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### AN OPEN VALLEY NEAR HARRISBURG, OHIO.\*

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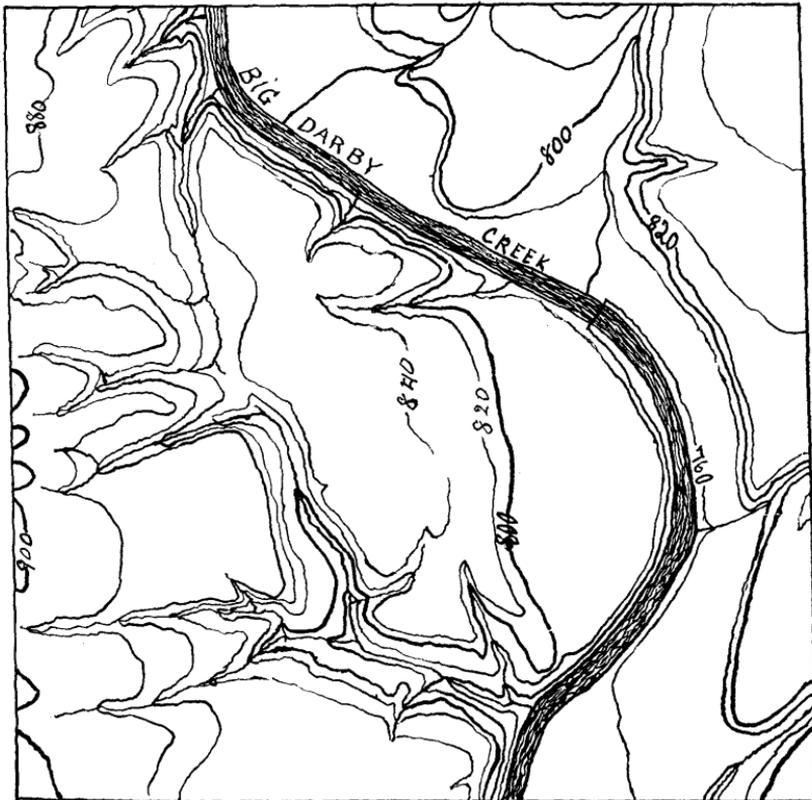
The subject under investigation is an open valley near Harrisburg, Ohio, on the B. & O. Railroad about fifteen miles southwest from Columbus. This valley at one end joins Big Darby valley near Harrisburg; at the other end after a circuitous course of about three miles on the west side of the creek it again joins Big Darby.

About a mile from the north end the water parts at present on a divide (see map) consisting of two small alluvial fans. The topographic map shows a small stream entering the valley at the divide from the west and flowing northward through the valley, but today this stream is buried in a tile drain and no stream nor channel can be found in this part except a very short one at the end of the valley.

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\* This paper covers a field problem worked out as a part of the course in Advanced Physiography given by Dr. George D. Hubbard at Ohio State University.

The southern part of the valley has a considerable stream, which in its lower course has cut deeply into the valley floor; leaving the old stream level as terraces above the present bed. The terraces at their down stream end are twenty-five to fifty feet above the present stream level but run out up stream. Similar terraces occur along the Big Darby, but in a number of instances the topographer in making the map has overlooked them, leaving them either on a level with the till plain; or, as in the case where this stream comes out to the Darby on the level with the flood plain.



0  $\frac{1}{2}$  1 Mile  
Contour interval 20 feet.

When one first enters this through valley he is struck by its size in proportion to the size of the present streams in it. Three facts lead him to believe that the present streams could not have carved the valley. First, these little streams would have needed

much more time than post-glacial time. Second, they do not act like the Big Darby and other streams in the neighborhood. As a general thing a stream here swings from one side to the other and undercuts the bluffs; but not so with this one. The third fact is, that the present streams are out of harmony with the size of the valley. These facts suggest that the present streams may have had little part in the formation of the valley, but are only the result of the present local rainfall. Did this region then at some previous period have a larger rainfall? And has the rainfall become less and so reduced the size of the stream? In answer to these questions it should be pointed out that other streams in the vicinity should show the same phenomenon. No such lack of harmony in size is found in any of the nearby streams. Thus we are forced to the conclusion that the valley was formed by other means than that of the present streams or the same enlarged by heavier precipitation.

Since the theory that the valley has been made by its present occupants seems to be untenable another hypothesis is proposed for its origin, namely, that it has been formed by the ice. At first this explanation looked very plausible but when one recalls that the surrounding country is a till plain from fifty to sixty feet higher than the valley floor one wonders why the ice in this particular course cut a deep channel and left the surrounding till plain smooth. We are unable to give a satisfactory answer to this question. Further, if the ice carved the valley it seems at least probable that the Darby would have used the ready-made channel.

There are several points which seem to indicate that the valley is really a stream valley even if the present streams did not produce it. These points may be summarized as follows: (1) The valley floor is nearly level across from one side to the other as all stream-made valleys are and not U-shaped like ice-made valleys. (2) The valley slopes are well graded and rounded at the top into the upland plain on either side which would not be the case in an ice-made valley. (3) A more certain proof that it is a stream-made valley is that its floor is composed of fine silt with no admixture of rocks. If it were an ice-made valley the floor of the valley would be of characteristic drift. Thus it appears that it is not made by ice but by a stream and that the streams found in it at present are not responsible for its formation.

There is a small stream entering this valley near its northern entrance to the Darby which possibly might have been responsible for this valley. This stream comes in from the west and cuts across the northern end of the valley and flows into the Darby through the valley's entrance into the same. But investigation shows that this stream is entirely too small to have been responsible for such a valley. A stream to have cut this valley must have

a larger valley and a broader valley floor upstream than has this little stream in question. Thus we conclude that it must have been made by a much larger and longer stream.

Another theory is that the Darby itself flowed through this valley at one stage of its development, and later changed its course for the present one. But the question arises, if the Darby had this valley for its course in some period of its history, why is the valley so much smaller than the present Darby valley? The Darby valley is from a quarter to one-half mile or even more in width, while the open valley is only one-eighth of a mile in width. Again, the Darby for many miles farther up its course has a much wider valley than this open valley. This width of the Darby valley north of the point where the open valley enters, opposes the idea that the river in some period of its history flowed through the open valley. So we must abandon that theory.

A further solution is proposed, namely, that at an early period in its history, perhaps while still under the ice, the Darby divided its course so that about one-third or one-fourth of its waters went through this present open valley, while the greater portion of the river flowed in its present channel. After time enough to make this valley, the eastern branch succeeded in cutting below the western and thus captured its waters. The open valley was thereby left as an abandoned channel of a portion of the Darby. The floor of this open valley at the point where it joins the Darby is about forty feet above the present level of the flood plain of the Darby. This shows how the Darby in its eastern branch was able to take the waters of the western branch.

These open valleys occur along the Scioto River in several places in its course and are attributed to the same cause as the one along the Darby. The division of the streams sometimes, no doubt, took place under the ice sheet during its last stages. Sometimes an island may have been the cause, separating the stream into parts and causing it to find two separate courses. In such cases the inter-stream area should be sandy.

This Big Darby valley has been abandoned long enough for the present northward stream to have graded a slope for its entrance into the Darby while the stream following southward down the slope once led by the old stream now has in its lower course a considerable flood plain some thirty or forty feet below the abandoned valley floor, leaving the old flood plain beautifully terraced as is that of the Darby itself.