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INTRODUCTION

A deposit of peat located in a valley about a mile northeast of Ames, has been known for many years. It is rather unusual in that it lies along a small mature valley rather than in a swale of the upland. Investigation is believed to show that the deposit developed as the result of impounding of water by beaver dams.

DESCRIPTION

Location and topography: The deposit is located along two confluent valleys tributary to the Skunk River valley in the NW¼ of the NE¼ and the E½ of the NW¼ of Sec. 36, T. 84 N., R. 24 W., (Fig. 1).

The flat of the main valley (Fig. 2) has a width of approximately 150 feet where it merges with the Skunk River floodplain. It widens above to as much as 250 feet and then gradually narrows to 150 feet at its confluence with the tributary valley, three-eighths of a mile east. The flat of the tributary valley coming in from the north narrows upstream to a width of 100 feet at the end of the deposit. Beyond that it narrows further and gradually merges, within a short distance, with a weak drainage line of the upland. The valley flat is approximately 60 feet below the surrounding upland at the upper end of the peat deposit and 120 feet below it where it merges with the Skunk River floodplain. The valley sides slope gently at approximately 250 feet per mile. Other valleys tributary to the Skunk in this part of its course are similar to these described.

The flats of the valleys containing the peat deposits are generally smooth and with uniform slope except for certain exceptions to be noted. They are marked, however, by a deep trench which begins a few hundred feet above the lower end and continues almost the full length of the part of the valley occupied by the deposit. This has a maximum depth of nine feet in the middle of its course and decreases to six feet at the upper end. No other valley along this part of the Skunk River valley is marked by an incised channel of a depth comparable to the one described above.

As stated the valley flat has a generally uniform slope. Exceptions are found at three places, along the valley, at each of which there is a change in the slope noticeable to the eye (Fig. 3). Although the difference in gradient is small it is apparent that the profile of this part of the valley is one of sloping steps, each increasing somewhat in slope toward the upper end. Two of the breaks in slope are at narrow places in the tributary valley, one near the upper end and the other near the lower end. The third is a few hundred feet below the confluence with the tributary.

A circular mound fifteen feet in diameter rises approximately two feet above the surrounding flat (Fig. 4) near the lower end of the tributary valley. The upper part of this mound to a depth of a foot or more is a mixture of sand, clay, and organic material, but below that depth it is much more peaty. There is no nearby depression from which the material for this mound might have been excavated. A similar mound of more subdued character is found near the lower end of the main valley, on the north margin of the flat.

The remains of a man-made earthen dam rise a few feet above the valley flat near its point of confluence with the Skunk River floodplain. The presence of this and of the detritus which formed behind it has obviously changed and masked the earlier surface.

Description of peat. The deposit of peat as has been indicated lies along the course of these two valleys for a distance of approximately one-half mile. The width of the deposit has not been accurately determined but if it extends beneath the valley flat adjacent to the places where it is exposed in the incised channel, it is approximately 150 feet in width at the lower end and 100 feet at the upper end, where it merges with a small bog underlain by peat, and in which until recently, peat has been forming.

The peat and associated materials are exposed along the sides of the incised channel for much of the entire distance described, the peat to an average thickness of approximately eighteen inches and a maximum of three feet or more. The deposit ranges from pure peat to earthy material, clay, silt or sand. Much of it is typical peat, made up of plant detritus ranging from the finest fragments up to decayed branches and trunks a few inches in diameter. Snail shells are abundant. Many bison bones and also a few of deer have been found. Wood fragments bearing the marks of rodent teeth are also reported to have been found and reported to Mr. George Hendrickson of Ames.

The peat of the lower valley is underlain chiefly by clayey and

silty material with only vague stratification. Some sand and fine gravel are present in a few places. The incised channel of the upper valley has cut through the alluvial deposits into the underlying glacial till to a depth of several feet in at least one place where the channel impinges on the side of the valley. The peat is practically at the surface over much of the area, elsewhere it is covered with a few or several inches of peaty soil. The latter is particularly the case in the lower part of the main valley, where the peat is also generally only a foot or so thick.

Headwater erosion of the incised channel has been very rapid over the past few or several years. The peat-forming bog has decreased in size until it is now only about 100 feet long whereas ten years ago it had a length of approximately 150 feet. The water-loving plants are slowly dying out as the bog continues to become better drained. Springs and seeps in the vicinity of the bog cause runoff in the channel during most years of normal runoff.

Adjacent valleys tributary to the Skunk River do not, so far as the writer has been able to discover, contain peat deposits.

Discussion

Origin of the peat. Deposits of peat can only have been formed in a body, large or small, of stagnant or nearly stagnant water. A shallow depression is necessary for the accumulation of such stagnant water. In this part of the world the depressions are commonly of two types of origin, either the result of glaciation or the fluvial processes operating on rather broad flood plains. Those of glacial origin are represented in northern Iowa by the depressions in the drift surface. Many of the larger of these depressions contain peat deposits formed since the Mankato stage of the Wisconsin glaciation. Others of smaller size contain soils with a higher content of organic matter.

The depressions formed by the fluxial processes are best represented by the ox-bow lakes formed by the cutting off of meanders. Depressions on flood plains may develop in other ways and they may range greatly in size. Those large enough to accumulate a deposit of peat could only develop on the flood plains and terraces of the larger streams.

This deposit which has been described is found along the course of a comparatively small valley, the valley flat of which is notable for its lack of irregularity except for the deeply incised

channel. It has, however, a steep downstream slope. It is obvious that there must have been obstructions across the valley in order to provide the conditions necessary for the accumulation of this peat deposit. There is no possibility of landslides having provided such obstruction. The valley is too wide, it is of insufficient depth, and the drift material does not slide in a manner such as to completely block even a small valley for any length of time.

