and K. Analysis of the lower atomic number elements, such as Si, Al, and Mg may be determined but the secondary radiation emitted from these elements is so weak that considerable difficulty is encountered without the use of special helium and/or vacuum paths, and different analyzing crystals.

The results from this type of analysis have been very helpful in determining soil differences due to weathering and also to determine varying degrees of similarity or dissimilarity of parent materials.

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REVIEWS AND QUOTATIONS

"Information on the cation-exchange capacity of many different soils is available in the literature but these data have never been assembled in a map, while information on the variation of cation-exchange capacity with depth is not at all readily available." (C.W. Thornthwaite, J.C. Mather, J.K. Nakamura, "Movement of Radio-

strontium in Soils", SCIENCE, April 8, 1960, Vol. 131, No. 3406)

EXTENSIONS OF ILLUVIAL CLAY-ENRICHED B HORIZONS IN SUBSTRATA

"When workers find soil B horizon-like material on sand and gravel beneath calcareous till, or other material beyond drift regions, evidence for a connection with the present surface soils through cracks and joints should be sought. It is essential, also, to find at least a remnant of an A horizon in position before such zones are finally identified as paleosols and given stratigraphic status." (from A. M. Gooding and B. Gamble, "Leached, clay-enriched zones in post-Sangamon drift in southwestern Ohio and southeastern Indiana: new observations and data", Bull. G.S.A., Vol. 71, pp. 511-514, April, 1960)


Biographical Sketches of Your Editors: Don Post

I was born Oct. 24, 1936 on a farm in Darke County, Ohio which is located in west central Ohio. My home was only about 5 miles from the Indiana-OH state line so actually I was practically a Hoosier before coming to work in Indiana. The geology of my home area is one of a glaciated gently undulating till plain characterized by rather heavy clay till soils. The Morley catena is the soil name we attach to it today. Until nearly my 18th birthday I worked on my father's farm.

I entered Ohio State University in the school of Agriculture in the fall of 1957. My older brother was attending Ohio