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WESTERN UNITED STATES 1:250,000

ASHLAND

NL 15-6





EXPLANATION TO ACCOMPANY  
PRELIMINARY BEDROCK GEOLOGIC MAP

ASHLAND QUADRANGLE

by M. G. Mudrey, Jr. 1979

Wisconsin Geological and Natural History Survey

DESCRIPTION OF MAP UNITS

LATE PRECAMBRIAN

- |     |  |
|-----|--|
| Lbg | CLASTIC SEDIMENTARY ROCKS--Bayfield Group--lithic sandstone of late Keweenawan or younger age  |
| Log | CLASTIC SEDIMENTARY ROCKS--Oronto Group--red lithic sandstone of late Keweenawan age   |
| Lfs | CLASTIC SEDIMENTARY ROCKS--Freda Formation--red lithic sandstone, formational member of the Oronto Group   |
| Lns | FINE-GRAINED CLASTIC SEDIMENTARY ROCKS--Nonesuch Formation--gray argillite, formational member of the Oronto Group   |
| Ljs | CLASTIC SEDIMENTARY ROCKS--Jacobsville Sandstone--red lithic sandstone and conglomerate of late Keweenawan age   |
| Lu  | MAFIC VOLCANIC ROCKS--upper lava succession in area west of Mellen; probably correlative with Portage Lake Volcanics of middle Keweenawan age (Chengwatana Volcanic Series is informal name)   |
| Lpl | PORTAGE LAKE VOLCANICS--mafic volcanic rocks and subordinate sedimentary rocks   |
| Lgb | GABBROIC ROCKS--unexposed bodies characterized by strong magnetic attraction   |
| Lml | INTRUSIVE COMPLEX OF MINERAL LAKE--layered gabbroic intrusive body consisting, from top to bottom, a unit of anorthositic gabbro, ferrodiorite, and granophyre, an anorthositic gabbro unit, and a basal troctolite and anorthositic gabbro unit |
| Lmi | MELLEN INTRUSIVE COMPLEX--layered body composed mainly of anorthositic gabbro, troctolite, and granophyre. Age approximately 1,100 m.y.  |
| Lm  | GRANITE OF MELLEN INTRUSIVE COMPLEX--gray or pink, medium-grained porphyritic biotite-hornblende granite. Age approximately 1,000 m.y. or younger (940 m.y.)   |

- Lls SEDIMENTARY ROCKS--wedge of clastic rocks between Lu and Ll units west of Mellen
- Ll MAFIC VOLCANIC ROCKS--lower lava succession in area west of Mellen; probably correlative with Llk unit
- Llk ROCK OF EARLY KEWEENAWAN AGE--consists, from top to bottom, of Kallander Creek Formation (intermediate volcanic rocks and lesser mafic volcanic rocks), Seimens Creek Formation (mafic lavas), and Bessemer Quartzite

#### MIDDLE PRECAMBRIAN

- Mg GRANITIC ROCKS--epizonal granite to tonalite, massive to weakly foliated. Characterized mainly by low magnetic anomalies and smooth gradients. U-Pb zircon ages range from about 1,800 to 1,850 m.y. (W. R. Van Schmus, written commun., 1978)
- Mt TYLER FORMATION--graywacke and argillite, weakly metamorphosed and deformed
- Mi IRONWOOD IRON-FORMATION--composed of ferruginous chert, chert-siderite iron-formation, chert-siderite-silicate iron-formation, and ferruginous slate; local soft iron ore bodies
- Mp PALMS FORMATION--impure quartzite, slaty quartzite, and argillite; in places, thin older Bad River Dolomite included with Palms
- Msv METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS--interbedded pillowed porphyritic basalt, iron-formation, mica schist, slate, and dolomite; in extreme southeastern area of map includes kyanite schist, kyanite-staurolite schist, and garnetiferous biotite schist
- Ms METAMORPHOSED SEDIMENTARY ROCKS--biotite schist with minor iron formations
- Miv INTERBEDDED ROCKS--mafic metavolcanic rocks and lesser iron-formation and clastic sedimentary rocks, including conglomerate. Inferred mainly from strong magnetic attraction

#### EARLY AND MIDDLE PRECAMBRIAN




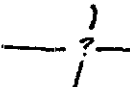
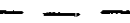









- MEem MAFIC ROCKS--identified by positive magnetic and gravity anomalies within terrane of Early Precambrian gneiss; age uncertain

#### EARLY PRECAMBRIAN

- Eg GRANITIC ROCKS--granite to granodiorite, weakly foliated; equivalent to Puritan Quartz Monzonite or northern Michigan. Rb-Sr whole-rock isochron age about 2,700 - 2,750 m.y.
- Ev METAVOLCANIC ROCKS--dominantly mafic lava and tuff, strongly deformed. Probably equivalent to Ramsay Formation of northern Michigan. Age about 2,700 - 2,750 m.y.

