

Beaver Creek Valley State Park

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Beaver Creek Valley State Park, established in 1937, is our most southeasterly state park. It consists of about 325 acres of rugged hill and valley land along East Beaver Creek about four miles northwest of Caledonia in Houston County. Both East and West Beaver Creeks have their headwaters on the highlands within the county only a few miles southeast and southwest of the Park. They join just north of the Park, and Beaver Creek flows generally northward to join the South Fork of Root River about five miles from the Park.

The scenery and topography of this corner of the state, well typified by this park, seem not to fit into the pattern of the rest of the state. It seems rather "out of this world." This is one of the very few areas in the state where natural lakes are all but lacking. The only ones that do exist are abandoned portions of the former channel of the Mississippi River. The stream beds are strewn with angular blocks of limestone from the nearby hills, not with rounded boulders as in most of the rest of the state. Here

we find rugged features of mountainous appearance and almost mountainous proportions.

This is a glimpse of "Old Minnesota," as Willard refers to it, where the features have been a long time in the making—an area untouched by the glaciers. This is an area not only notable for its scenery, but valuable for its geologic story. Preserved for us here is a relic of the general type of topography which was presumably encountered and ridden over by the first glacier in other parts of the state.

This area, together with small adjoining portions of Iowa and Illinois and quite a large area in Wisconsin, is known as the "Driftless Area," an area at one time surrounded, but not covered, by glaciers. It is an area unique on the North American continent, except in mountainous regions. Its area is about 15,000 square miles—nearly as large as Denmark. What is it like?

Within the driftless area we find a

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truly "mature" topography. There has been plenty of time for the streams of the area to establish excellent drainage, time to slice away at the uplands until they are only relatively narrow divides, time for the major streams to develop wide flood plains and establish meandering courses across them.

The upland surface of Houston County is relatively level and from 1150 to 1300 feet above the sea. But this surface has been thoroughly and deeply dissected by the streams which plunge rapidly from the uplands to their deep valleys below. The limestones and sandstones through which they have cut produce nearly vertical cliffs varying from only a few feet in the valley heads to 500-600 feet near the Mississippi River. Within the Park, the valley walls rise some 250 feet above Beaver Creek.

The exact line between the glaciated and unglaciated areas is not easily drawn because the boundary was established by the Nebraskan glacier, perhaps a million years ago. This glacier was the first of four that reached southern Minnesota and the only one that extended into Houston County. Whatever deposits were left by it have been all but erased by erosion. Even the granite boulders in most cases, have disintegrated. It was with difficulty, then, that Leverett and Sardeson have tentatively drawn the "Approximate eastern limit of glacial drift in southeastern Min-

nesota," as shown on the accompanying map. Although the Park is not in the driftless area, it is so near the boundary that the topography is indistinguishable from it, except to the expert eye.

The glaciers had several indirect effects on the areas not covered by them. Much additional water from the melting glaciers poured into adjacent streams and greatly increased their erosive power. Headward erosion and widening of valleys in and surrounding the driftless area must have progressed rapidly during these times. Deepening of the valleys also progressed for a while.

Following the last glacier, the Mankato stage of the Wisconsin, enormous quantities of water and debris must have been carried by the Mississippi while its two main tributaries, the Minnesota (Glacial River Warren) and the St. Croix were draining Glacial Lakes Agassiz and Duluth, respectively. After these sources of supply were cut off, the volume of the Mississippi was so reduced, however, that the load of debris dumped into it was too much to carry. It began to drop the excess load in its bed and thus started to fill its valley.

There still remains some 100-200 feet of alluvium beneath the bed of the Mississippi much of the way from St. Paul to the southern boundary of the state. The partial filling of this valley raised the outlets of tributary streams and they, in turn, were

forced to fill their valleys. This process extended up the Root River and several of its tributaries, even as far as the Park.

After the boom days of transporting glacial debris from upstream had subsided, the Mississippi and its tributaries began slowly to cut channels into their filled valleys and thus to produce shoulders or terraces on either side. Winchell describes a terrace at Sheldon, less than a mile from the north boundary of the Park, which is about 30 feet above the level of Beaver Creek.

This terrace extends farther upstream past the Old Schrech Mill and into the north edge of the Park. In fact, it is the entrenchment of the creek about 15 feet into the old alluvial fill that has made possible the building of the dam which furnishes the water power for the mill. This mill, one of the very few within the state that operates directly on water power, is just north of the Park boundary and is one of the favorite attractions.

