WEATHERING CHARACTERISTICS OF LOESS ON CROWLEY'S RIDGE, ARKANSAS

An Abstract of a Thesis

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by

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ABSTRACT

A study of the weathering characteristics of Pleistocene loess sediments on Crowley's Ridge, Arkansas, was undertaken to 1) observe the sequence and character of weathering zones in the loess, 2) provide a viable interpretation of the age of the loess, and 3) demonstrate the spatial relationship between loess in the region with that in the Midwest. Descriptions of the pedologic characteristics of the loess at four sites--three with moderate (25 ft.) loess accumulations and one with thick (60 ft.) loess deposits--were made and texture analysis performed on samples from each site. Clay mineral analysis (x-ray diffraction) was conducted on samples from three of the sites to observe possible associations between mineralogical variations and other evidence of pedogenic activity.

Field characteristics and the results of texture analysis indicate the presence of the argillic horizon of a major paleosol developed in the basal loess. Overlying the paleosol is a loess unit with weak soil structure at the bottom, grading to massive in the upper part.

An inverse relationship between the amount of 17^{o}_{A} clay minerals and the degree of structural development was observed consistently at all sites.

The basal loess is interpreted as the equivalent of the Loveland Silt deposited during the Illinoian Stage of glaciation. A

Sangamon Soil, formed during the ensuing Sangamonian Interglacial Stage, is developed in the basal loess. The overlying Wisconsinan Stage loess displays no evidence of a significant Farmdalian (Mid-Wisconsinan) weathering period but, rather, reflects only an increasing rate of loess deposition throughout the Early and Mid-Wisconsinan period.