

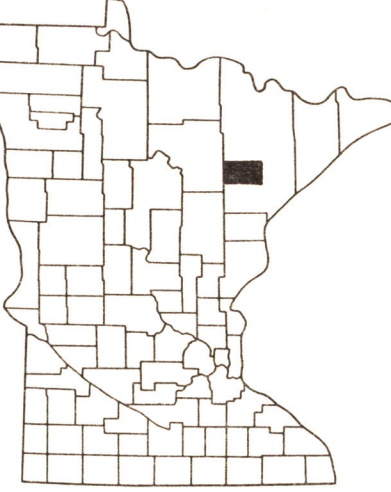
EXPLANATION

FORMATIONS  
Hesperium  
Virginia slate  
(Animikie)  
PRE-CAMBRIAN

The stratigraphic classification and nomenclature of this report follow the usage of the Minnesota Geological Survey.



Magnetic contours with flight traverse; dashed contours indicate incomplete or doubtful data; hatched contour encloses area of lower magnetic intensity; 'x' and number denote location and value of measured maximum or minimum intensity within closed contour.



Index map of Minnesota.

An aeromagnetic survey covering an area of approximately 30,000 square miles in north-central Minnesota was made during May and August 1947, May 1948, and September and October 1949 by the U. S. Geological Survey in cooperation with the Minnesota Geological Survey. The purpose of the survey was to delineate the major magnetic trends associated with known iron ore deposits and to indicate areas that may be favorable for additional exploration.

North-south traverses were flown at 1-mile intervals. This spacing was selected to cover as large an area as possible with a minimum of flying. The aeromagnetic information is presented in two forms: as an aeromagnetic map, contoured to a common arbitrary datum, and as magnetic profiles that accompany the map.

The measurements were made with an AN/ASQ-3A airborne magnetometer installed in a Beechcraft AT-11 airplane for the 1947 and 1948 flights and in a Douglas DC-3 for the 1949 flights; the detecting element of the magnetometer was towed about 75 feet below the plane. The elevation of the plane, ranging between 900 and 1,100 feet above the ground, was recorded with a continuous-recording radio altimeter. Aerial photographs were used for pilot guidance during the flights, and the flight path was recorded by a gyro-stabilized continuous-strip camera. Positional accuracy of all the surveys after 1947 was increased by use of a gyro-stabilized vertical sight.

G. M. Schwartz, Director of the Minnesota Geological Survey, provided the geologic and well information presented on this map.

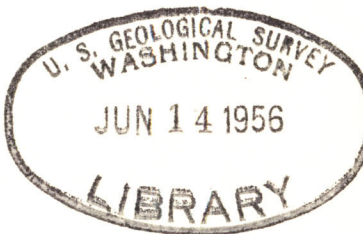
The area covered by this map is a swampy plain underlain with Pleistocene sediments of glacial Lake Upton and thick glacial drift. No outcrops of bedrock are known in this area, and it is doubtful if any exist. None of the wells in this area has reached bedrock, but at Meadowlands, about 3 miles south of the surveyed area, in sec. 15, T. 53 N., R. 19 W., wells are reported to have penetrated slate at depths ranging from 72 to 125 feet.

The area shown on this map is presumably underlain with Virginia slate, which dips from 10° to 15° S. toward the Thomson slate in Carlton County. Previous magnetic work in this area has shown uniform conditions over this entire region. The magnetic anomaly in T. 56 N., R. 10 W., which gradually dies out across T. 56 N., R. 19 W., and T. 55 N., R. 20 W., has been shown previously<sup>1</sup> to be an expression of the Eveleth anticline in the Animikie formation and a part of the Virginia Horn area of the Mesabi range.

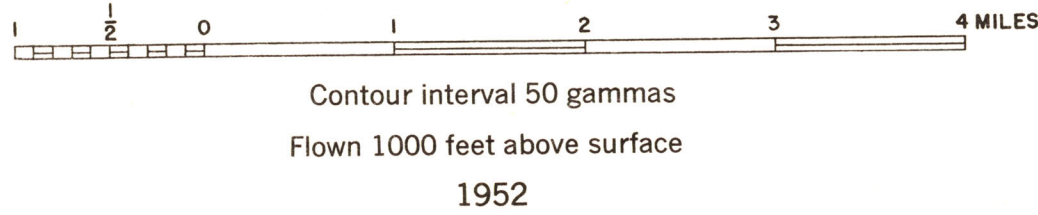
<sup>1</sup>Schwartz, G. M., Report on magnetic work in St. Louis County: Commissioner of Iron Range Resources and Rehabilitation Rept. Inv. No. 1, pp. 9-10, 1945.

Note

Aeromagnetic data are obtained and compiled along a continuous line whereas ground magnetic surveys are made at separate points. Errors within the normal limits of any magnetic measurement may cause slight discrepancies between flight lines in an aeromagnetic map, which would be more obvious than similar discrepancies between points in a ground magnetic map. For this reason as much care should be exercised in evaluating magnetic features that appear as elongations along a single aeromagnetic traverse as in interpreting an anomaly indicated by a single ground station.



TOTAL INTENSITY AEROMAGNETIC AND GEOLOGIC MAP OF PART OF SOUTHWESTERN ST. LOUIS COUNTY, MINNESOTA  
RELATIVE TO ARBITRARY DATUM



SHEET 1 OF 2

INTERIOR - GEOLOGICAL SURVEY, WASHINGTON, D. C.  
Aeromagnetic survey 1948-1949, R. Henderson and J. L. Meuschke  
Compilation directed by J. L. Meuschke

For sale by U. S. Geological Survey  
PRICE 70 CENTS

Minnesota (St. Louis Co., Sw.) aeromagnetic  
1952.  
Sheet 1  
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