Another indirect glacial effect on the unglaciated region is the accumulation on the surface of a fine-grained, wind-blown layer of subsoil called "loess." Following each glacial stage, after the ice was gone but before the vegetation cover was reestablished, the winds had easy access to the dust and rock-flour of these regions. The dust was promiscuously scattered over wide areas with

no particular preference for the driftless area. However, this area lay open to receive contributions after each glacial stage and hence has a thicker accumulation than elsewhere, on an average. In Houston County there are thicknesses of loess up to 25 feet.

The bedrock in this corner of the state consists mostly of sandstones and limestones (or dolomites) of the Cambrian and Ordovician periods of geologic time. The lowest (oldest) layers exposed in Houston County belong to a formation called the Dresbach, a Cambrian rock named for exposures near the village of Dresbach just over the line in Winona County.

This formation may be seen in road cuts near the Mississippi River and along the lower Root River near Hokah. The bedrock layers slope gently to the southwest whereas the upland surface is about level, in general. As a consequence, the uppermost layer is found in the southwest corner of the county. This youngest layer is the Decorah shale, an Ordovician rock, found capping ridges in the vicinity of Spring Grove. The rock layers within the Park are intermediate between these two.

The major cliff-forming rock is the Oneota dolomite (a magnesian limestone) which is the lowest of the Ordovician rocks found in southeastern Minnesota. It may be seen as the valley wall along the road just east of the Park and at the Big

Spring inside the Park. Just beneath it is found the uppermost Cambrian layer, the Jordan sandstone. The Oneota in many places has been so dissolved by the groundwater that it presents a honey-combed and cavernous appearance. It is thus very permeable to water. The Jordan is a poorly-cemented, medium to coarse-grained sandstone which is often buff to brown on exposures.

In the region of exposure of these two formations, springs are very common along the valley walls at or near their contact. Springs are not commonly found above a sandstone as porous as the Jordan. However, the situation here is that of a porous sandstone directly overlain by a still more porous and permeable rock, the cavernous dolomite.

Within the Park are several such springs. The one near the southeast boundary, referred to above as the "Big Spring," furnishes so much water that it is the virtual source of East Beaver Creek during the dry season. The water boils up from several orifices near creek level for a distance of about 50 feet.

In this corner of the state flash floods are more common than elsewhere in the state. The streams in dry weather give little hint of the size they quickly attain after heavy rains. Three contributing factors may be pointed out. Not only does this corner of the state receive higher annual precipitation than any other part

(about 32 inches for Houston County) but more than two-thirds of it comes during the warm half of the year. Rain is far more effective in producing floods than an equal amount of snow, of course. Moreover, the tight soil and loess of the region tend to reduce the penetration, at least of that part which falls on the upland, and makes for a greater percentage of surface run-off.

These two factors, coupled with the excellent drainage of this maturely dissected area, means that frequently large volumes of water waste little time in plunging into the deep and often broad valleys below. This creates a variety of problems for the inhabitants. In addition to the frequent loss of crops and livestock, and occasional stranding of people, maintenance of roads, railroads and soil erosion are constantly to be reckoned with.

As one approaches the Park from any direction, he is likely to see numerous examples of contour farming on the uplands that border the steep slopes. Many so-called "dry runs" have their beginnings in these upland fields. Contour plowing is one of the more effective ways of curbing their deprecations. Recent researchers have shown that the rate of erosion in this area can be reduced from one inch of topsoil in four or five years to one inch in about 40 years by proper contour farming and strip cropping. A dry run enters the Park

from the east near the parking area. The name "dry run" is a most deceptive term as describing its condition after a heavy rain.

The park is, as yet, relatively undeveloped. There is a nice, level picnic ground near the creek and trout fishing is available. Foot trails lead to points of interest through a fairly heavy stand of original timber much of the way. There is a large assortment of hardwoods and a few conifers. The larger trees are mostly hard maples, elms, basswoods, white and burr oaks and cottonwoods. There are also ash, white and black walnuts, black locusts, willows, hackberry, birch, popple, and wild cherry. A few white pines may be seen and

there are some fairly thick clumps of red cedars on the more open slopes. An occasional rattlesnake may be encountered on the rocky ledges.

Inasmuch as the glaciers had practically no effect on the topography of this corner of the state, and since it is doubtful whether the Cretaceous seas came quite as far east as this, it is quite possible that this area has kept its head above both ice and water as far back as Carboniferous times. If this be true, we are seeing in Beaver Creek Valley Park the results of some 300 million years of erosion—no wonder Willard called it Old Minnesota. And yet, in the geologic sense, it is only mature.

RABIED CALF

A calf can have rabies, too!

In Becker County recently, death of a young calf was attributed to rabies. The calf had been bitten by a skunk which had the disease.
