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**MICROFILMED**

INVESTIGATION OF FIVE AEROMAGNETIC ANOMALIES

E.L.15/65, SHEFFIELD, TASMANIA

by

K. M. HALL

C. P. TAYLOR

**MICROFILMED**

MELBOURNE

MARCH, 1968.

# FIG. 1

001

146° 0' E  
400000E

450000E

41°  
950000N

BURNIE

T1

ULVERSTONE

T5A

T5B

DEVONPORT

Leven

SHEFFIELD

River

T2

900000N

Forth

Mersey

41° 30'

E.L. 15/65

DELORAINE

ORIGINAL E.L. 15/65

River

River

850000N



137002

T4 Traverse and number

## LOCALITY MAP GEOPHYSICAL TRAVERSES E.L. 15/65 SHEFFIELD, TASMANIA

5 cm

SCALE OF MILES

0 10 20

27-3-68 G.B.

TSh. 1

A4-1032

### INTRODUCTION

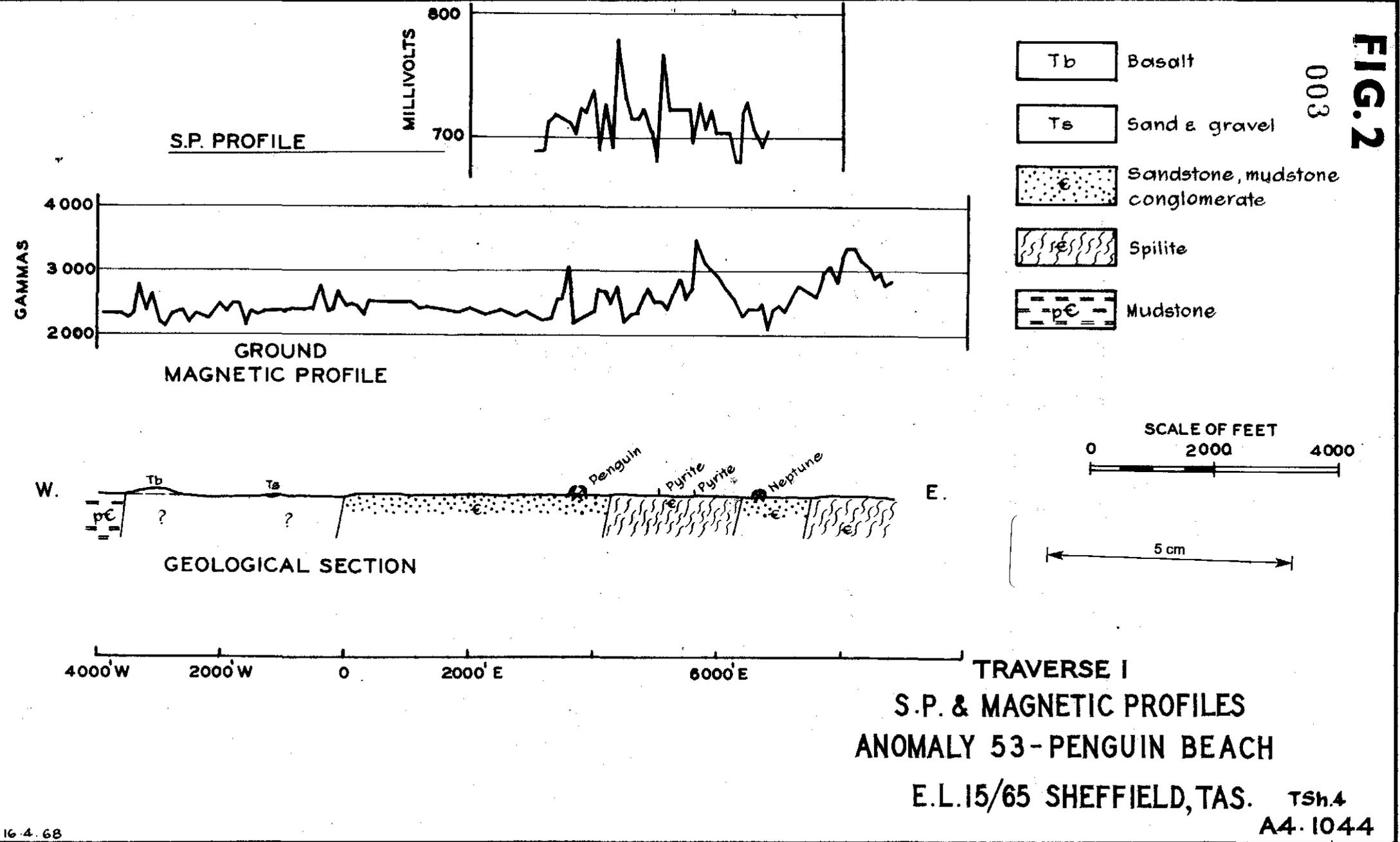
During March and April of 1966 AMEG Pty. Ltd. carried out an aeromagnetic survey near Sheffield, Tasmania, over an area covered by our E.L.15/65 to assist the search for iron ore and other minerals. A year later W. Chesnut examined the geology corresponding to the 142 listed aeromagnetic anomalies and he concluded that five of these warranted further investigation. This was done in January 1968 and is the subject of this report.

