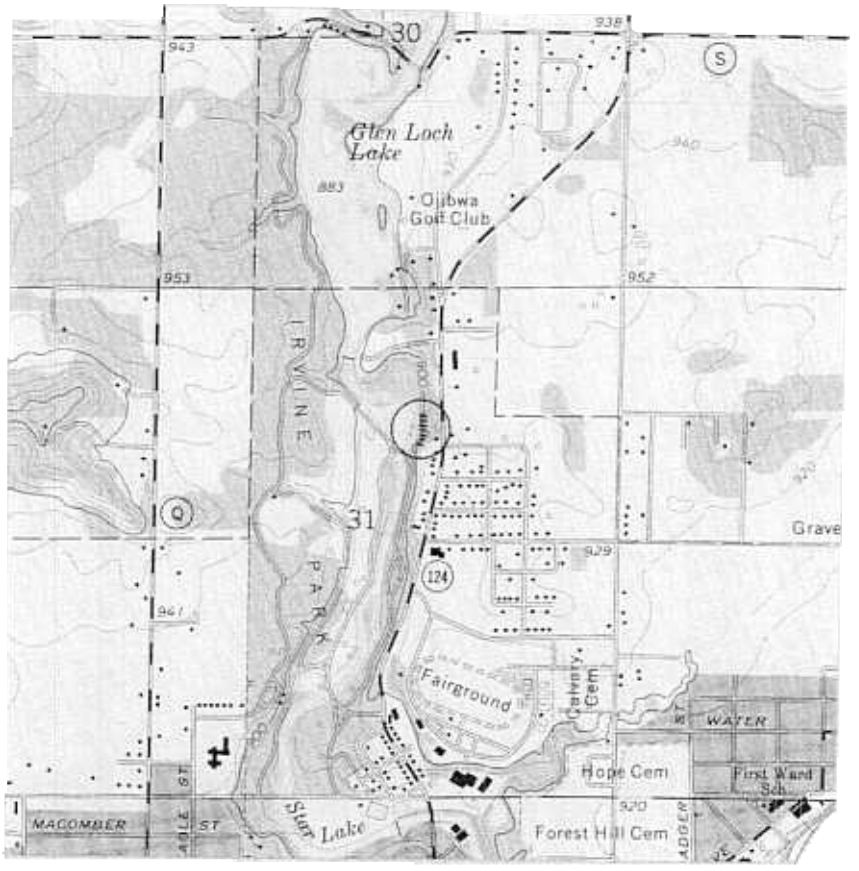
Location: Stream cut in east bank of Duncan Creek just north of first bridge south of Glen Lock dam in Irvine Park near north city limits of Chippewa Falls in the NW¼, SW¼, NE¼, Sec. 31, T.29N., R.8W., Chippewa County (Chippewa Falls, 7½-minute topographic quadrangle, 1972). Exposure can be reached by foot path from northeast side of bridge northward for about 100 yards.



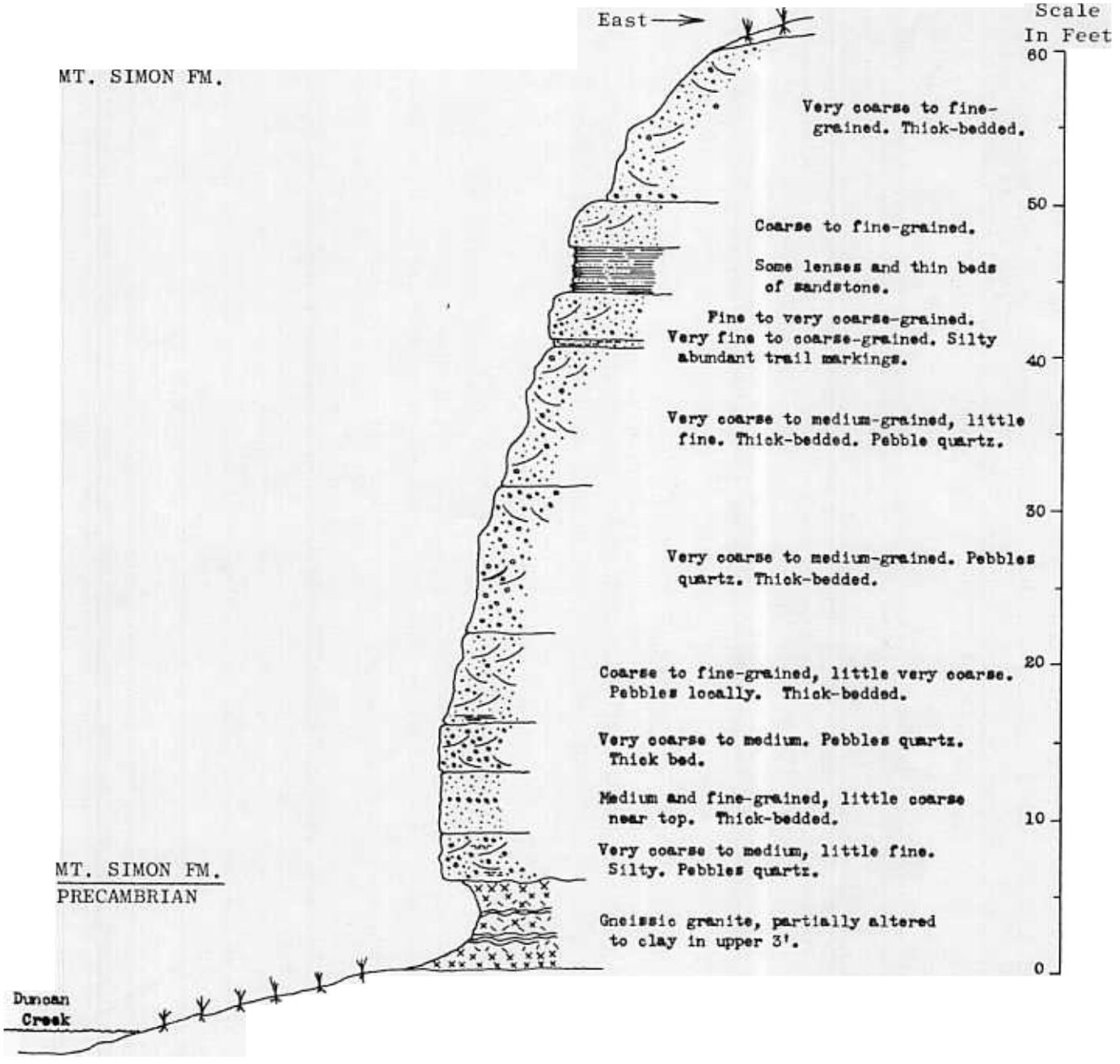
Author: M. E. Ostrom (modified from Ostrom, 1970)

