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THE PREGLACIAL ROCK RIVER VALLEY AS A SOURCE OF GROUND WATER FOR ROCKFORD

BY

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The Preglacial Rock River Valley as a Source of Groundwater for Rockford*

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Rockford obtains its water supply from deep wells penetrating rock formations from the St. Peter to the Mt. Simon sandstone. Being a large industrial city, Rockford requires a great quantity of water and it has been the constant study of the water department and engineers to keep up with increasing demands. Lowering of the hydrostatic levels of water in the various bedrock sandstones causes an increased effort to obtain an adequate supply by lowering the pumps or locating wells at widely separated intervals thus hurrying the time when the water level will be too low to allow further development along these lines. It is well, therefore, that the city look for possibilities of increasing their supplies from new sources. Such new sources of water supply are available in the sand-and-gravel filled preglacial valley of Rock River which lies close at hand.

The exact location of the preglacial Rock River valley throughout its length is still somewhat of a mystery. From Beloit to Rockford it is known to follow the course of the present valley. South of Rockford it continues in a southerly direction somewhere through eastern Ogle and Lee counties and southwestward toward the general vicinity of Princeton where it meets the preglacial valley of the Mississippi River.

In general, it can be stated that the preglacial Rock River valley from the northern State line to its junction with the preglacial Mississippi River valley is two to three or more miles in width. It was cut more than 350 feet below the upland in the northern portions and perhaps throughout its length in Illinois. The rock floor at Rockford is about 450 feet above sea level; at Princeton it is 323 feet above sea level, thus averaging a fall of 1.7 feet per mile in a distance of about 75 miles.

As determined from well records and outcrops, the accompanying map, figure 1, shows the major portion of the old valley in the vicinity of Rockford. The locations of wells which reached bedrock are indicated by the shaded areas. Contours are shown connecting points of equal elevation above sea level on the bedrock surface in the preglacial channel. For the sake of simplicity, contours above 700 feet above sea level are not given, for above approximately this elevation the bedrock surface reaches the present surface.

The preglacial valley below the 700-foot level has a width of about 2½ miles. It extends from the region of the present broad valley northeast of Rockford in a south-southwesterly direction to the present broad valley south of the city. In the east part of Rockford it underlies an undulating upland. The deepest part of the preglacial valley is shown in two wells to lie below 450 feet elevation. The data on wells in the southern part of the city would indicate that the valley is U-shaped, with a wide floor and steep sides. Very probably additional data on wells to the northeast would show this general shape continuing throughout the local extent of the valley.

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Outside of the main valley the old valley walls are deeply cut by tributaries and ravines, a suggestion of which is given in the contours on the western side of the channel. Closely spaced wells in Rockford west of Rock River show sharp differences of 50 feet in the elevation of the preglacial surface. Very probably the same type of irregularity is characteristic of the eastern valley wall and would be revealed by additional well data.

The preglacial Rock River valley carries a thick accumulation of sand and gravel. Wells in the present alluvial flats in the southern part of the city are reported to encounter sand and gravel at an elevation of 700 feet, beginning within 20 feet of the surface and to continue in these materials with an occasional variation of sandy clay or silt down to the

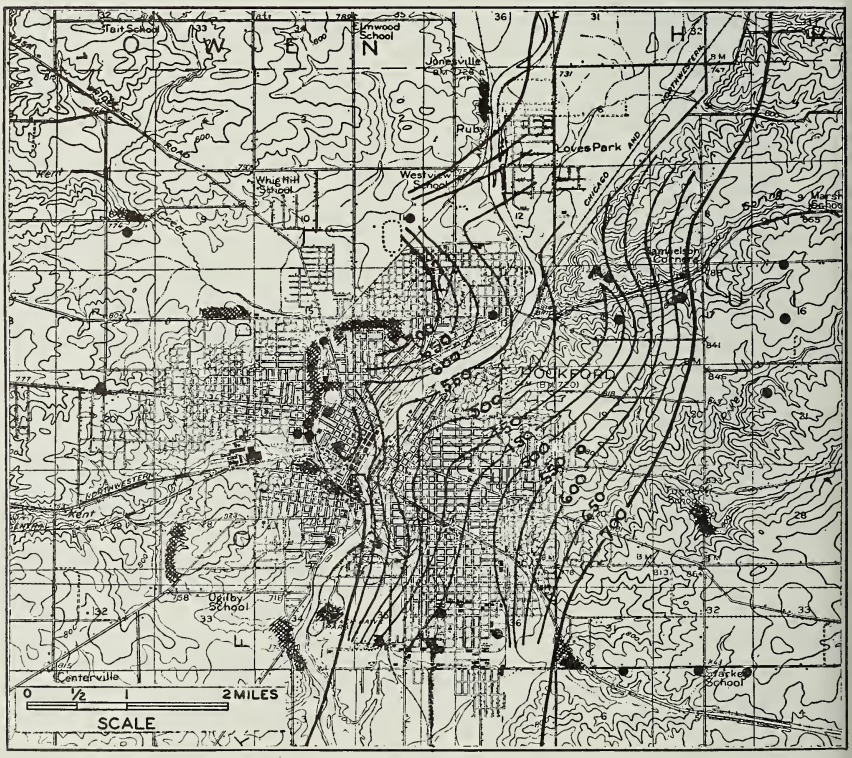

Fig. 1.—Preglacial Rock River Valley at Rockford.

Contour interval: 50 feet.

● Location of well reaching bedrock.
Bedrock outcrop.

bottom of the preglacial channel. To the north an illustration of the succession of glacial materials is shown in the following log of the Bradley Heights Sub-division well No. 2, drilled by P. E. Millis and Company, located at A, having a surface elevation of 840 feet above sea level.

Formation	Thickness	Depth
Pleistocene system		
Clay, gravelly, bluff, weathered	15	15
Gravel, clayey, yellow (may be gravelly till)	50	65
Sand and gravel, probably water-bearing	40	105
Clay, silty, brownish-gray	20	125
Sand, clayey, medium	15	140
Clay, silty, brownish-gray	25	165
Sand and gravel, water-bearing	45	210
Clay, silty, brownish-gray	10	220
Sand and gravel, water-bearing	55	275
Clay, brownish-gray	5	280
Till, gravelly, compact	55	335
Ordovician system		
St. Peter sandstone	below	335

Most of this drift, both glacial till and sand and gravel is probably of Illinoian age, although it is possible that the lowest 55 feet of compact till may be partly or entirely of pre-Illinoian age.

A number of wells which obtain large water supplies from sand and gravel in the preglacial channel are located in the south part of the city, and it is therefore logical that attention is drawn to that locality as a possible location for an additional supply for the city. A properly developed well there in the general vicinity of the middle of the old valley should supply a great abundance of water, a conservative estimate being 1,000 gallons per minute.

However, attention should be called to the possibility that a similar well can probably be developed at any other convenient location along the middle of the preglacial valley. A well located in the more elevated region east of the business district would have some added advantage in being more protected from local seepage of contaminating water by having an additional covering of compact materials, and, at the same time, it would be less likely to influence, or be influenced by, the industrial wells. Finally, a location presenting the least likehood of interference between wells, now and probably for a long time in the future, would be northeast of the city.