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SOME PREGLACIAL SOILS.

BY J. A. UDDEN.

In the region south of the Wisconsin Driftless area an old soil is occasionally found under the Kansan drift, generally resting on the bed rock, and often associated with laminated water-bedded clay and other silt. It is exposed under a bluff of drift in the southern part of Muscatine, Iowa. The material is here dark brown in color, mottled with small black fragments of vegetable tissue. The upper part is a dark mucky clay. The whole bed is only two or three inches in thickness. It lies below what appears to be pre-Kansan drift. At Davenport, Iowa, a similar bed was uncovered in the grading of the river bluff on the east side of Eastern avenue. At this place it had a somewhat darker appearance, owing possibly to the fact that it had been less subject to recent leaching in the exposure made. At Rock Island, Ill., the same soil bed has been encountered in several wells which have been dug near the river bluff. One of these wells is near the crossing of Thirty-fifth street and Seventh avenue. The section penetrated by this well consisted of loess, apparently two sheets of till, silt, varying from a black muck to a grayish loess with small gasteropods, and then a greenish sticky clay containing fragments of the local bed-rock but apparently no archæan pebbles or boulders. This latter clay was some five feet in thickness and rested on the soft shales, or clays, of the coal measures. It seemed to be a residual material of preglacial age, lying undisturbed on a slope of the bed-rock. The silt and muck above it contained fragments of wood, one of which measured nearly two feet in length and several inches across. Silt of the same kind and in the same position, but oxidized and without fragments of wood, has been exposed in the grading of some of the streets near by. On Thirty-ninth street it contained the following fossils:

Helicina occulta Say (common).

Pupa alticola Ingersoll.

Pyramidula striatella Anthony.

Succinea avara Say.

Similar deposits, though without fossils, occur under the drift in the bluffs east of Cordova in Illinois, and in the northern part of the city of Clinton in Iowa. At the latter place they are finely laminated and are associated with a peaty or soil-like layer. A deposit which appears identical with the loess-like silt on Thirty-fifth street in Rock Island is found underlying the till on the east line of section 12, T. 17 N., and R. 1 W. south of the city, and also in a gully near the bluffs of the Mississippi river in the west end of the county on section 31, T. 16 N., R. 5 W. At the former place it rests on the coal measures and contains in about the same relative abundance the same fossils that were found in the silt exposed on Thirti-ninth street in the city. In the exposure in the west end of the county the underlying beds are not seen. The total thickness of the drift above it is about 100 feet. Shells are abundant and they are of the same kinds and of the same relative frequency as at the former place. The following species have been identified by Dr. W. H. Dall of the U. S. National museum:

Helicina occulta Say (abundant).

Helicodiscus lineatus Say.

Limnæa humilis Say.

Pupa armifera Say.

Pyramidula perspectiva Say.

Pyramidula striatella Anthony.

Strobitops labyrinthica Say.

Succinea avara Say.

Succinea luteola Gould.

Polygyra, sp.

Vitraea arborea Say.

These loess-like deposits have a bluish-green color in fresh exposures, but one season of weathering gives them a reddish-gray hue to the depth of one or two feet and then their resemblance to the loess in color, as well as in structure, is quite marked. Even the tubular ferruginous concretions of the latter deposit appear.

The precise relation of the soil beds to this deposit and to the laminated silts, with which it seems to be associated, and

the relation that the two latter have to each other can not be fully made out from the known exposures. In the well on Thirty-fifth street in Rock Island there seemed indeed to be two soil horizons. The section under the Kansan till was as follows, beginning above:

	FEET.
Black sticky muck with large fragments of wood..	4
Loess-like, ash-colored material with pulmonate fossils	8
Black muck.....	4
Residual clay full of local rock fragments.....	5
Coal measures.....	

All the fragments of wood found in the ancient soils belong to gymnosperms, and this may be regarded as indicating a boreal climate, such as would precede the advance of the ice. The position of the deposits under the till indicate that they are pre-Kansan in age, and possibly preglacial. The region in which they occur lies to the south of the Driftless area, where the abrasive work of the ice seems to have been small in amount. Erosion contours of two and three hundred feet in elevation lie buried under the drift in this region, and glacial scorings are unknown. Among such surroundings it would be more singular that preglacial surface deposits should be wholly absent than that they should occasionally come into view.