Six geological and geophysical traverses were made over each of the five anomalies as indicated on Fig. 1. Magnetic readings were taken along all traverses and S.P. on three. Stations were at 100' intervals except on the traverse over anomaly 22, where infill stations at 50' were required. The total survey lengths for each method were - ground magnetic 52,000' and S.P. 8,000'.

The survey was made by W. Cherrie assisted by P. Crawley. K. M. Hall was responsible for mapping the geology near the magnetic anomalies.

Our Askania torsion magnetometer No. Gfz 582374 and our Austral S.P. meter, Model S.P.2 were used on the survey.

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- Tb Basalt
- Ts Sand & gravel
- e Sandstone, mudstone conglomerate
- re Spilite
- pE Mudstone

SCALE OF FEET  
0 2000 4000

5 cm

TRAVERSE I  
S.P. & MAGNETIC PROFILES  
ANOMALY 53-PENGUIN BEACH

E.L.15/65 SHEFFIELD, TAS. TSh.4  
A4.1044

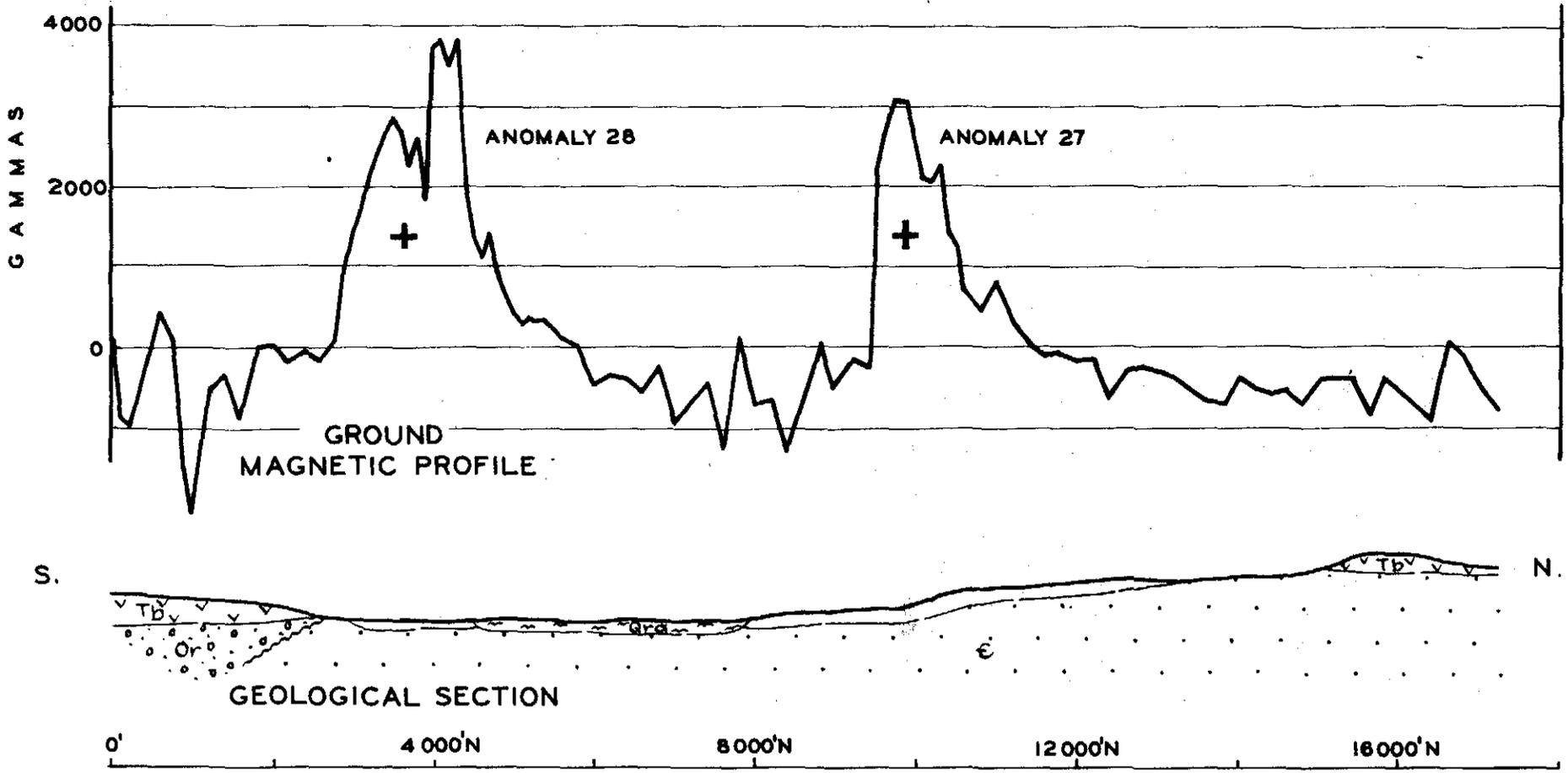
## RESULTS

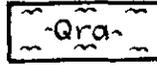
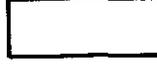
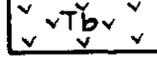
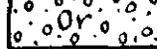
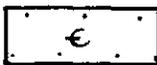