Description: The Mt. Simon Sandstone, presumably the oldest Cambrian formation in Wisconsin, here rests unconformably on weathered Precambrian gneissic granite. This relationship with the Precambrian persists throughout the Paleozoic area of the state except that rock type and altered condition of the Precambrian vary.

Lack of data prevents construction of a coherent "buried" Precambrian geologic map, however drill cuttings reveal that a wide variety of igneous and metamorphic rock types occur beneath the Paleozoic cover. Among the rocks reported are granite, diorite, quartzite, gneiss, schist, iron formation, rhyolite, basalt, slate, shale, and greenstone.

The Mt. Simon Sandstone is believed to have been deposited in a shallow marine nearshore environment by an advancing sea which migrated from southeast to northwest over a weathered and eroded Precambrian rock surface (Ostrom, 1964a).

IRVIN PARK OUTCROP
NW¼, SW¼, NE¼, Sec. 31, T. 29N., R. 8W.



The areal extent of such deposits in the Gulf of Mexico today is limited to the length of the shoreline and a maximum width of about 20 miles. The Cambrian and Ordovician sandstones are believed to be a result of spreading out shallow nearshore marine deposits as blankets during transgression (Ostrom, 1964a). For example, Calvert (1962) shows that the Mt. Simon or its equivalent the Erwin Sandstone, overlaps to the northwest from Tennessee to Wisconsin, that it was deposited during a period of transgression, and that its age is Early Cambrian in Tennessee and Late Cambrian in Wisconsin.

The Mt. Simon has been considered predominantly a quartz sandstone with minor shale, siltstone, and fine conglomerate and minor feldspar (Crowley and Thiel, 1940; Potter and Pryor, 1960). However, in 1968 a study sponsored by the Wisconsin Geological Survey and used as a PhD dissertation by Virendra Asthana revealed that the feldspar content of the Mt. Simon Sandstone averages 18% of which 81% is potash feldspar, 10% is plagioclase feldspar and 9% is microcline. The range in feldspar content reported is from 2.85% to 40.07%. Asthana reports that all of the microcline and plagioclase grains are detrital as are a part of the potash feldspar grains. Authigenic orthoclase is very common but occurs as rhombic overgrowths on detrital grains. On this basis it appears that the Mt. Simon contains far more feldspar than has been previously noted which fact helps to distinquish it from other Upper Cambrian and Ordovician sandstones in Wisconsin.

The source of the Cambrian sands has long been an enigma. Without going into a lengthy discussion of the various hypotheses involving weathering and long transport of eroded Precambrian rocks to produce a relatively clean quartz sand it should be pointed out that there is a ready source available, namely quartzites of Precambrian age. Distribution of the Baraboo Quartzite today is probably the result of a combination of factors including local and regional variations in intensity of metamorphism disintegration, and erosion. It has been noted (Ostrom, 1966) that the Baraboo Quartzite disintegrates by some natural process to yield already rounded monocrystalline quartz sand grains and that this and similar quartzites may have been a major source of sand found in Cambrian and Ordovician rocks of the region. In a quarry located near North Freedom, Wisconsin, steeply tilted beds of quartzite, weathered in the upper few feet, are overlain by flat-lying beds of the Galesville Sandstone. Here weathering of the quartzite released rounded quartz grains which went to make up the Galesville Sandstone; an example of a Cambrian beach deposit. Other quartzites exhibit similar disintegration, namely the Rib Hill and Barron in Wisconsin and the Sioux in Minnesota (Austin, 1969). The fact that these quartzites are extensive, thick, and weather to yield already rounded quartz grains suggests that they may have been a major source of sand supplied to Cambrian and Ordovician seas.

Significance: This exposure illustrates the Precambrian/Paleozoic unconformity in Wisconsin and the character of the initial Paleozoic deposits. Consideration should be given to geologic events which occurred in the time represented by the unconformity.

On the basis of what has been seen and discussed at previous stops how much time is represented by the unconformity? What geologic events occurred during this time? What evidence do you have at this and previous stops for these events? On the basis of sedimentary features and mineralogy, what was the source of Mt. Simon Formation sediments at this stop?

References: Thwaites, 1935; Crowley and Thiel, 1940; Potter and Pryor, 1960 Calvert, 1962; Ostrom, 1964 and 1966; Asthana, 1968; Austin, 1969.