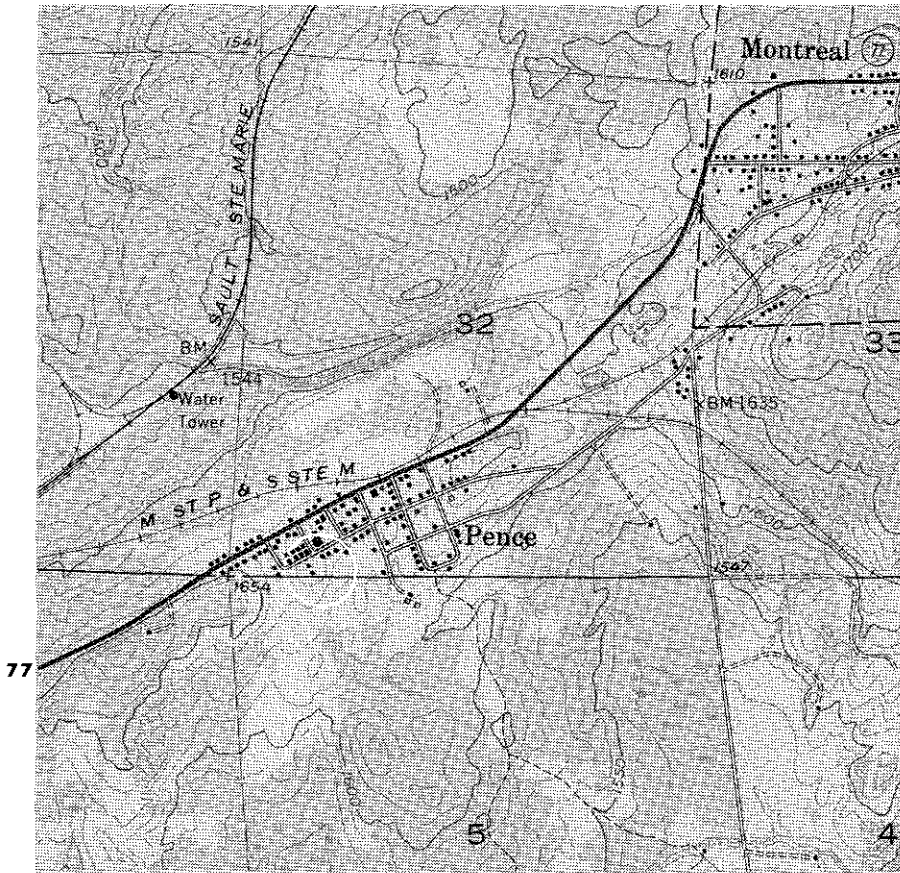


Title: Pence--Basal Palms Formation

Location: Intersection of Whiteside Street and Spruce Street in Pence, Wisconsin. SE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 32, T.46N., R.2E., Iron County. (Iron Belt 7 $\frac{1}{2}$ -minute topographic quadrangle, 1956).



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Description: The Palms Formation is the basal unit of the Middle Precambrian Animikie Group (James, 1958), and unconformably overlies the Bad River Dolomite and Sunday Lake Quartzite of the Chocoday Group (Cannon and Gair, 1970). According to Aldrich (1929), the Palms is continuous throughout the Gogebic range, averages about 450 feet in thickness, and contains a basal conglomerate, a "quartz-slate" unit, and an upper quartzite unit.

At this locality the basal Palms rests on Lower Precambrian granite, the older Bad River Dolomite and Sunday Lake Quartzite evidently having been removed by post-Bad River - pre-Palms erosion. Both west and east of here the Bad River Dolomite and Sunday Lake Quartzite are present between the Palms and the underlying Early Precambrian granite and greenstone. The following generalized description is taken mainly from Aldrich (1929).

The basal conglomerate of the Palms is up to about six feet thick and appears to be derived mainly from the immediately underlying rock types (Aldrich, 1929). It was deposited on an uneven erosion surface, and thus varies in thickness locally. The larger clasts are well rounded at some localities, and very angular

at others according to Aldrich (1929). Here the clasts consist of quartz, chert, granite, and felsic and mafic volcanics, are moderately well rounded and range up to about 8 cm in diameter. The outcrop is slightly phosphatic.

Overlying the basal conglomerate, and comprising about 400 feet of the formation is the thin-bedded "quartz-slate" unit characteristic of the Palms. It consists of alternating quartz-rich and argillaceous beds 1-3 cm thick with ripple marks, cross-bedding and scour-and-fill features common. The quartz-rich beds are composed mainly of quartz, although some are quite feldspathic. Quartz grains range from angular to well rounded, with the larger grains generally the most rounded (Aldrich, 1929). Argillaceous layers consist mainly of fine sericite, chert, chlorite and magnetite. A general coarsening of grain size of argillaceous materials and the appearance of octahedra of magnetite west of the Tyler Forks River is evidently due to contact metamorphism produced by the Upper Precambrian Mellen Gabbro.

The uppermost 50 feet of the Palms consists of a vitreous quartzite composed of medium-grain, well-rounded quartz. Minor mica is present on bedding planes. The quartzite varies from white, green, brown to red (Aldrich, 1929).

The Palms is overlain conformably by the Ironwood Iron-formation. This represents an abrupt transition from clastic sedimentation in the Palms to chemical sedimentation (with virtually no clastics) in the Ironwood. A similar abrupt transition is present throughout most -- but not all -- of the Lake Superior region.

Discussion: The Palms Formation is an important part of understanding the geometry of the Animikie Basin. It is generally correlated with the Pokegama and Kakabeka Formations of the Mesabi and Gunflint districts respectively on the north shore of Lake Superior, and the Siamo and Ajibik Formations of the Marquette district (Cannon and Gair, 1970). The Kakabeka Formation is mainly a conglomerate and generally only a few feet thick (Goodwin, 1954). The Pokegama is mainly a quartzite and up to 167 feet thick (Morey, 1972). These formations underlie the iron-formation in their respective districts. The general thickening of the clastic sequence beneath the iron-formation suggests a deeper (or older) basin to the south, or alternately that the sea was transgressing northward onto the craton at the onset of iron-formation deposition. In the Marquette district, the Siamo Slate and Ajibik Quartzite are 1,000 feet thick in the Neganee area, but thin markedly to only about 100 feet near Michigamme at the western end of the district (Boyum, 1970).

Thus, the nature and thickness of the formations underlying the major iron-formation differs from place to place within the basin and must reflect local differences in the pre-iron-formation history of the Animikie basin. In the Gogebic district, the Palms has some features typical of shallow water deposition, and some (the quartz-slate) which appears to have similarities to deeper water deposition, perhaps transitional into a graywacke-type environment farther south.

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