

PRE-GLACIAL RIVER CHANNELS OF CENTRAL IOWA.*

BY CHARLES R. KEYES.

It is now a well established fact that the major drainage features of Iowa date back at least to late Tertiary times and that the main waterways were initiated upon an old Tertiary peneplain. In this region it is also clearly demonstrated that during glacial times the various ice lobes deflected in marked degree the courses of many of the streams. The recognition of pre-glacial valleys explains many otherwise unaccountable features which our present river valleys display. Some of the phenomena, to which attention has been here called, are found in central Iowa, especially in the vicinity of the city of Des Moines, and at this time are of exceptional interest. Geologically they are very important in their bearing upon the origin and history of certain of existing geographical characters.

During the past few years a large amount of exact information has been collected from various sources regarding these old river courses in Iowa. The pre-glacial channels in the vicinity of the present city of Des Moines come in for special attention for the reason that they have been so long misunderstood and have given rise to much unnecessary and unwarranted speculation among those who have not looked carefully into the geological aspects of the subject.

One of the most remarkable old channels of the Des Moines river, for instance, is the one which is now known to exist in the east part of the capital city. For a distance of four or five miles above the Raccoon Fork the present stream runs in a comparatively narrow, rock-bound gorge, which has long attracted notice. Both above and below this gorge the present valley of the Des Moines is several times as wide as it is in the gorge. A geological cross-section of this rock-

*The cuts used in this article are kindly loaned by the Iowa State Geological Survey.

bound gorge is represented below (Fig. 1). The steep bluffs and fresh rock ledges exposed in the sides of this part of the valley clearly suggest that the gorge is quite recent in origin

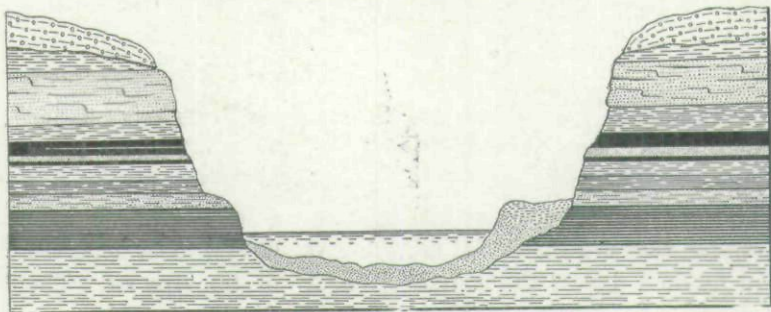


FIG. 1.

and that it was rapidly formed. There are many facts to which reference will be made later, going to show the inference to be the correct one.

East from Capital hill, a broad valley extends to the sharp Four Mile ridge. This valley is three or four miles in width. There is no running stream now occupying it. To the south this valley finally opens out into the broad valley of the present Des Moines river below the mouth of the gorge. To the northward the valley swings around to the west and merges with the Des Moines river valley again about opposite to the mouth of the Beaver creek, near the north end of the gorge. The course of this old valley and its relationships to the present Des Moines valley, the Beaver valley, and the Raccoon valley are perhaps more clearly indicated by the accompanying sketch map (Fig. 2).

In Capital hill and in Four Mile ridge the upper surface of the bedrock, although deeply covered by drift, is still at an elevation of about 75 feet above the broad valley between. But the bedrock in this valley is more than 100 feet beneath the present surface. This has been repeatedly proven in the coal mines which have been opened up northeast of the capital. In a number of cases the main coal seams to a depth of at about 90 feet have been cut off by old erosion channels, and subsequently filled with gravels and drift materials. On the east side of the valley the coal is again mined. Nu-

