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GREEN COUNTY

by

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GREEN COUNTY

Monticello Farm District

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Topography

The highest elevation in the county is in section 1 of the Town of York, 1180 feet above sea level. The lowest elevation is along the Sugar River in section 13 of the Town of Spring Grove, about 760 feet. At Monticello, the elevation of the bench mark on the west side of Main Street, 140 feet south of the junction with Railroad Avenue, one foot east of the sidewalk, is 847.541 feet. About 12 miles north of the northwest corner of Green County are Blue Mounds. West Blue Mound rises to a height of 1716 feet above sea level and is the highest point in southern Wisconsin. This mound can be seen from many of the higher points in Green County.

Rock Formations

Beneath the surface at Monroe, granite is at a depth of about 1700 feet or 700 feet below sea level. The deepest well there is 1688 feet deep but did not reach granite. In Lee County, Illinois, about 60 miles south of the Wisconsin line, the pre-Cambrian surface is probably at a depth of 3,000 feet below sea level. From well records and rock exposures we know that granite is the rock underlying a large area in the northern part of the state. Overlying the granite elsewhere is a series of limestone, sandstone and shale beds over 2,000 feet in thickness. The granite and overlying beds have been arched into a broad fold with the axis trending north and south through the center of the state. As a result the beds dip gently eastward in the eastern part of the state, southward in the southern part, and westward in the

western part, much like the shingles on a roof except that the butt edges of these shingles project up the roof. During and following the uplift the rocks were subjected to a long period of erosion during which enormous quantities of rock were worn away so that none of the formations has as great an extent as formerly. Each formation in its recession left out-lying buttes and mesas which are like stragglers of a retreating army. Blue Mounds is an isolated outlier of the Niagara escarpment which is 70 miles to the east in Wisconsin, 45 to 55 miles to the south in Illinois and ^{western} Iowa. The Platte Mounds and the sandstone mounds near Camp Douglas are of similar origin. Deep valleys were cut by streams. The Mississippi River flowed in a gorge nearly 800 feet in depth. There were no lakes.

The only rock formations exposed in Green County are the Galena-Platteville limestone which underlies the broad uplands, the St. Peter sandstone which occupies the valley bottoms and lower land. There are a few outcrops of Lower Magnesian limestone along Sugar River and its tributaries. The sandstone forms many striking topographic features — steep bluffs below capping limestone, long, narrow ridges and isolated columns. Prior to the deposition of the St. Peter sandstone there was extensive erosion so that deep valleys were cut in the Lower Magnesian limestone and even through it into the underlying Cambrian. There is no Lower Magnesian limestone in the Monticello well and in some of the deep wells at Monroe.

The physical features of the county are in large measure due to the work of running water, the wind and weathering.

Glacial Geology

On the topographic map is a line of red dots passing near Monticello, Monroe and Browntown. This is the western border of the glaciated area, the eastern border of the Driftless Area. A great continental ice sheet advanced in a westerly direction, occupying the valleys and covering most of the hills, until it reached the approximate position of this line. This was one of the earlier ice sheets and is

called the Illinoian Glacier.

The border between the driftless and glaciated areas is not in all places well defined. To the eastward we find pebbles and boulders (erratics) quite different from the rocks outcropping in this county. They are of quartzite, granite, trap, and other rocks that have been carried by the ice from places far to the northeast. There are deposits of clay containing erratic boulders and gravel deposits with erratic pebbles. Well records show that in some places the thickness of the ice deposited material (drift) is as much as 175 feet. In general, however, the drift is thin and deeply weathered. A considerable amount of the original deposit has been stripped off the slopes and crests by running water and deposited in the valley bottoms.

To the west of the border these evidences of glaciation are lacking. There are no erratic pebbles except ice rafted ones noted below. Instead cuts show clay or sand with fragments of rock from nearby outcrops. There is not a striking contrast in topography between the driftless and glaciated areas. In preglacial times the topography was of course identical on both sides of the line. Glaciation filled valleys, smoothed off hills, and removed crags and pinnacles. The centuries of erosion and weathering since glacial time have obliterated many of these differences. There is no marked terminal moraine along the border.

The ice mass acted as a great dam blocking all valleys flowing easterly or southerly, thus forming lakes in all these valleys. The story of these ancient temporary lakes is written in the deep deposits of sand and clay beneath the level valley plains and in the scattered foreign pebbles, such as granites and quartzites, carried beyond the ice front by floating blocks of ice. These pebbles have been found on the divide between the Little Sugar River and the West Branch at elevations of 1100 feet, indicating that the lake stood at this level. A lake was held in the Pecatonica Valley when the ice front stood south of Browntown. This lake stood at an elevation of about 1,000 feet. The thickness of the drift in the ridge blocking the Pecatonica Valley indicates that the filling was at least 120 feet deep and the depth penetrated by wells in the Sugar River basin indicates as much fill there. The wide valley occupied by the Little Sugar River east of Monticello is of lacustrine origin. It is probable that the lake in the Sugar

Basin drained southwestward to the lake in the Pecatonica Basin through a low point in the divide in the northeast $\frac{1}{4}$ of section 29, Town of Washington.

