

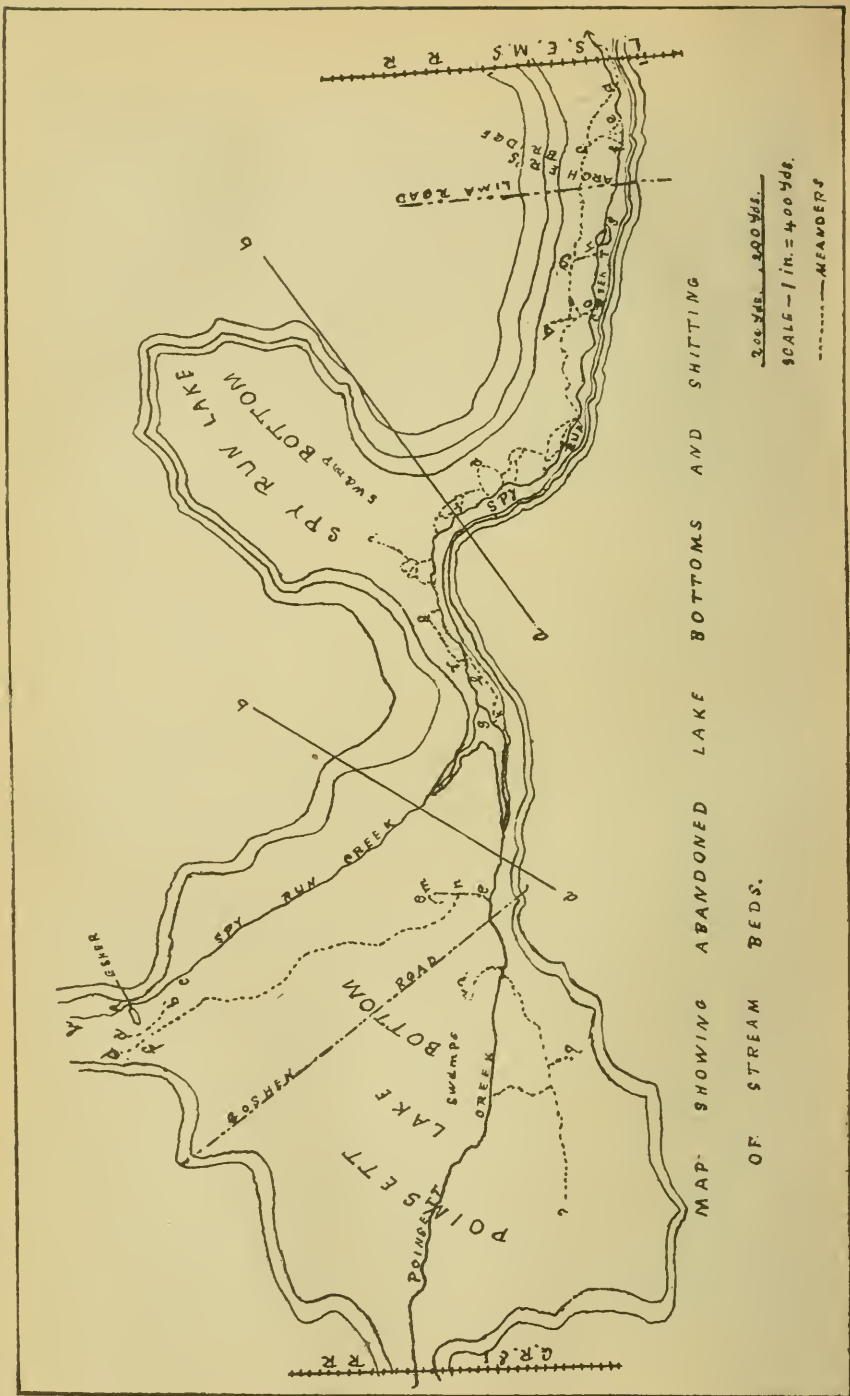
existence of glacial lakes has made favorable the conditions for man's occupancy. Maumee Lake basin, mentioned above, has a very rich soil, and yields some of the finest crops grown in the vicinity. Beyond the boundaries of our own State, and south of the line marking the farthest extension of the ice during the ice age, and south of lines marking periods of rest in its recession are many such basins; rivers were dammed, new lakes formed, and old ones enlarged, until to-day thousands of square miles of rich farming lands are found in the United States which would not otherwise have been here. The great wheat growing region and fine pasture lands of North Dakota are thus explained. "Such was the heritage which the great glacier of the ice age left as its parting gift, thus assuring the permanent prosperity of large and widespread regions of North America."

ABANDONED MEANDERS OF SPY RUN CREEK.

BY J. A. PRICE AND ALBERT SHAAF.

Spy Run Creek rises in the north central part of Washington Township, Allen County, and empties into the St. Mary's River, near Fort Wayne. It is a small, insignificant stream, but has, however, some noteworthy features, foremost of which is the marked shifting of its bed in and below Spy Run lake basin.