Egn      MIGMATITIC GNEISS AND AMPHIBOLITE--biotite-quartz-feldspar gneisses, tonalite gneiss, and amphibolite. In area south of Mellen Rb-Sr whole-rock isochron age of about 3,200 m.y. (Z. E. Peterman, verbal commun., 1978)

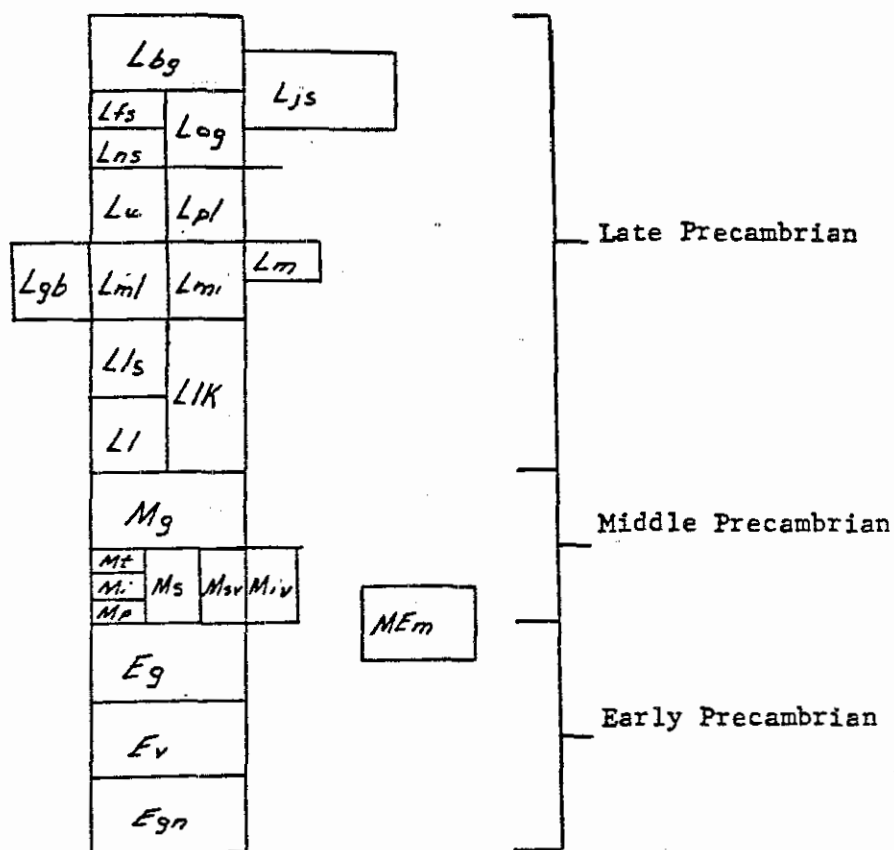
#### MAP SYMBOLS

-  EDGE OF PALEOZOIC ROCKS--approximately located
-  CONTACT OF PRECAMBRIAN ROCKS--located on ground or by airborne magnetic survey
-  FAULT--inferred mainly from aeromagnetic data; dashed where uncertain, arrows indicate horizontal movement, U, upthrown side; D, downthrown side
-  Relationships of fault intersections not known
-  TREND OF AEROMAGNETIC ANOMALY
-  TREND OF KNOWN OR INFERRED IRON-FORMATION
-  MINOR FOLDS--showing plunge of axes
- STRIKE AND DIP OF BEDS
-  normal
-  vertical
-  overturned
- STRIKE AND DIP OF FOLIATION
-  normal
-  vertical
-  showing plunge of lineation
-  (17) AERORADIOACTIVITY ANOMALY--from Geoterrex (1978)

#### PRINCIPAL SOURCES OF GEOLOGIC DATA

Compiled principally from Sims, Cannon and Mudrey (1978), Dutton and Bradley (1970), and Bodwell (1972). See main text for full citation

# CORRELATION OF MAP UNITS



Note: Designations used on map have following time boundaries:

- Late Precambrian, -600-1,800 m.y.
- Middle Precambrian, 1,800-2,600 m.y.
- Early Precambrian, 2,600 or older m.y.