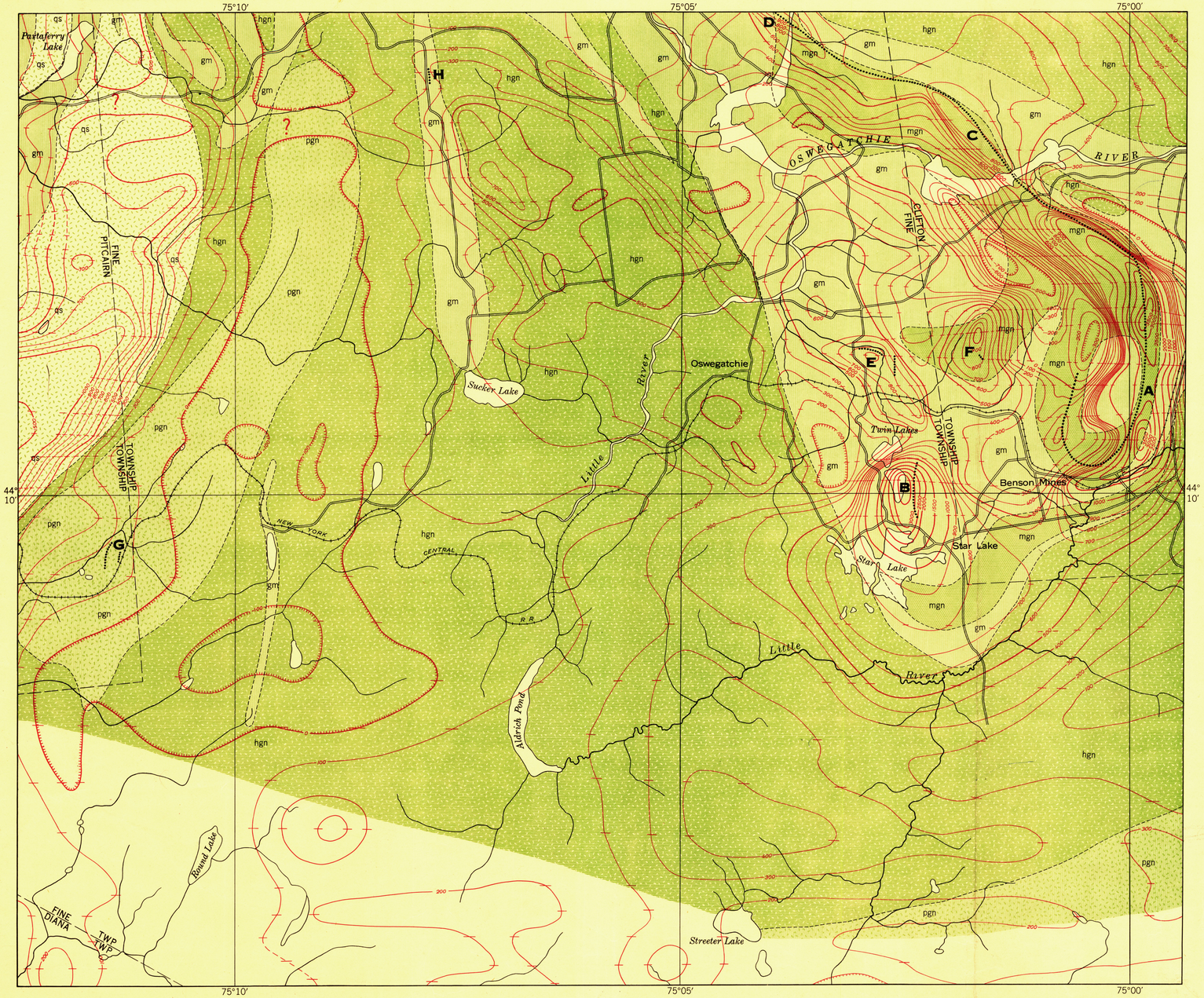
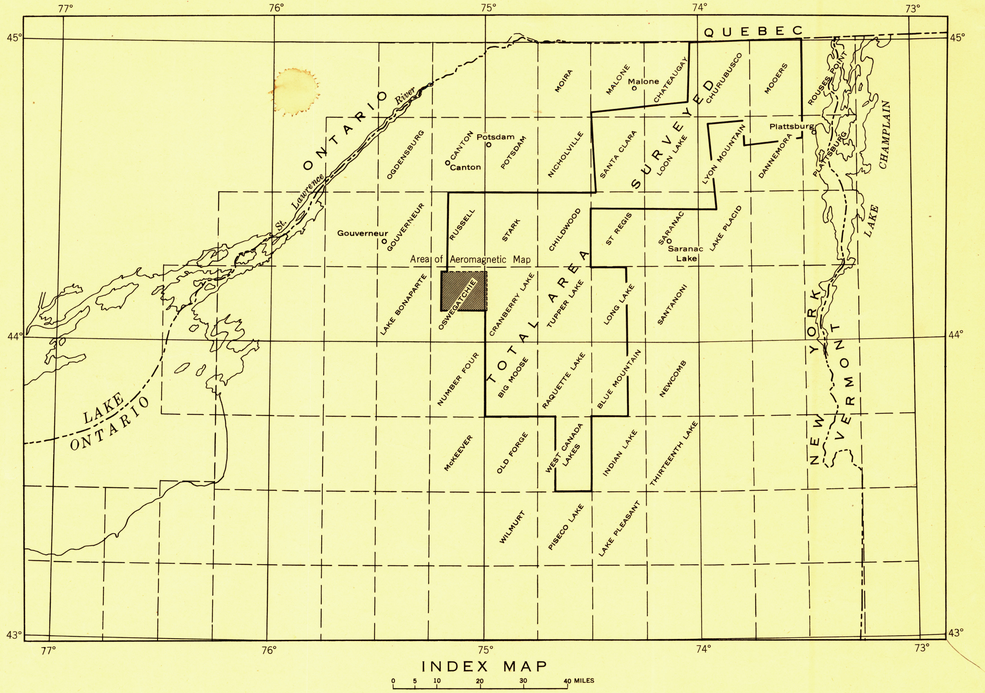
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEOPHYSICAL INVESTIGATIONS,
PRELIMINARY MAP NO. 1





