

PEDOLOGIC AND GEOMORPHIC PROCESSES ON A PORTION
OF THE FARMDALIAN BURIED LANDSCAPE
IN KNOX COUNTY, ILLINOIS

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ABSTRACT

Two buried Pleistocene surfaces exposed near Victoria, Knox County, Illinois were examined for the purpose of relating horizontal changes in the paleosols to the catenary concept. Morphological characteristics (color, texture, etc.) as well as textural and clay mineralogical data were used to determine the relationship between the paleotopography and pedogenic-gradational processes formerly active on the buried surfaces. The existence of two separate buried paleocatenas is established.

A Sangamon paleosol developed in till has been moderately eroded down to the B horizon on a gentle slope of the paleosurface. This slope connects to a broad swale. Texture analysis suggests that the poorly-drained profile in the swale is not an accretion-gley. The swale is probably a portion of a low-order drainageway on an upland of the paleolandscape. Clay minerals having d-spacings of 7, 10, and 14\AA° are present in the Sangamon Soil and 14\AA° minerals become less abundant in the lowest position on the paleosurface, possibly due to differences in the moisture regime.

Catenary features in the overlying Roxana-Farmdale paleosol were inherited from the topography of the Sangamonian surface. The Roxana Silt, a thin, early Wisconsinan loess deposit, shows a significant increase of clay, coarse sand and pebbles in the swale of the Roxana-Farmdale paleosurface, caused by admixing of Sangamon and Roxana-derived colluvium with the loess. Clay minerals with a

14A^{O} d-spacing show a downslope decrease in the Roxana Silt. This may be due to the influence of Sangamon-derived colluvial clay in the Roxana, or, because the Sangamon catena shows a similar downslope pattern, to differential clay mineral weathering controlled by the paleotopography.

At the Victoria site, no good evidence was found for a Farmdalian weathering period separating the Roxana and Peoria loess units. Instead, the Roxana Silt shows incipient soil formation and catenary changes throughout its thickness, suggesting that pedogenic processes were significantly active during the Altonian period of slow loess deposition. The rate of deposition then gradually increased, evidenced by loess bands at the base of the Peoria Loess (Woodfordian Substage) overlain by essentially unweathered Peoria deposits.