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MOTION OF THE WISCONSIN ICE IN STORY COUNTY, IOWA

CHARLES S. GWYNNE

Recent inspection of airplane photograph maps of the area of the Wisconsin drift in Iowa discloses the presence of a pattern of narrow discontinuous bands in many parts. The entire map area is being studied in some detail but the pattern for Story County may now be described and some conclusions drawn.

The bands are formed by alternating light and dark streaks, (Fig. 1). Each streak is only a fraction of a mile in width, so that there may be as many as thirty of them in a mile. The light and dark streaks are not continuous for any great distance, but where they prevail the pattern formed by them stands out more or less clearly on the map, and may be traced in some cases for many miles across the county. The pattern is present over about two-thirds of the area; it is generally lacking from the eastern townships. The photograph has apparently reproduced a color difference of the earth's surface which in turn may in some way be the reflection of a topographic difference too slight to be shown on the quadrangle topographic maps and too slight to be recognized on the ground.

Close inspection of the individual contact prints from which the county map was made has led to the belief that the light parts of the bands represent slight elevations and the dark parts slight depressions. The differences in elevation are of course so slight that they would not show up, if it were a matter of difference in elevation only, on an airplane photograph. The streaks cannot be a reflection of differences in vegetation since they quite clearly extend across the fenced and cultivated fields. To the writer it would seem that they are the reflection of a slight difference in soil composition or texture. The dark ones, representing in general the swales of the ground moraine, have acquired a higher content of organic matter than the intervening swells. Their poorly drained condition through the years since the retreat of the ice has been responsible for this. The intervening swells, represented by the lighter parts of the bands, would have less organic matter and would have other soil differences, since they have had better drainage conditions and have been subject to more erosion during post-Wisconsin time.

There is also the possibility that the soil of the swells would dry out more quickly than that of the swales and that the camera has caught the resulting slight color difference. There is thus a possibility of the pattern showing up only under favorable conditions of soil moisture. The pattern may actually also be present where it does not show in the photographs.

Inspection of the map of Story County, (Fig. 2), shows bands of the pattern to be slightly curved and somewhat looped. They trend a little north of east in the northwest corner of the county and approximately northeast-southwest over most of the remainder but have a more northerly trend as the eastern townships, adjacent to the Wisconsin terminal moraine, are approached. The loops are concave northward. This all suggests parallelism of the bands with the position of the front of the retreating glacial ice. The pattern dies out as some of the larger valleys are approached and then picks up again on the other side, but with slight changes in curvature so that the bands form northward re-entrants on valleys such as those of Skunk River, Squaw Creek and Indian Creek.

The pattern is believed to be the result of a rhythmic pulsating movement in the retreating ice sheet, very probably related to seasonal changes. If this is the case it is possible that the pattern will throw light upon the rate of retreat of the Mankato lobe. In Story County the bands, each composed of light and dark streaks, average approximately fifteen per mile and if the bands are related to seasonal changes this would mean a rate of retreat across the county of about a mile in fifteen years.

The northward-pointing re-entrants formed where bands cross some of the larger valleys give the pattern a looped arrangement and show that the retreat was somewhat less rapid on the divide areas between the pre-Wisconsin valleys. The front of the ice as it withdrew was not, therefore, in the form of a uniform curve but was rather looped and there were re-entrants in the ice front coinciding with the major river valleys.

The bands extend across many of the morainic hills of the northern part of the county in a way which clearly suggests a lack of relationship between these hills and the Mankato lobe. The hills were considered by Beyer* to be part of the Gary moraine, but the extension of these bands across them would point to the possi-

* Beyer, S. W., *Geology of Story County: Iowa Geol. Survey, vol. 9, pp. 160-163, 1899.*

