

REPORT OF VISIT TO SLEEPING BEAR DUNE AND ADJACENT AREAS

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22 October 1979

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Introduction. On October 12, 1979, at the invitation of Paul Thompson of Cranbrook Institute of Science, I visited several areas adjacent to the Sleeping Bear National Lakeshore property for the purposes of evaluating their potential interest as natural scenic areas. The areas visited are outlined on the attached copy of a portion of the Maple City topographic map.

"Juniper Ridge" and adjacent deep glacial valley. These features are located in Sec. 19, T.29 N., R.13 W., approximately 3 miles due east of Glen Arbor, MI. In the first place the views to the west from overlooks along the road on the west side of Sec. 19 provide excellent panoramas of Glen Lake and its geologic framework: the surrounding morainic hills, wave-cut scarps and channels associated with Glacial Lake Algonquin, and the complex barrier bar (where Glen Arbor is situated) that now separates Glen Lake from Lake Michigan. Although broad panoramas can be seen looking east from the Sleeping Bear area, these views looking west across Glen Lake toward the Sleeping Bear are very important for the visitor to conceptualize the geologic history of this area.

The deep "glacial valley" angling south-southeast through Sec. 19 is one of a number of sluiceways utilized by meltwaters pouring off the retreating ice sheet. This valley was carved while the front of the ice sheet was still filling the Glen Lake depression (see figures 8 and 9 of Drexler's report to NPS). In fact, it is likely that the ice front was standing just at the north end of the deep valley, about on the limit between sections 18 and 19, when the flood of meltwater rushed through it. Although such a valley may not be unique in this area, in terms of its origin, it is a spectacular example of such a feature and is of such a scale that it may be more readily assimilated and understood by park visitors than some of the other, larger meltwater channels. Geologically it is an outstanding example of the manner in which such a deep valley, obviously cut by flowing water, begins literally from "nothing", that is, it has no drainage basin to supply the water; a glacial source must be invoked.

Deep kettle hole. A remarkable example of a glacial kettle is found in Sec. 23, T.28 N., R.14 W., just about 2 miles due south of the south shore of Glen Lake. This kettle, formed by a large block of ice that, having been abandoned by the retreating ice sheet, melted away after the surrounding glacial drift had been deposited. In this case, the kettle is located at the limit between rough topography of the Manistee moraine and the head of the extensive meltwater outwash plain that spreads through sections 25, 26, 27, 34, 35, and 36 of this same township and beyond.

This is a classic kettle hole, almost a perfect cone somewhat

over 100 feet deep. Its abruptness and size can readily be appreciated by a visitor standing at its rim; in fact, if the NPS acquires the kettle, they should not allow visitors to climb down into it, which would trample the fragile vegetation and encourage slumping of the sandy sediment making up its walls.

This kettle is not unique in the area, although--as in the case of the glacial valley described above--its size and spectacular nature make it a prime example for the park visitor. Other kettles occur nearby, but not in the major areas of the Sleeping Bear National Lakeshore. Drexler (NPS report, p. 24) describes two other kettles, 1.5 and 2 miles north-northwest from this one in sections 14 and 15, respectively.

Bow Lake ice-block depression. This area located primarily in sections 8 and 17, T.28 N., R.13 W., is a complex depression formed by a mass of stagnant ice left over from the retreating ice sheet; in a sense it could be called a "kettle-hole complex". Bow Lake and the other small lakes and bogs occupy the deepest areas of the depression, probably the sites of individual ice blocks that remained in the area while the extensive meltwater plain southeast and southwest of here was being formed, i.e., the same outwash plain mentioned above in connection with the isolated kettle in Sec. 23. Although the Bow Lake depression opens northward into the east-west valley (a meltwater outlet channel: Drexler, Fig. 10) followed by the road through sections 4, 5 and 6, there is a low sill separating Bow and the other lakes from that east-west valley and, in fact, the water level of Bow Lake is clearly lower than the road level.

These facts plus the steep, irregular slopes and the boggy basins combine to give the Bow Lake area an unusual interest to the naturalists who may visit the park. Moreover, the lakes and bogs are lime-depositing basins. Gray calcareous marls with abundant whole and fragmentary shells of mussels and snails can be seen along the shorelines as well as constituting the floors of the flat inter-bog areas.

Conclusions. All the features and area described above are eminently worthy of preservation as examples of landforms produced by glaciation. All of them are of such a size and scale that they can be readily comprehended by park visitors, and they would constitute educationally valuable adjuncts to other glacial features already found in the Sleeping Bear National Lakeshore property.

Reference cited: Christopher Drexler, Geologic Report on Sleeping Bear Dune National Lakeshore, prepared at the University of Michigan, 52 p., 1975.

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