GEOLOGICAL SURVEY
Paul K. Sims, Director

STATE OF MINNESOTA
UNIVERSITY OF MINNESOTA

BULLETIN 44, PLATE 1

Geology mapped in 1953-54

## EXPLANATION

**Microgabbro dikes and sills**
gm, *Fine- to medium-grained diabasic gabbro; includes granodiorite (gd) and granophyre (g) in the Endion sill*

**Granophyre**
*Fine- to medium-grained red leucogranite; detailed implication intergrowth of quartz and feldspar; "red rock"*

**Ferrogranodiorite**
*Medium-grained, dark-gray, iron-rich, pyroxene granodiorite*

**Layered series gabbro**
*gl, Medium- to coarse-grained, dark-gray, olivine gabbro characterized by fluxion structure or rhythmic layering; formed by multiple intrusions*
*glb, Coarse-grained melagabbro with minor peridotite; intrusion at Bardon's Peak*

**Anorthositic gabbro**
*Very coarse-grained, light-gray, feldspathic gabbro; cognate inclusions abundant*

**North Shore Volcanic Group**
*Lava flows and interflow sediments; Nsb, basalt flows; Nsr, flows of adamellite and rhyolite compositions; Nss, interflow sediments, chiefly coarse-grained sandstone composed of disintegration products of flows*

**Puckwunge Formation**
*Gray to buff, medium-grained sandstone; local quartz pebble conglomerate at base*

**Thomson Formation**
*Gray to black interbedded slate and graywacke; sericite-chlorite-quartz-plagioclase slate grades to, and is interbedded with medium- to coarse-grained graywacke containing angular quartz, plagioclase, and rock fragments cemented by chlorite and sericite*

*Outcrop areas indicated by darker color, as shown for Thomson formation*

DULUTH GABBRO COMPLEX — LATE PRECAMBRIAN — MIDDLE PRECAMBRIAN

Contacts
Dashed where approximate, dotted where inferred

Gradational contact

Strike and dip of beds

Strike and dip of igneous flow banding

Strike and dip of fluxion structure or rhythmic banding

APPROXIMATE MEAN DECLINATION, 1954

# GEOLOGIC MAP OF DULUTH AND VICINITY ST. LOUIS COUNTY, MINNESOTA

BEDROCK GEOLOGY

By
Richard B. Taylor

SCALE 1:24000

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

Base map from U.S. Geological Survey quadrangles (7.5 minutes topographic series)

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