

AN INVESTIGATION OF THE DRAINAGE PATTERN IN THE
LAMOINE RIVER BASIN, WESTERN ILLINOIS

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ABSTRACT

The stream pattern in the Lamoine River basin in western Illinois exhibits components of dendritic drainage as well as controlled, rectangular drainage which would not normally be expected to develop upon the relatively thick, homogeneous Pleistocene deposits located in this area. An attempt was made to quantify the degree of drainage control in various sections of the basin and to investigate a number of important geomorphic agents that could have influenced the development of the stream network. A quantitative analysis was undertaken employing measures of bifurcation ratios, drainage frequency and density, and stream orientation in an attempt to delimit intra-basin variations in the geometry of the drainage network. This was followed by field and map analysis of Illinoian glacial movement, bedrock joint orientation, and buried bedrock topography. A comparison between these parameters and the present stream network suggests important relationships between bedrock joints, bedrock valleys, and the orientation of controlled drainage. A theory is proposed which states that pre-Pleistocene stream incision along joints in Paleozoic rock created valleys which influenced the controlled alignment of streams following the retreat of Pleistocene glaciers.