Title Keweenawan Basalts, Copper Harbor Conglomerate

Location: Copper Falls State Park. SE¼, Sec. 17, T.45N., R.2E.
Mellen 1:48,000 Planimetric Quadrangle.

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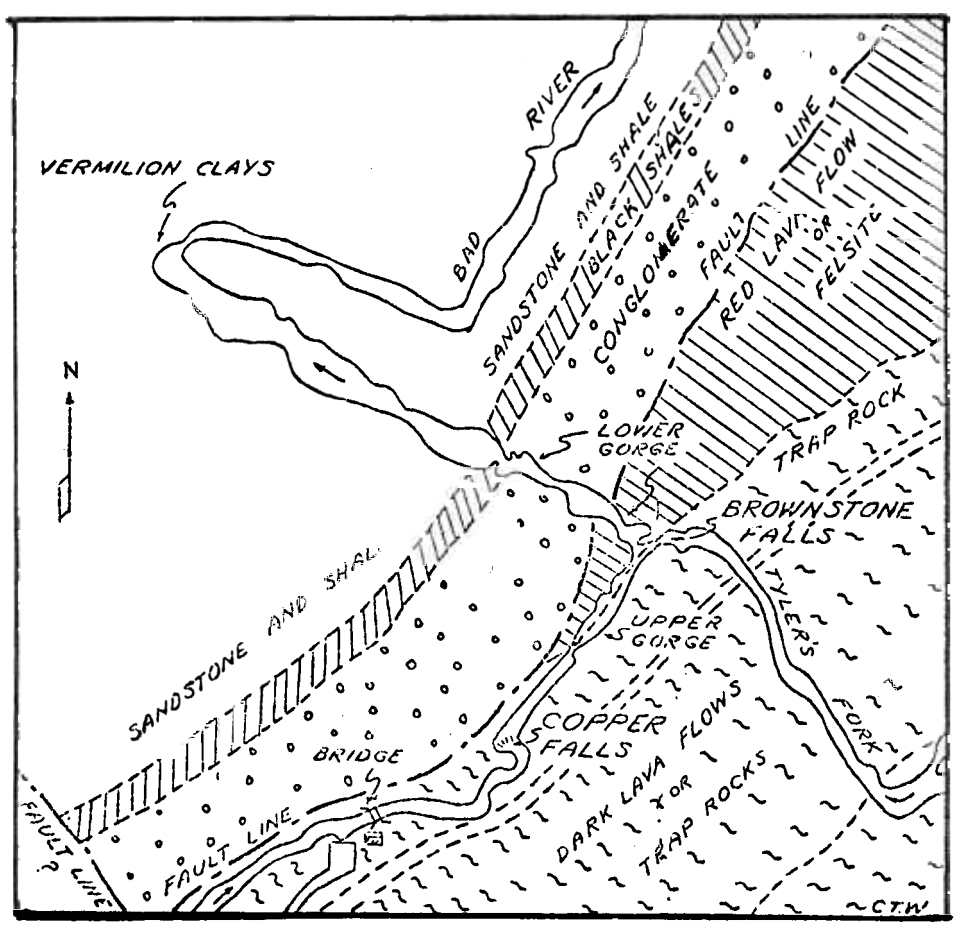
Description: Copper Falls is formed where the Bad River, flowing northward to Lake Superior cuts through the resistant ridge of Keweenawan lava flows. The ridge, formed by erosion of the tilted edge of the basalts, is continuous for more than 150 miles northeast to the end of the Keweenaw Peninsula. Within the Park, the Bad River flows roughly parallel to the strike of the basalts, then turns approximately 90° and crosses the lavas at Copper Falls. Downstream about ¼ mile from Copper Falls, the Tylers Fork River joins the Bad River at Brownstone Falls, which occurs at the contact between basalts to the south and felsite (rhyolite) flow to the north.

The Copper Harbor Conglomerate is exposed in the lower gorge at "Devils Gate" about 600 feet downstream from Brownstone Falls, and immediately northwest of the conglomerate is the black Nonesuch Shale that contains the important sedimentary White Pine Copper deposit about 70 miles northeast of here. And northwest of the Nonesuch Shale is the Freda Sandstone. Thus, a fairly complete Keweenawan section is exposed in the Park.



SKETCH MAP
OF
COPPER FALLS
STATE PARK
Showing the General
Boundaries of the
Rock Formations

G. T. OWEN

(Modified after Aldrich)

Scale - 1" = 1/10 mile

Note: The rock formations are largely concealed by the glacial drift except at the falls and in the stream gorges Boundaries concealed by the drift are projected boundaries

Downstream from the exposures of Freda Sandstone the valley walls are composed of red lake clays formed in Glacial Lake Ashland, a precursor of Lake Superior that stood approximately 521 feet above the present level of Lake Superior. The high hill across the river from the pavillion is a moraine (terminal?) from an earlier advance of the ice.

Significance: The rock sequence exposed here illustrates the change in Keweenawan time from a dominantly volcanic regime to one of sedimentary character. The volcanic rocks are dominantly basalts, but rhyolites are present at a number of levels in the 40,000 foot thick pile. Interestingly, there are few andesites.

The lava flows are believed to have been flowing southward in this general area as indicated by the bent "pipe amygdules" formed by gas bubbles rising through the cooling lava as it flowed. Thus, during the volcanic stage the area now occupied by Lake Superior was higher than the surrounding area.

Cross bedding in the Outer Conglomerate and Freda Sandstone shows that these sediments were deposited by northward moving currents, indicating that a basin had developed in the present site of Lake Superior. Thus, while subsidence may have begun during the volcanic episode, volcanic activity kept the "basin" filled. When volcanism ceased, subsidence of the tremendous pile of basaltic rocks continued forming a basin. Sediments deposited by streams and in the quiet waters kept the basin more or less filled during later Keweenawan time, and perhaps on into early Cambrian time.

References:

Owen, G. T., 1938, The Geology of Copper Falls State Park, Wisconsin Conservation Dept., 6 p.