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## Terranal Affinities of Iowa Chalks

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WATER-TABLE OF THE LÖESS

CHARLES KEYES

(*ABSTRACT*)

McGee, Calvin, Bain, Todd, and other Iowa geologists, repeatedly direct attention to the occurrence of an "iron streak" in many löess sections. No offer is made of an explanation of its possible origin. In recent, extensive, street-grading operations in Des Moines, clue is given to this phenomenon. It does not reveal itself usually in small exposures or in building excavations. But in long hill-side grades it is found to be the line of the old water-table, the level of phreatic waters, and, as shown by filled-up wells of the early settlers, to be the depth to which they had to dig in order to obtain their permanent water supplies for domestic purposes.

In a hill-side cutting passing through two till-sheets separated from each other by löess bed 20 feet thick, the iron-streak follows the contour of the sloping ground-surface, about 12 feet down, and thus cuts diagonally across all three deposits. This limonite streak appears to be due to the oxidation of the iron carbonate in the ground-waters at the surface of the latter. In places these ground-waters appear to have oscillated considerably, and in the löess to give rise to phenomenon of "stratified löess."

DES MOINES, IOWA.

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TERRANAL AFFINITIES OF IOWA CHALKS

CHARLES KEYES

(*ABSTRACT*)

With the larger perspective of the Cretaceous formations recently opened out to the west of us, between the Missouri River and the Rocky Mountains, the depositional relationships of our Iowa terranes take on new aspect. Above the basal Dakota sandstone, so well represented in our state, all of the great black-shale sequence, including the Benton, Pierre, Masuk and other similar divisions, is now regarded as a single provincial deposit, com-

prised under the title of Assiniboian series. Into this great body of black-shales extend from the shoreward margins huge wedges of terrigenous clastics; while from our side, the seaward side, appear limestones and chalks. Instead, then, of our being on the eastern shore of the one-time, broad, mediterranean sea, the present Iowa border of these deposits is really originally situated near the middle, and the Cretaceous waters extend far to the eastward, to the present Hudson Bay, and the far shore of present Lake Superior.

Thus a large proportion of our Cretaceous deposits, and especially our chalks, present itself in a new sedimental rôle.

DES MOINES, IOWA.

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## TAXONOMY OF IOWA'S GLACIAL DEPOSITS

CHARLES KEYES

(*ABSTRACT*)

From the angle of genesis we lately have to modify some of our ideas on our Glacial till-sheets. Realizing that the continental ice-masses do not emanate from a single center, it is found that our Iowa tills come from what is known as the Keewatin center, on the west of Hudson Bay; while the tills on the east side of the Mississippi River originated mainly from the Labradoran center. The only invasion of ice from the last mentioned center is a slight one by the Illinoian ice, in the extreme southeastern part of our state.

Belonging to the Keewatin province there are: (1) The Ashawan till, formerly usually designated as the Wisconsin drift, the latter name now being restricted to the tills on the east side of the Mississippi River; (2) Iowan till, and its Labradoran contemporary, the Illinoian till; (3) Kansan till, the tills going under this name on the east side of the Mississippi River probably being better designated by some such title as Indianan; (4) Adelphian till, its former title Nebraskan being a geological term preoccupied for a Tertiary formation widely represented to the west of us; (5) Itaskan till, which doubtless reaches southward about as far as the Ashawan till; (6) Moingonan till, recently discovered at Des Moines; and (7) Gravoisan till, which although not yet identified within the limits of Iowa, extends far into Missouri.

DES MOINES, IOWA.