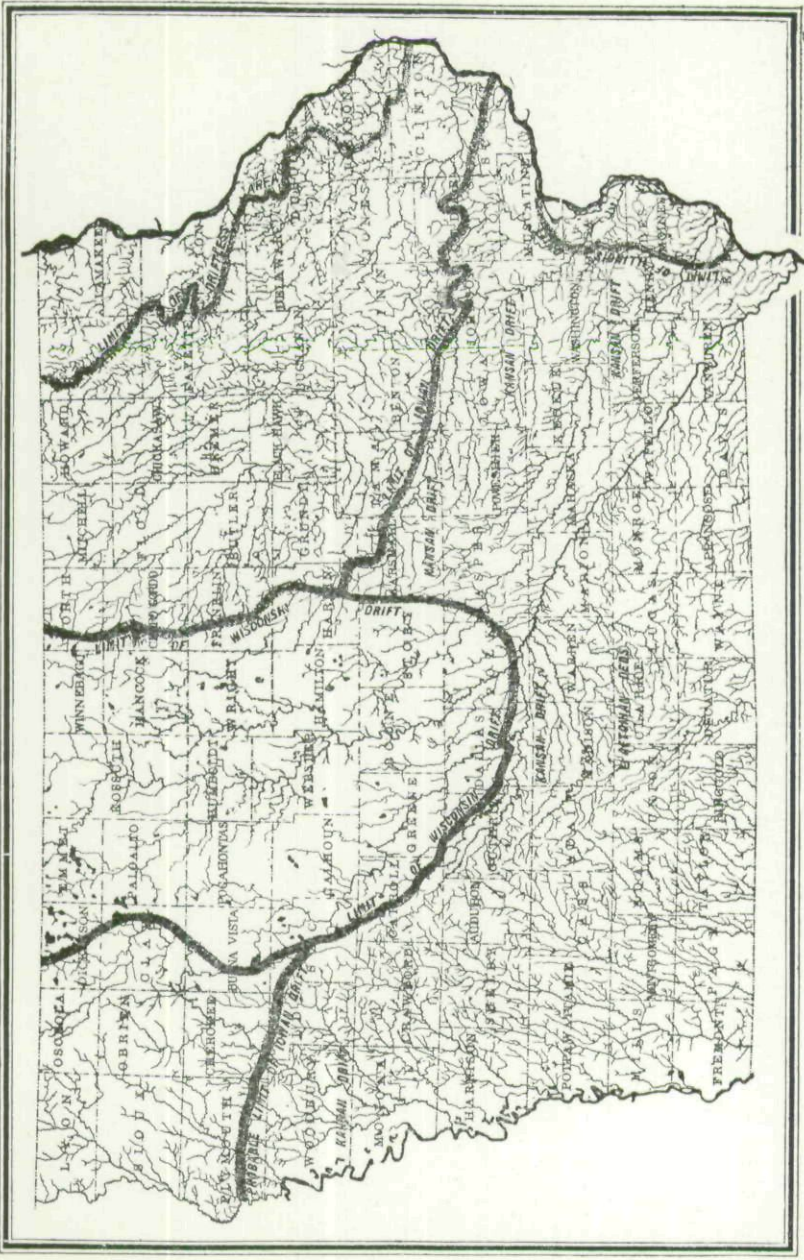


FIG. 3.

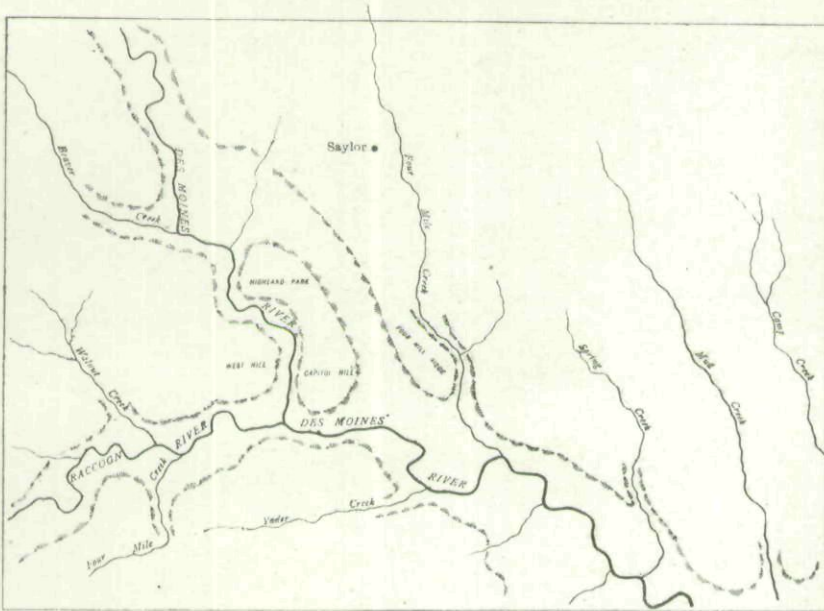


FIG. 2.

merous well records in the valley show conclusively that the drift deposits in the valley are 100 feet and more in thickness and that the rock-floor is to be found at about this level. These facts are also in accordance with similar observations made in the broad parts of the present Des Moines river valley above and below the gorge.

Beaver creek also flows along the line of a large pre-glacial channel, so large and deep that Dr. H. F. Bain, who has studied it in considerable detail, is almost inclined to regard it as an old course of the Des Moines river. This author says:

The Beaver valley shows topographic characteristics similar to those of the old valley just described. Its width is comparable to that of the latter valley, and if to it be added the width of the narrow valley occupied by the upper course of the Des Moines, the sum is about equal to the width of the Des Moines below the mouth of the Raccoon. The bottom of the Beaver valley is covered by the modified Wisconsin drift. Wells in this bottom land do not reach rock at depths of fifty feet. The side slopes show rare rock exposures, though the coal measures rise in them to heights considerably above the stream. At points undisturbed Kansan drift is found low down in the valley.

