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A LIGHT-COLORED ZONE OF SUBSOIL IN SOUTHERN IOWA

W. G. BAKER

In the excavations of the new primary road cuts during the past three years many cross-sections of the soils of southern Iowa have been exposed to view.

One zone of soil which is particularly noticeable occurs overlying the Kansan till. The zone is a light-colored layer and the leached or unleached loess, as the case may be rests upon it, while the gravels of the Kansan, with few exceptions lie under it. The reddish ferreto zone in connection with these gravels gives a contrast in colors which makes the light colored zone easy to distinguish in the cross-sections along many fresh road cuts. In all cuts examined the gravels and the upper part of the till show oxidation.

Alden and Leighton in an article on the Iowan Drift in the Annual Report of the Iowa Geological Survey for 1915, refer to an overlying loess-like clay in connection with the Kansan till in the Iowan drift area. They state that it appears to be a thin mantle of loess which has lost some of its typical characteristics as a result of leaching, weathering, vegetation and burrowing animals.

Dr. Geo. F. Kay in an abstract paper¹ refers to a mantle of loess-like clay on the slopes and divides of the Kansan drift, that have been brought by erosion below the level of the original plain. He further believes its deposition to be chiefly the result of weathering and wind action of the Kansan till during the time of erosion.

The writer has observed the light-colored layer of subsoil in many places in the Missouri, southern Iowa and Mississippian loessal areas of the state. Roughly, the southern half of the state would cover the observations.

The light colored subsoil layer varies from a few inches to four feet in depth. Wherever found it has always had a uniform depth for that particular road-cut. The layer appears level or sloping according to the change in topography of the Kansan till it overlies.

¹ Some Features of the Kansan Drift in Southern Iowa. Geological Society of America. Vol. 27.



Fig. 1. The light colored zone of subsoil lying between the loess and till in a road cut 5 miles southwest of Tama, Tama County, Iowa.



Fig. 2. The light colored zone of subsoil lying between the loess and the till two miles west of Afton, Union County, Iowa.

A mechanical soil analysis of the light colored subsoil layer and the overlying loess was determined by the U.S. Bureau of Soils method. Difficulty was experienced in securing a composite sample of the adjacent Kansan till. It is hoped an analysis can be made of it at a later date. The samples were taken on Primary Road No. 1 three miles south of Indianola, Warren County. The loess samples were taken close to the light colored layer of subsoil.

SEPARATIONS	LOESS PERCENTAGE	LIGHT COLORED LAYER PERCENTAGE
Fine gravel.....	—	1.3
Coarse sand.....	—	3.7
Medium sand.....	.23	6.3
Fine sand.....	.51	17.9
Very fine sand.....	36.2	32.4
Silt	29.6	20.2
Clay	33.1	19.1

Acidity tests made of the two soils show them to be slightly acid, which is an indication of leaching in both soils.

The absence of the fine gravels and coarse sands in the loess soil is a good indication that the light colored zone of subsoil did not come from the same origin as the loess-soil. There is less silt and clay in the light colored zone which is also an indication that it is not the result of leaching from the soil above.

The light colored zone also contains small fragments of granite, quartz, quartzite, chert, diorite, and greenstones. These are not found in the loess soils, but they are products of the boulder clay in the till beneath the light colored zone. Undoubtedly in origin it comes from the Kansan till and probably has a close relation to the gravels which generally underlie it.