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# A Bignell(?) Loess Section in Western Iowa

By ROBERT V. RUHE

## INTRODUCTION

The Bignell loess was named and first described by Schultz and Stout (1945). At the type section of the Bignell formation, near Bignell, Lincoln County, Nebraska, the upper loess (Bignell) is separated from the Peorian loess by a prominent soil and overlain by a complex topsoil.

Condra, Reed, and Gordon (1947) have also described the Bignell loess. Various profile sections in this paper (figures 3, 7, 12 and 14) show that the Bignell loess is restricted to flood plains, terraces, and upland shoulders of the valleys of the eastern half of Nebraska.

Schultz and Stout (p. 243) have proposed the following correlation of the Bignell loess:

W-3 Mankato	Soil Y Bignell loess
Two Creeks forest bed	Soil X
W-2 Tazewell-Cary	
"Peorian"	"Peorian" cycle complex
W-1 Iowan	

Condra, Reed, and Gordon concur in this interpretation.

The Bignell loess has not been previously recognized in Iowa. The lack of a soil break in the buff loess of western and southwestern Iowa has been somewhat perplexing when one realizes that on the western side of the Missouri River valley in the vicinity of Blair, Nebraska, the soil separating the Bignell and Peorian loesses is well developed.

## SECTION IN WESTERN IOWA

In the SC SW $\frac{1}{4}$  sec. 8, T. 81N., R. 44W., Harrison County, Iowa a Bignell(?) - Peorian loess section is located. The loesses are exposed in a vertical face near the top of a bluff approximately 100 feet above the grade of the Pisgah road. A road cut at the base of this bluff shows Pleistocene sands and gravels; this road cut is located approximately two-tenths of a mile northeast of the intersection of the Pisgah road (county trunk D) and county trunk V.

The description of the section is as follows:

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>3. Bignell(?) loess : approximately<br/>                     Modern soil profile, 30 inches<br/>                     Buff, calcareous, well sorted loess, 10 feet<br/>                     Buff, calcareous, fossiliferous, well sorted loess, 12 feet</li> <li>2. Peorian loess : exposed<br/>                     Dark gray to black, slightly calcareous, well sorted<br/>                     silt (A horizon of buried soil profile), 12 inches<br/>                     Light gray to buff, heavier textured, leached silt<br/>                     (B horizon), 15 inches<br/>                     Buff, slightly calcareous, well sorted loess<br/>                     (C horizon), 9 inches</li> <li>1. Slump</li> </ol> | <p>Thickness<br/>24½ feet</p> <p>3 feet</p> |
|---|---|

An analysis of the clay and organic contents of the buried soil profile (Fig. 1) shows the horizon differentiation. Accumulation of organic material has occurred in the A horizon; slight alluviation of clay has occurred in the B horizon. There is secondary carbonate in the A horizon (from overlying calcareous loess); the B horizon is leached; the C horizon contains primary carbonate material.

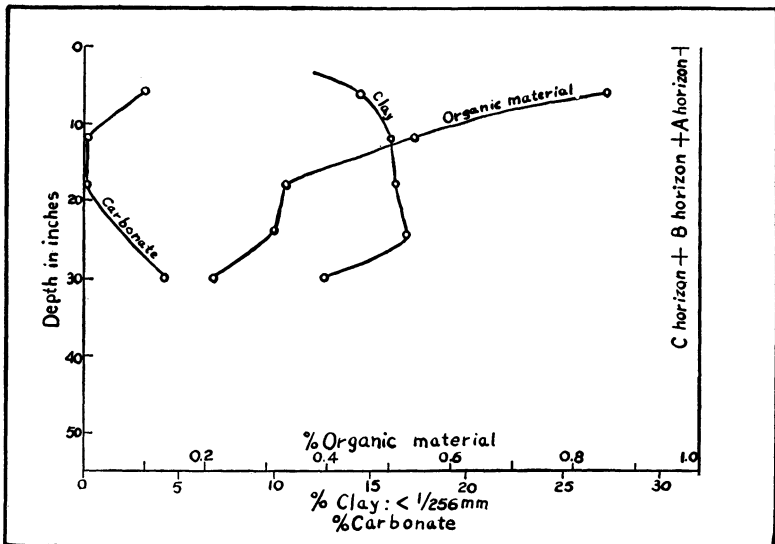


Fig. 1. Buried Soil "X" profile analysis.

A somewhat marked physical dissimilarity exists between the lower buff loess of this described section and the Loveland loess. The Loveland loess is exposed at several locations in the general area of the Pisgah road section; it is generally differentiated from the buff loess by its pink to red color and heavier mass texture.

The contact between the lower buff loess and the Loveland loess was not determined. A more detailed study of this area is necessary in order to show the exact stratigraphic relationship. The loess below the buried soil in the Pisgah road section, however, does not have the color or the texture characteristic of the Loveland loess in that area.

#### CONCLUSION

The similarity of the above described section to the Bignell type section, as described by Schultz and Stout, the observation by the writer of similar loess sections in eastern Nebraska which are designated as Bignell-Peorian, and the existence of the soil interbedded in buff loess, which has been previously recognized as Peorian loess, indicate that the loess overlying the buried soil in the Pisgah road section is probably Bignell loess.

#### Literature Cited

- Condra, G. E., Reed, E. C., and Gordon, E. D. 1947. Correlation of the Pleistocene deposits of Nebraska. Nebraska Geol. Survey Bull. 15, pp. 13, 33.
- Schultz, C. B. and Stout, T. M. 1945. Pleistocene loess deposits of Nebraska. Am. Jour. Sci., Vol. 243, pp. 241, 243.

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