The northeastern corner of the county was invaded by a much later ice sheet than the Illinoian. A belt of gentle sags and swells with some knolls and sharper kettles (terminal moraine) extends from section 13 to section 4 of the Town of Brooklyn. Foreign boulders of red quartz porphyry, some of them of large size, are conspicuous here. This terminal moraine extends northwest up the east slope of the rock ridge which formed the divide between the Sugar River basin and the tributaries of the preglacial Yahara River. "Reaching the crest of the rock ridge in section 11, Brooklyn Township, it follows this closely, changing its direction from northwest to north, until it crosses the south line of Dane County. At some places its margin lies exactly on the crest of the rock ridge, at others a few rods northeast of that crest. Where it lies to the northeast, as it does in the SE $\frac{1}{4}$ of section 10, Brooklyn Township, it blocked the drainage to the northeast and led to the cutting of a sharp ravine through the limestone crest, by which the waters escaped to the Sugar River basin.... In preglacial times the relief (or difference in elevation) on both sides of this rock ridge was 300 to 400 feet, now it is 240 to 280 feet on the west and only 100 to 150 feet on the east. The present difference is due to the difference in the thickness of the drift."¹

Over the uplands in both the glaciated and driftless areas there is a coating of buff, brown or grey silt. This is a wind-transported dust called loess. The average of 60 measurements of thickness of loess mainly in Green and Rock counties is about five feet.

Geological Resources

Water. The principal sources of ground water are the glacial drift, the Galena - Platteville limestone and the St. Peter sandstone. The deeper municipal wells depend

¹ Alden, W. C., The Quarternary geology of southeastern Wisconsin: U. S. Geol. Survey Prof. Paper 106, p.185, 1918.

upon artesian water from the Cambrian.

Soils. From the standpoint of origin, the principal kinds of soil are residual, loessial and glacial. Knox silt loam was developed from the weathering of limestone and has a wind-blown loess coating. It is a light colored soil formed under timber conditions. The Dodgeville silt loam has a similar origin but was formed under prairie conditions. Wabash silt loam was developed along streams and is the most extensive first-bottom land in the county. It is a stream and lake deposit. The Boone soils were derived from the weathering of sandstone. Miami soils were derived from deeply leached glacial drift.

Limestone. All of the limestones are used as road material. The upper weathered portion of the Galena is easily excavated and grinds easily, hence is a good source of agricultural lime.

Sandstone. The St. Peter sandstone at Browntown is used as a source of molding sand. Some is used as an abrasive.

Sand and Gravel. In the glaciated area deposits of sand and gravel are sources of aggregates for road material and other types of construction.

Lead Mining. The following description of the Newkirk lead mine in section 24, T.3N., R.6E. will be of interest. Mathew Newkirk of Philadelphia bought the land in 1836 and developed the mine. He built a large engine house which was also used as a grist and saw mill about 1850. The mine operated until 1867 when Newkirk sold the land during the depression and went west. Following is a description of the property written in 1947: "The mine is of particular interest because of its size. There is still standing an engine house and mill (?) now used as a barn which is probably a hundred years old. This building is of the size of one of the larger barns in the area and is built of carefully laid stone up to about 20 feet above the ground. The mouth of the mine is an adit commencing from the basement of this old building and reported to extend to the northeast for about $\frac{1}{4}$ mile. About 100 feet northeast of the engine house is a shaft now filled supposed to be as much as 200 feet deep. The works have been blasted in at this point and the stopes of the adit exposed. They are in the

lower Galena beds and are about 15 feet high and 15 to 20 feet wide. The orebody appears to have consisted of a typical lead 'opening' with a feeder vertical crevice. I believe that the adit is open enough that the remainder of it can be entered and explored."

Other "diggings" were (1) Skinner near the corner of sections 2, 3, 10 and 11; (2) T. H. White and White in the northeast quarter of section 14; (3) Frame and Co. on the southeast quarter of section 10, all in T.2N., R.7E. (Monroe).

"The Sugar River diggings are in the vicinity of Exeter, which is situated on section 36, T.4N., R.8E. They are principally in section 27; but are also scattered over sections 28, 33, 34 and 35. The diggings are chiefly on the high rolling prairie, where a thin stratum of the Galena limestone remains undenuded. The surface is usually thickly covered with flints, derived from the decomposing beds of this rock. Most of the ore raised here is from vertical crevices in this rock, although there are some workings on flat openings in the underlying Blue limestone. The first mining in the vicinity of Exeter dates back as far as 1828, and here was the first settlement made in the County of Green. Twenty years ago, two furnaces were kept running on the ore raised here; but, at present, there is little doing. Some fifteen miners were employed in the winter of 1858-9, mostly in working over the old rubbish on the surface. One of the richest lodes discovered was Deville's, which is said to have produced 2,000,000 lbs. of ore, but it was soon worked out. The deepest shaft in this region was down 102 feet: this was nearly twenty years ago: it appears to have been a trial shaft, for the purpose of proving the ground in depth, and did not probably lead to any satisfactory results, the deposits of ore being apparently quite shallow all through the eastern part of the Lead Region. No diggings are known to have produced anything of consequence to the east of Sugar River, and none of those in Green County seem at present to be worked with any continuous success."¹

¹ Hall, James and Whitney, J. D., Report on the Geological Survey of the State of Wisconsin, Vol. I, Pp. 308 and 309, 1862.