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Institute of Geological Sciences

Mineral Reconnaissance Programme Report

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No. 10
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Talnoy mine,
Kirkcudbrightshire,
Scotland**

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**Geophysical surveys around Talnotry mine,
Kirkcudbrightshire, Scotland**

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Geophysical surveys around Talnothy mine, Kirkcudbrightshire, Scotland

M.E. Parker

SUMMARY

Magnetic field and VLF electromagnetic surveys were performed to investigate the nickel-cobalt mineralisation at Talnothy, Kirkcudbrightshire. No significant anomalies were found in the area investigated, except over the small amount of mineralisation already known.

INTRODUCTION

Geology and target

The old nickel mine at Talnothy lies in Kirkcudbrightshire, about 8.5 km north-east of Newton Stewart, at OS grid reference NX 477 702. The history of the mine, and the nature of the mineralisation have been dealt with by Wilson (1921), Jones (1924), and Gregory and Leitch (1927). To summarise: the mine was opened as a trial between 1885 and 1900, and about 100 tons of ore raised, but not taken away. The mineralisation occurs at the junction with the surrounding Silurian greywackes of an altered diorite sheet. It is well within the thermal aureole of the Cairnsmore of Fleet intrusion, lying about 200 m from the margin, as shown on Fig. 1. The deposit is lenticular in form, about 20 m long and up to 4 m wide, elongated approximately east-south-east to west-north-west. It contains copper ores, nickeliferous pyrrhotite and niccolite, arsenopyrite and some cobalt minerals.

The aims of the geophysical surveys were to indicate any extension of the known mineralisation, and to search for similar occurrences, or sections of the same structure separated by faulting. The steep topography of the area, and its dense afforestation by young conifers greatly hindered work.

GEOPHYSICAL SURVEYS

The survey traverses are shown on Fig. 1. A Very Low Frequency electromagnetic (VLF EM) survey instrument was used over all east-west lines, tuned to GBR at a frequency of 16 kHz. In addition, total magnetic field measurements were made along all the traverses, at intervals of 10 m or less. A hand-held metal detector (EM 15) was used in the immediate area of the mine.

RESULTS AND INTERPRETATION

The VLF EM data show almost no variation over the area even across the known mineralisation and the mine tip. This indicates that the conductivity of the mineralisation is not significantly different from that of the surrounding rock. Small features occur on the western ends of lines 60N and 240N, indicating a band of

increased conductivity due probably to a small stream, but perhaps to fracturing or to overburden variations.

Strong magnetic anomalies, up to 1000 nT occur over the lode and the tip, presumably due to the pyrrhotite. However, these fade to nothing within 30 m north and south, and 20 m east and west of the deposit. No comparable features were found elsewhere in the survey area, where the variations in magnetic field measured were small.

The EM 15 metal detector responded to the known mineralisation, locally quite strongly, and indicated that the magnetic rather than conductive properties of the ore were being sensed. Away from the old mine, no response at all was obtained.

CONCLUSIONS

The nickel mineralisation at Talnothy Mine is limited in extent to the lenticular lode which can be seen, and has been largely removed and dumped nearby. No evidence was found within the area investigated of any comparable body.

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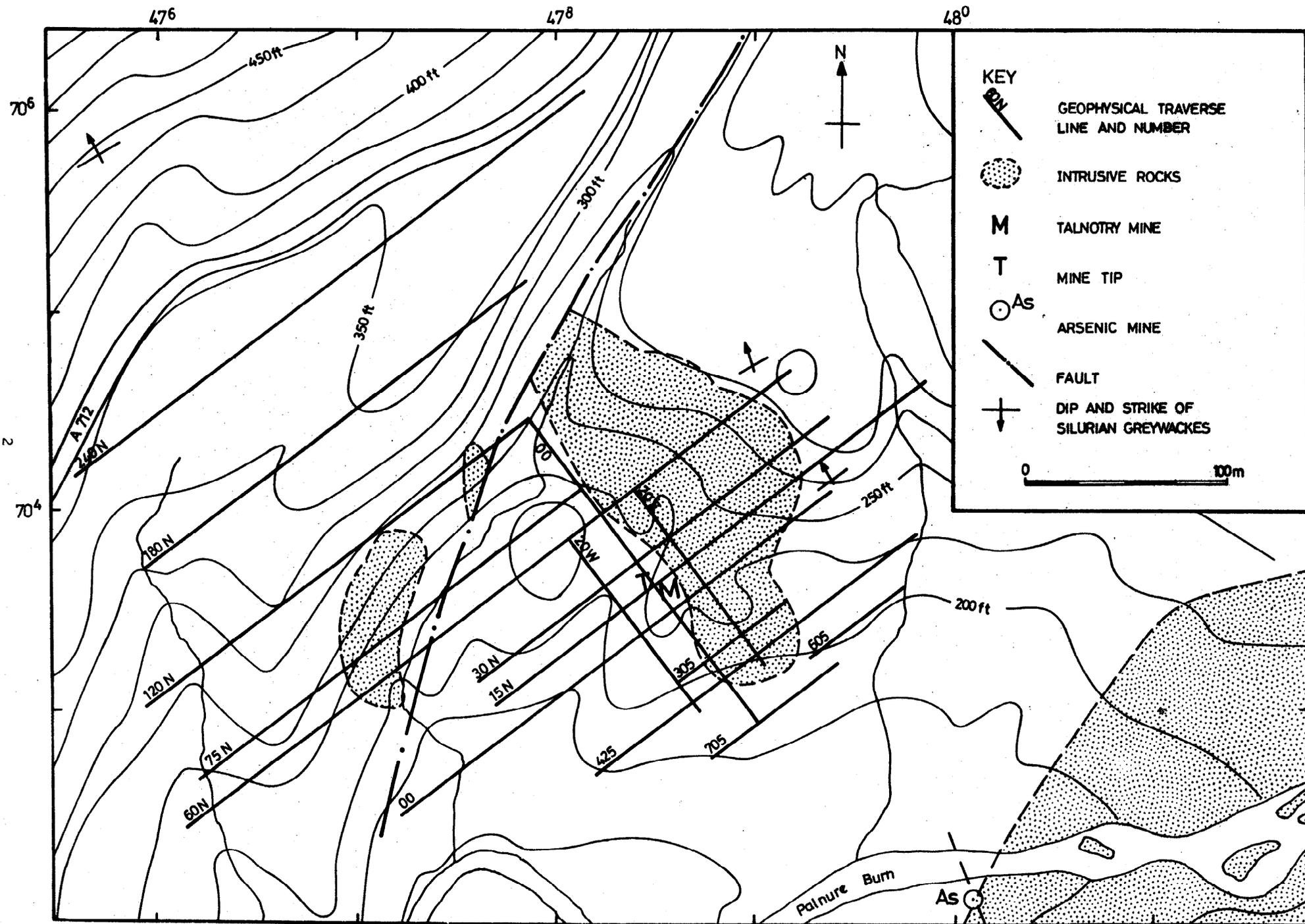


FIG. 1. TALNOTRY AREA: GEOLOGY AND GEOPHYSICAL TRAVERSE LINES