BIG MEADOW CHANNEL

THE IMPACT OF GLACIAL ICE INVASION ON DRAINAGE SYSTEMS

An Abstract of a Thesis

Presented to

the Department of Geography

Western Illinois University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

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May 1982

ABSTRACT

The nature of the natural drainage of the Galesburg Plain in west-central Illinois has been the subject of speculation since the turn of the century. Of particular interest was a valley known as Big Meadow Channel, extending in a nearly perfect straight line for 50 miles (80 km.) from Bushnell, Illinois to an area just east of the bluffs of the Mississippi River near the town of Sutter.

The alignment of this valley (S 65°W) corresponds very closely to several other channels within the Lamoine drainage basin, a condition suggesting that these valleys may have formed in response to similar contributing factors. Unique to Big Meadow Channel, however, is the apparent extension of the valley beyond the Lamoine drainage basin, across the divide that now separates drainage associated with the Illinois and Mississippi Rivers. While it appears that this might have been true of other valleys in this region, the exceptional magnitude of Big Meadow Channel clearly distinguishes it from adjacent valleys.

The objective of this investigation is to attempt to reconstruct the evolution of Big Meadow Channel based on the stratigraphic relationships of glacial deposits in and along the valley, the mineralogical composition of those deposits, and the geomorphic nature of the valleys comprising this system. It was found that upon examining these lines of

evidence independently, it was not possible to construct a defensible model of explanation. Viewed collectively, however, it was possible to develop a more comprehensive view of what occurred in the evolution of this valley and provided considerable insight concerning the unique Pleistocene geography of Western Illinois and the manner in which it has influenced the evolution of drainage in the region.

Based on the types of evidence cited above, it has been possible to arrive at the following conclusions:

1. That portion of the valley now referred to as Big Meadow was the site of a sluice that conveyed water across what is now the Illinois and Mississippi River divide during at least two distinct intervals of time.

2. Those intervals of time in which water was discharged through Big Meadow during the Pleistocene resulted from obstructed discharge due to glacial ice advance.

3. Waters issuing through the valley at Big Meadow were "reversed" following an interval of abandonment that coincided with the Yarmouthian interglacial.

4. Big Meadow served as a temporary nexus between two distinct watersheds that were established at least during, and probably prior to, the period conventionally assigned to the Kansan glaciation.