There is then a broad pre-glacial valley running across the country, now occupied in part by the Beaver, in part by the Des Moines and in

part unoccupied. For reasons to be considered later it is known that the course of the Des Moines above the mouth of the Beaver is much more recent, so this older valley may reasonably be considered to be that of the Des Moines. That the Raccoon river also flows in a pre-glacial valley seems well established. The topographic relationships, the drift-veneered sides, and the at least considerable filling up which it has undergone, all point to an age comparable to that of the Des Moines.

It is also quite possible that when the northern extension of this pre-glacial Beaver channel shall have been fully traced it will be found to be the old source of the north Raccoon river.

The manner in which the drainage lines may have been completely changed or modified by the later ice sheets is best shown by reference to the accompanying sketch map (Fig. 3).

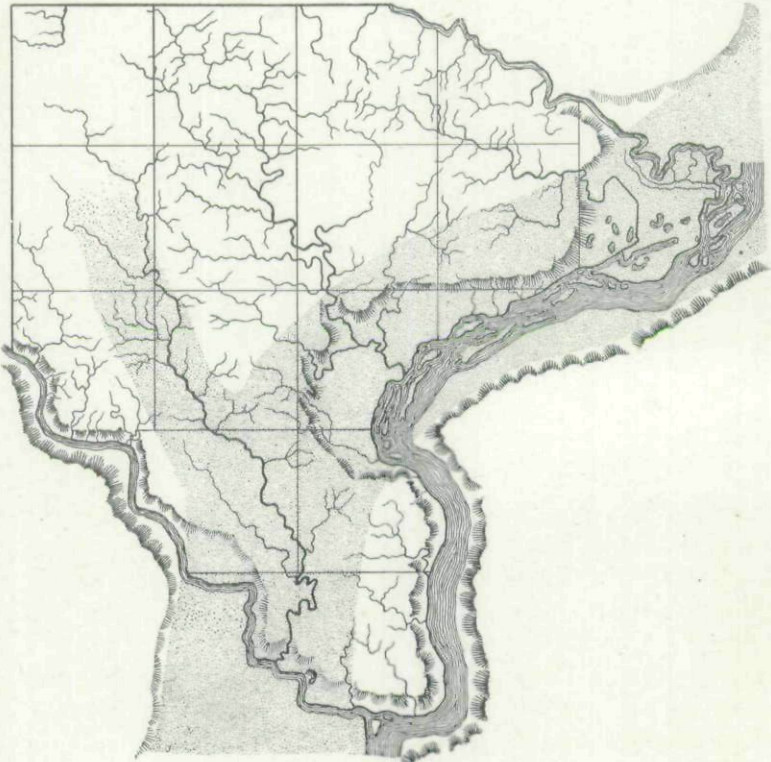


FIG. 4.

In this connection attention may be called to similar old channels of pre-glacial character at the mouth of the Des Moines river (Fig. 4).

The Mississippi river at Keokuk now flows in a very recent rock gorge whereas in pre-glacial times it flowed in a wide deep valley lying to the west of that city. The comparative magnitudes of the two valleys are indicated below (Fig. 5).

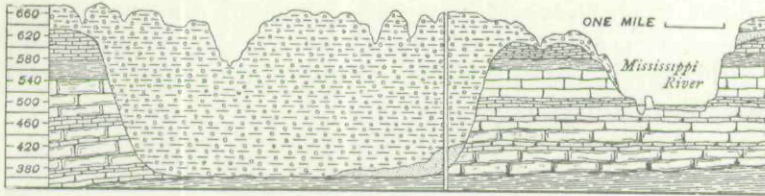


FIG. 5.

These facts were first brought out by Prof. C. H. Gordon and were subsequently fully corroborated by other geologists.

ENLARGING OF IOWA.—It is reported in the eastern papers that there was a movement on foot in Washington to enlarge our boundaries as a State by taking from Minnesota that portion of territory that lies between our western boundary and the Missouri river. It makes but little difference to Iowa whether it is annexed or not. If given, Iowa can take care of it, if not, she will make a State second to none without it.—*St. Charles City Intelligencer, April 9, 1857.*

THE WESTERN STAGE COMPANY is a great corporation, the most extensive, probably, in our State. The Company employ fifteen hundred men, and over three thousand horses, and own more than six hundred coaches. The capital invested is a million and a half of dollars. The field of their operations is in Iowa, Wisconsin, Missouri and Nebraska, and they are now running a regular line of stage to Fort Kearney, three hundred miles west of the Missouri.—*St. Charles City Intelligencer, Feb. 17, 1859.*

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