INDEX MAP

EXPLANATION

MAGNETIC FEATURES

Total intensity isogams showing intersections with traverse lines
(Isogam interval 100 gammas below 1000 and 500 gammas above 1000)

Depression isogam

GEOLOGY

PRE-CAMBRIAN

mgn — Microcline granite gneiss
(Fine grained, generally sillimanitic)

hgn — Hornblende granite gneiss
(Medium grained, with local alaskitic facies)

pgn — Hornblende granite gneiss
(Coarse grained; much of it with phacoidal structure)

Quartz syenite series:

qs — Quartz syenite

gm — Metasediments of the Grenville series

B — Magnetite deposit
(Approximately located. Letter indicates locality referred to in text)

Approximate contacts

EXPLANATORY TEXT

In May and June of 1945 the Geological Survey carried out a magnetic reconnaissance survey of an area of approximateley 3,170 square miles in the Adirondacks of northern New York, using an airborne magnetometer developed by the Navy for anti-submarine patrol. Details of equipment and technique are covered in a separate report by J. R. Balsley. Details of results of dip-needle surveys of anomalies recorded by the Adirondack aerial survey are described in Geological Survey Strategic Minerals Investigations, Preliminary Report (3-194).

The adjoining magnetic map of the Oswegatchie quadrangle is the first of a series of preliminary maps showing the results of the Adirondack aeromagnetic survey. Other maps in the series will be released as fast as the data can be compiled. It is anticipated that these preliminary maps will eventually be included in a final report which will treat problems of geologic interpretation and magnetic theory in more detail.

The Oswegatchie magnetic survey was flown at a constant altitude of 2,400 feet (1,000 feet above ground) on east-west traverse lines. Lines were spaced at quarter-mile intervals over the northern half of the area, and at half-mile intervals over most of the southern half of the area. Field work was done during the morning of June 27, 1945. The location of flight lines where they intersect isogams is shown on the map by short cross lines. A correction of 200 feet for instrumental lag has been applied to all profile curves except over the Benson Mines anomaly, where the intensity of the magnetic gradient has apparently reduced the lag effect to a negligible value. Variations arising from diurnal effects and instrumental drift have been essentially eliminated by adjusting all profile curves to a common magnetic datum established by a magnetic base-line traverse which intersected all the profile traverses. The datum, or zero-anomaly, isogram was selected arbitrarily by inspection. No correction has been made for latitude variations in magnetic intensity.

It is estimated that in general the isogams are correctly placed to within 200 feet. Errors—for the most part negligible—may have crept in due to inaccurate location on the base map of the curves recorded in the air, to inaccuracies in determining the magnetic datum, and to inability to hold the airplane at a constant altitude. Two localities are indicated in the northwest corner of the map by question marks, where inaccurate magnetic datum determinations may have given the profile curves excessively high or low values, probably not greater than 100 gammas.

Two conspicuous features of the magnetic map are (1) the close correlation of high-intensity anomalies and strong magnetic gradients with most of the strong anomalies on the surface, and (2) the correlation of broad magnetic trends with regional geological features. The Benson Mines (“A” on map), Twin Lakes (B), Benson Mines Extension (C), Skate Creek (D), Twin Lakes Stream (E), and Anderson (F) anomalies all appear as conspicuous features of the aeromagnetic map. The Jayville (G) and Greene Farm (H) anomalies, however, gave a much weaker indication on the airborne magnetic record. The negative anomaly west and northwest of the Benson Mines anomaly is probably the effect of the negative magnetic pole of the Benson Mines body. Quartz-syenite, and metasediments of the Grenville series, with associated migmatites and sillimanitic granite, coincide with areas of moderately high intensity; uncontaminated granite, on the other hand, gives very little magnetic relief.

Aeromagnetic survey by J. R. Balsley,
D. L. Rossman, and C. L. Rogers, U. S. Geological Survey,
and E. M. Canfield, Aero Service Corporation.

Magnetic data compiled by H. E. Hawkes,
W. J. Dempsey, M. E. Hill, and J. L. Meuschke, 1945.
Preliminary geology by A. F. Buddington and B. F. Leonard, 1945.

AEROMAGNETIC MAP SHOWING TOTAL INTENSITY 1000 FEET ABOVE THE SURFACE OF PART OF THE OSWEGATCHIE QUADRANGLE

ST. LAWRENCE COUNTY, NEW YORK

0 ½ 1 2 3 MILES

1946