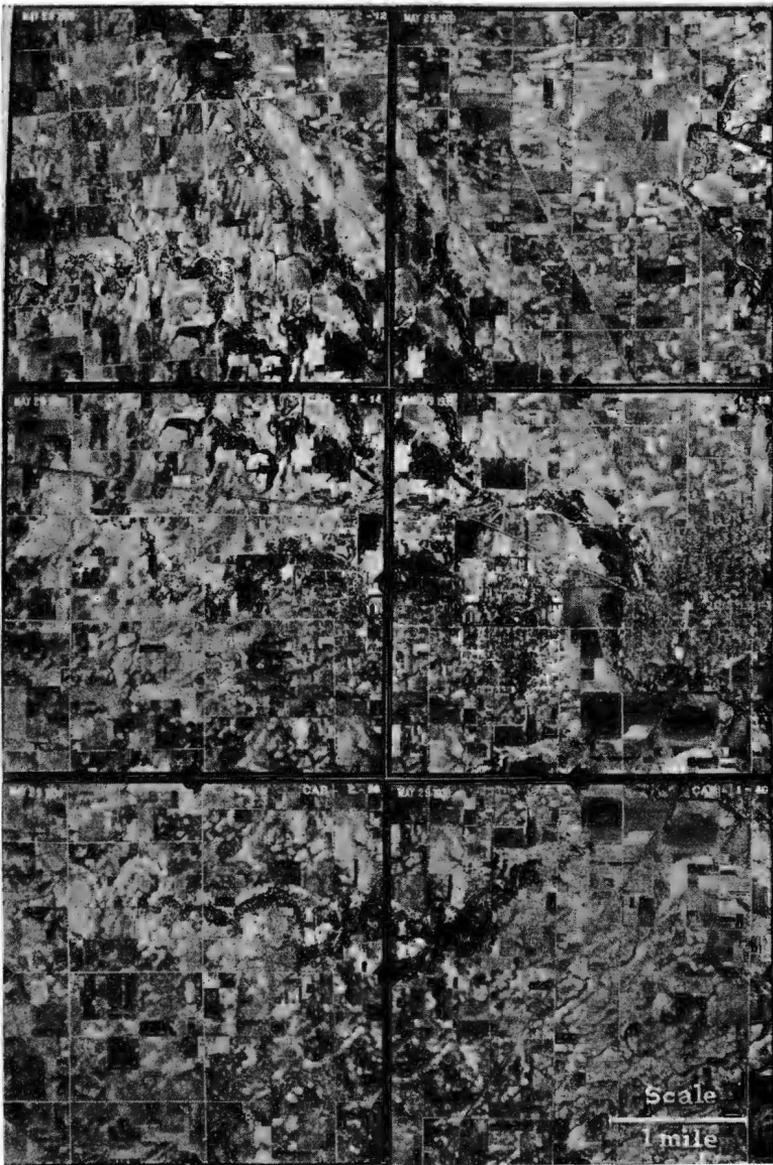


Fig. 1. Airplane photographs of the vicinity of Ames, Story Co., Iowa. Pattern is shown by light and dark streaks. Photographs used with the permission of the Agricultural Adjustment Administration.

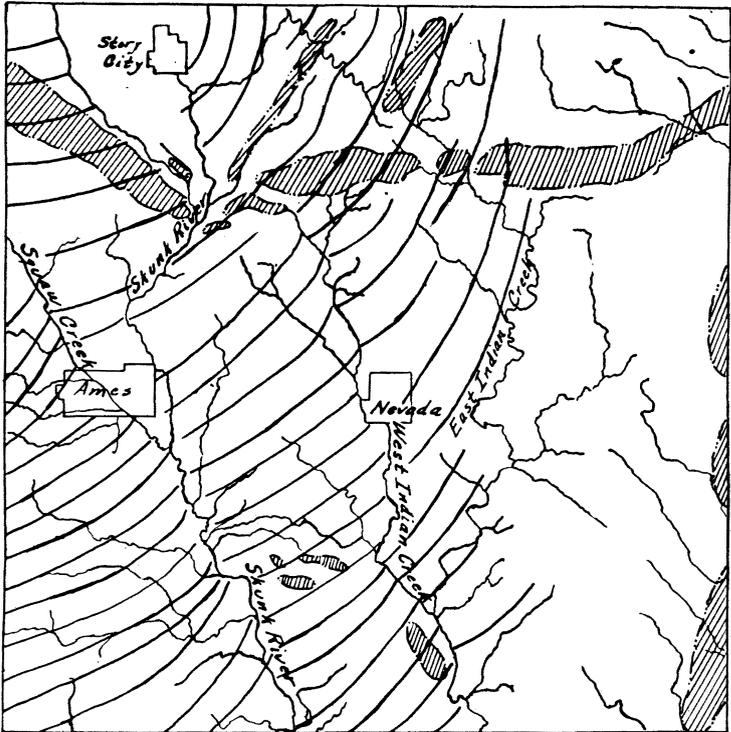


FIG. 2
SKETCH MAP, STORY COUNTY, IOWA
Showing Altamont and Gary moraines(?), lined areas;
and ground moraine pattern, approximate, sketched
from airplane photographic maps.
Scale $\overline{5 \text{ miles}}$

bility of their being buried morainic hills, possibly terminal, of an earlier glacier.**

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** L. W. Wood has often stated to the writer his belief that he could discern in the present surface of the Wisconsin drift area the reflection of a buried topography.