Proceedings of the Iowa Academy of Science

Volume 57 | Annual Issue Article 32

1950

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The literature concerning the Pleistocene deposits of Iowa does not mention the presence of a loess sheet younger than the Loveland loess and older than the Iowan loess. The writer is of the opinion that such a loess exists in Iowa. The following evidence is presented to substantiate this conclusion.

During the summer of 1948 the writer was engaged in a study of the Loveland formation of Iowa under the auspices of the Iowa Geological Survey. During the course of this investigation the presence of a post-Loveland and pre-Iowan loess was revealed in two exposures.

The first section studied is in the center of sec. 31, Magnolia twp., (T. 80 N., R. 43 W.), Harrison County. The loess is exposed in a deep road cut along Highway 127, west of the town of Magnolia, Iowa. A second exposure which revealed a similar stratigraphic sequence is located on Mill Creek in the NE¼ sec. 9, Grove twp., (T. 81 N., R. 40 W.), northwestern Shelby County.

The section near Magnolia, Iowa, exposes 8 to 10 feet of reddish brown Kansan (?) till, which has a weathering profile at the top. Lying on the till is about 5 feet of pink Loveland loess, with a weak soil profile at the top. The Loveland loess is overlain by 4 feet of chocolate brown, slightly calcareous loess. The material is dominantly silt. By mechanical analysis the major grade of approximately 52 per cent is 1/16-1/32 mm., size. A small amount of sand was noted between 1/4 and 1/16 mm. Less than 5 per cent of clay sizes was present in any single sample. At this exposure the brown color is pronounced, and small black carbonaceous specks are scattered throughout. This chocolate brown loess is overlain by the buff colored Iowan loess.

The post-Loveland pre-Iowan loess is sharply set off from the overlying and the underlying materials. The color distinction is clear, the older Loveland has a pink hue, the intermediate loess has a definite chocolate brown color, while the overlying Iowan loess is buff in color. The intermediate loess has a weak soil profile and rests on the soil profile of the Loveland thus standing out as a separate unit in the exposure. Both contacts are unconformable.

A large vertebra was taken from the intermediate or post-Love-

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land pre-Iowan loess. It was found in the loess about 12 inches below the contact with the overlying buff Iowan loess. It is very poorly preserved. Most of the external features are mutilated and positive identification is not possible but it is thought to be from a Bison. This fossil vertebra has a light encrustation of calcium carbonate around it. The vertebra probably served as a point of accumulation of secondarily concentrated calcium carbonate.

At the Mill Creek exposure in northwestern Shelby County unweathered Nebraskan till is exposed at the base, and is overlain by sands and gravels which grade upward into the overlying Sappa formation. The Sappa formation is overlain unconformably by the Loveland loess. The Loveland loess is separated from the Iowan loess by a 4 foot thickness of light brown loess, which is unconformable in its relations with the overlying and underlying material. A weak soil profile is developed on the post-Loveland pre-Iowan loess. This soil profile is not quite as distinct as is the soil developed on the Loveland loess or the present day soil on the Iowan loess.

A few bone fragments were collected from the upper part of the intermediate loess. These fragments are not identifiable because of their fragmentary nature.

The writer is of the opinion that the Loveland loess is Illinoian in age. (Mickelson, 1949) The intermediate loess occupies a position that includes the Sangamon interglacial interval and possibly the earliest Wisconsin glacial stage. It should be noted that Kay (1929) recognized the possibility that the Loveland loess may be divisible into two parts in western Iowa. He states:

> Since the Loveland loess of western Iowa was deposited within the interval of time during which both the pre-Illinoian and post-Illinoian loesses were laid down in the Illinoian drift area, it may well be that although the Loveland loess appears to be a single formation, in reality its lower part may be pre-Illinoian in age and only its upper part post-Illinoian in age; and it may be that a part of the Loveland of western Iowa was deposited during the Illinoian glacial stage.

The writer has been unable to find any reference to such a loess in Kay's published writings outside of the paper cited above.

The writer believes that the stratigraphic position and character of the loess described in the Magnolia and Mill Creek sections may be the equivalent of the Farmdale loess of Illinois as defined by Leighton. (1946)

Wascher, Humbert, and Cady (1947) have described a similar sequence of loess in the lower Mississippi Valley. They indicate that the stratigraphic section of loesses is composed of a lower Loveland loess, a Farmdale loess and the overlying Peorian loess.

A section which shows a similar succession of loesses is exposed near St. Charles, Missouri. These loesses are called Loveland for the lower, Farmdale for the intermediate, and Peorian for the upper, by Guy D. Smith and William Shrader. (Oral Communication)

The Farmdale loess is thought to be late Sangamon or early Wisconsin in age. (Horberg, 1949) The National Research Council Committee for the preparation of the Map of the Eolian Deposits of North America concur in this age assignment. (A. C. Trowbridge, Oral Communication)

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