The head waters of this creek probably existed before the final retreat of the Erie ice lobe from the site of the first Erie moraine. The creek was dammed by the ice front, thus helping to form Spy Run Lake. The waters of the lake followed the ice in its gradual retreat and in this manner the lower extension of the creek was formed. At this time this part of the stream was probably much larger than at present. Its increased volume was due to the supply of water received from the lakes. It is impossible to say how long the stream was occupied in draining these lakes. At present, however, the stream has a well developed flood plain varying in width from two to three hundred yards. As a rule there are two or three annual overflows, during which time the waters cover a part or all of the flood plain. The depth of the water varies from six to eighteen or more inches. The strength of the current over the flooded area may be inferred from the fact that several years ago a rail fence



MAP SHOWING ABANDONED LAKE BOTTOMS AND SHITTING OF STREAM BEDS.

crossing the bottoms was carried away. As the waters disappear from the flood plain very little sediment is left behind, owing to the fact that at this time the lower parts of the old lake bottoms are covered with water which serves as a filter. If this were not the case the old meanders that are now found on the flood plain would doubtlessly be filled up.

An inspection of the accompanying map will reveal the complexity of these meanders. In Poinsett Lake bottom the complexity is less than in and below Spy Run Lake bottom. There is one long abandoned channel (*fe*) crossing the bottoms from north to south parallel to the present channel of the stream, and entering Poinsett Creek below Poinsett bridge. The north half of this channel is well defined, having a width of three to six feet and a depth of one to three feet. Its bottom and banks are covered with a heavy growth of underbrush. Its northern end gradually decreases and finally disappears; this may be due to the fact that this part of the basin has been longer under cultivation. One hundred and fifty yards south of the north end of channel *fe*, and twenty-five yards east, lies a portion of an old meander marked *ab*. This channel is probably younger than that part of *fe* indicated by *de*. The stream left the old channel at *d* and occupied *abeg*, a part of which, *eg*, is still occupied; channel *eg* has probably been straightened by man. North of *e* the present channel is artificial, cutting diagonally through the east end of an esker at *p*. This portion as far north as was examined seems to be very young. The channel through the esker is narrow, with steep sides about ten or twelve feet high. This esker is eight or ten feet high and about one hundred and twenty-five yards long; it was connected with the uplands at *p*. Channel *fe* connects with a short, crooked channel, marked *mn*, in the southeastern part of the basin. This channel marks the lowest part of the southeastern portion of the lake bottom and was probably the last part covered by the lake waters. This last fact is indicated by the crookedness and blind ending of the channel. Between points *e* and *g* there are two or three small meanders along Poinsett Creek not marked on the map. Two abandoned meanders are found between the lakes; one, *kl*, belongs to Poinsett Creek, and the others, *rs*, to Spy Run Creek. The former is very recent, the stream having been turned from its course by the artificial channel *kg*. Below point *l*, at the sharp turn in the creek, the bank on the east and convex side is steep and nearly perpendicular; on the opposite side a flood plain

is developing. In the southwest part of Spy Run Lake bottom occurs a complex system of old channels which indicate the part of the lake last drained. This is further shown by the more or less swampy condition of this part. Below the lake bottom the system of meanders is so complex that it is impossible to trace out, with any degree of certainty, the different stages which occurred in the shifting of the stream bed. Along the north side of the flood plain there is an old channel which seems to be the oldest in the system. Near the south side, where the stream is now located, the channels are less obscured, indicating that the creek has shifted its position from north to south and suggesting that probably the complex system of meanders is due to this migration. A number of cross channels connect the old channel on the north with the present one. In developing this system of meanders the stream may have followed channel *abc*, leaving it at *c* and entering its present channel, first at *d* and then at *e* and *f*. It then probably left the old channel at *g* and crossed to its present one by the cross channel *gh*, and at *b* by channel *bo*. Above this point the complexity increases, the meanders are smaller, with a greater number of cross channels. Four very young meanders lie south of the stream, one of which, *rs*, is at times occupied by part of the stream, forming a small island.

THE DEVELOPMENT OF THE WABASH DRAINAGE SYSTEM AND THE RECESSION OF THE ICE SHEET IN INDIANA.

BY W. A. MCBETH.

The development of the Wabash drainage system has now been worked out to such an extent as to show that it is not only a subject of interest in itself, but also has an important bearing on the question of the movement and recession of the North American ice sheet. The whole of the axial stream, except a few miles near its mouth and perhaps 30,000 of the 33,000 square miles comprised in its basin, were buried beneath the ice one or more times, and there is scarcely a tributary which does not show plainly the effects of the influence of the ice sheet in determining its course and its drainage area.

Along the line of the lower Wabash, the earlier ice approached within twelve or fifteen miles of the Ohio River, and almost to the limit of ice