There are several features which point to beaver dams as the barriers behind which the swampy conditions developed.

(1) The presence of the peat along the valley with a difference in elevation of approximately 50 feet between the lower and upper ends. Accumulation in this fashion might well develop behind obstructions placed at points higher and higher up the valleys. It is difficult to see how it could have developed in any other way.

(2) The step-like gradient of the upper part of the flat suggests the earlier presence of beaver dams.

(3) The low mounds are strongly suggestive of beaver houses or dens.

(4) The fine alluvium underlying much of the peat is material such as would accumulate in a beaver pond in its earlier stages, while the water was still deep.

(5) Beavers are known to have been native to this part of the country when it was settled, and there seems no reason why they might not have occupied this valley, particularly since it may have been spring-fed.

Ruedemann and Schoonmaker (1938) have described broad and flat alluvial plains as much as nine miles in length in the Schuylerville, Cohoes and Troy quadrangles in New York. They are ascribed to deposition behind beaver dams.

Summary. The peat deposit covers a sloping valley floor for a distance of approximately one-half mile to a width of as much as 250 feet. The peat grades to clayey, silty and sandy material containing much organic matter, and is underlain by several feet of generally fine alluvium. All the evidence points toward the development of this peat in a basin or basins partially enclosed by beaver dams.

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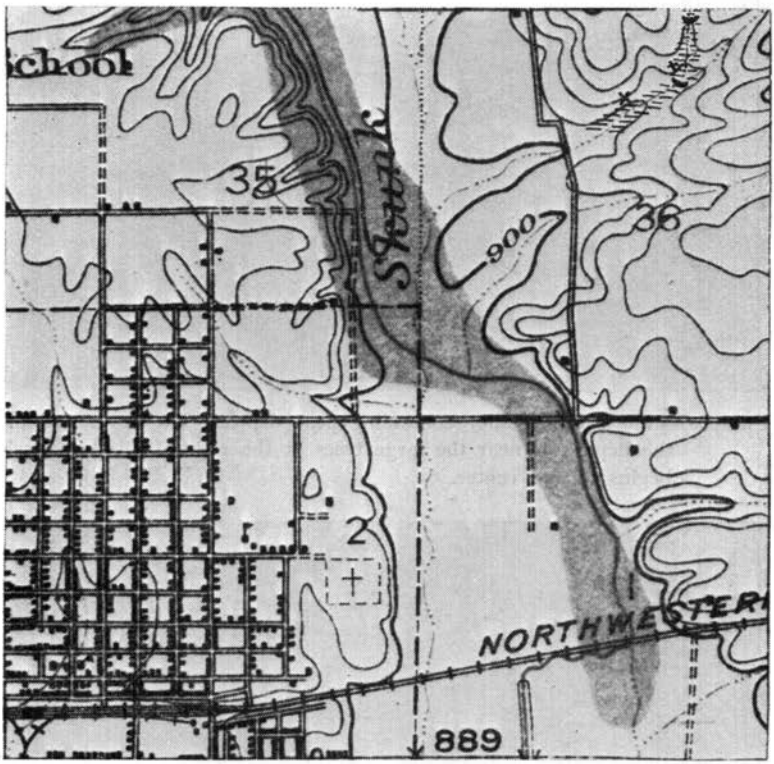

FIG. 1. Map showing location and features of peat deposit. Area of the deposit is shown by pattern of dashed lines, possible dams by heavy lines across the valley, possible beaver houses by crosses. Shaded area in Skunk River valley indicates forested area. Area is two miles square.

FIG. 2. View up the valley containing peat deposit. The lower end of the deposit is near the large trees at the right. Incised channel begins left of center.

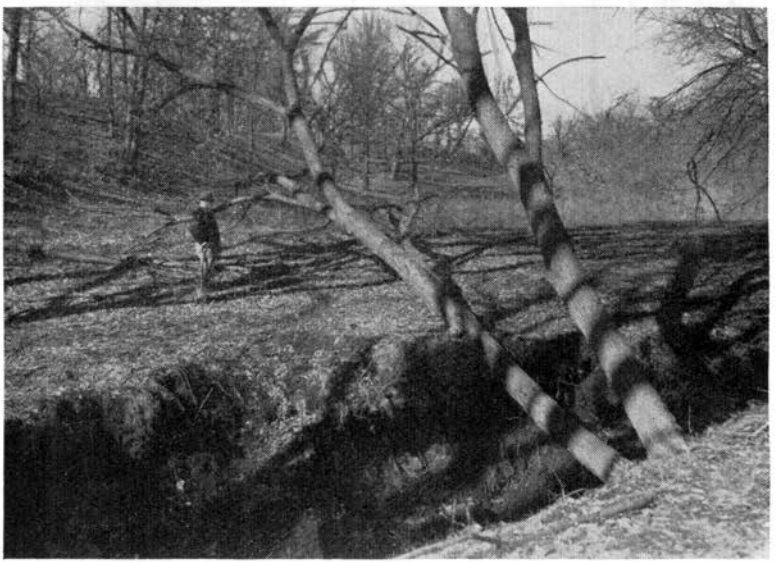

FIG. 3. Upper end of tributary valley. Beaver dam is suggested by noticeable change in gradient of valley floor. Incised channel in foreground, with peat exposed at top.

FIG. 4. Lower end of tributary valley. Mound at right is believed to have been site of beaver house. Valley floor is underlain with peat which is well exposed on the sides of the incised channel.