### 1. ANOMALY 53 (PENGUIN BEACH)

The Penguin shore platform was selected for ground geophysical work on the basis of surface mineralization (lead - copper - pyrite) near the old Penguin mine which produced silver and lead during 1871 and 1872. The traverse crossed the northern end of aeromagnetic anomaly 53.

A generalized section along the shore platform is shown on Fig.2. The westerly dipping sediments adjacent to the old Penguin mine consist of hornfels, quartzite, tuff, tuffaceous sandstone, mudstone, conglomerate and chert. There are sulphide veins in chert, conglomerate and spilite.

The aeromagnetic anomaly is caused by spilite which is weakly magnetic compared to the non-magnetic surrounding rocks. However, there are several nearby magnetic anomalies which are not resolved on the aeromagnetic survey. One of these has an amplitude of 800 gammas and is slightly west of the Penguin Mine. There is no anomaly over the Neptune mineralization. There is no significant SP anomaly along the traverse. Minor lows may correspond to the pyrite mineralization shown on the section but this is doubtful.



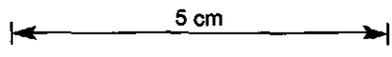
-  Alluvium
-  Soil with basalt float
-  Basalt
-  Roland Conglomerate
-  Gog Range Greywacke

TRAVERSE 2  
MAGNETIC PROFILE—ANOMALY 27 & 28  
E.L. 15/65 SHEFFIELD, TAS.



TSh.5  
A4.1045

16.4.68



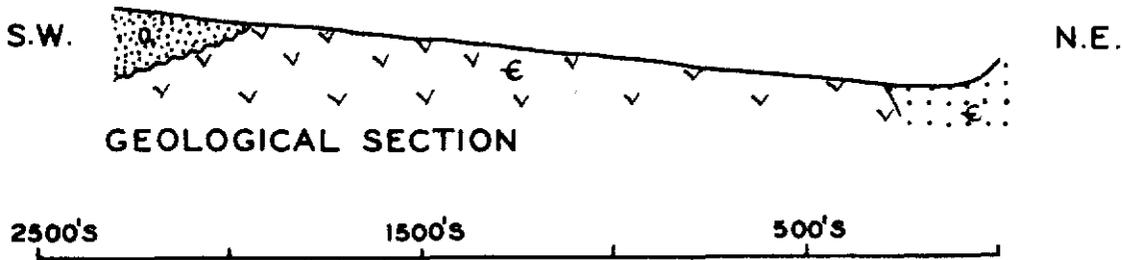
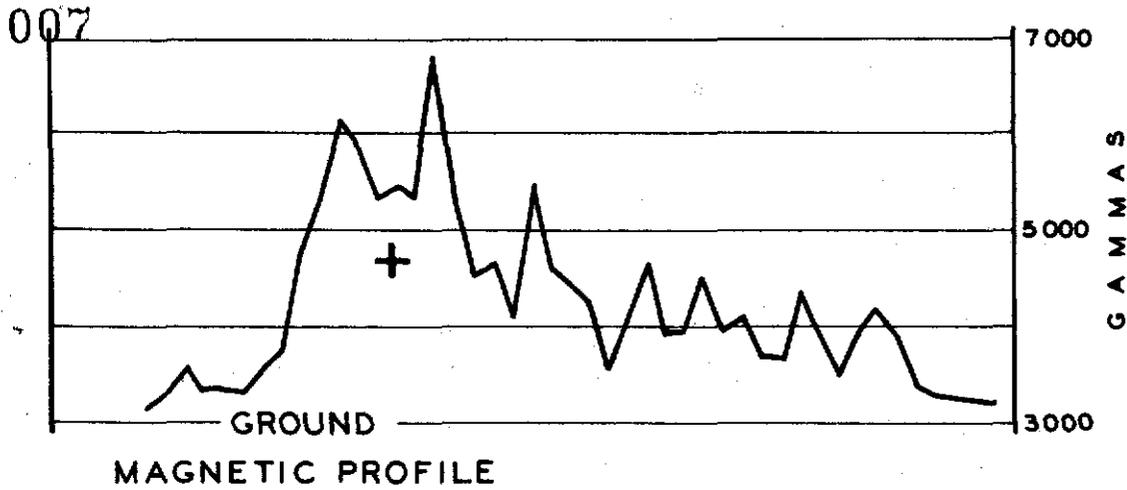
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2. ANOMALIES 27 & 28

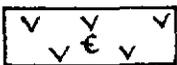
Anomalies 27 and 28 are near Wilmot, which is eight miles west of Sheffield. They were selected for further investigation primarily because of their amplitude (2,000 gammas), which makes them the largest aeromagnetic anomalies in E.L. 15/65.

The rocks producing both anomalies are hidden by soil and alluvium. Magnetic quartz dolerite outcrops near the falls on the Forth River where there is a similar aeromagnetic anomaly and this has been suggested as the cause of the anomalies. However this outcrop is  $1\frac{1}{2}$  to 2 miles away and also anomalies 27 and 28 have much higher amplitude although the rocks causing the anomalies are covered by non-magnetic soil and alluvium.

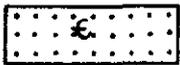
**FIG. 4**



Quartzite



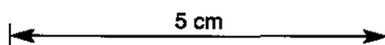
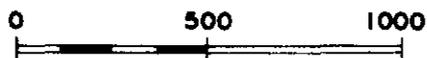
Basic volcanics.



Sandstone, quartzite

**TRAVERSE 3**  
**MAGNETIC PROFILE—ANOMALY 22**  
**E.L. 15/65 SHEFFIELD, TAS.**

SCALE OF FEET



3.

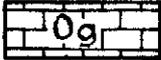
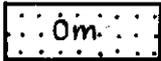
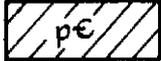
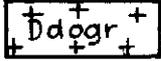
3. ANOMALY 22

Anomaly 22 is a distinctive 2,500 aeromagnetic anomaly fourteen miles south - east of Sheffield. A.M.E.G. considered the source to be a dyke - like body of ultrabasic rocks 200' below the surface.

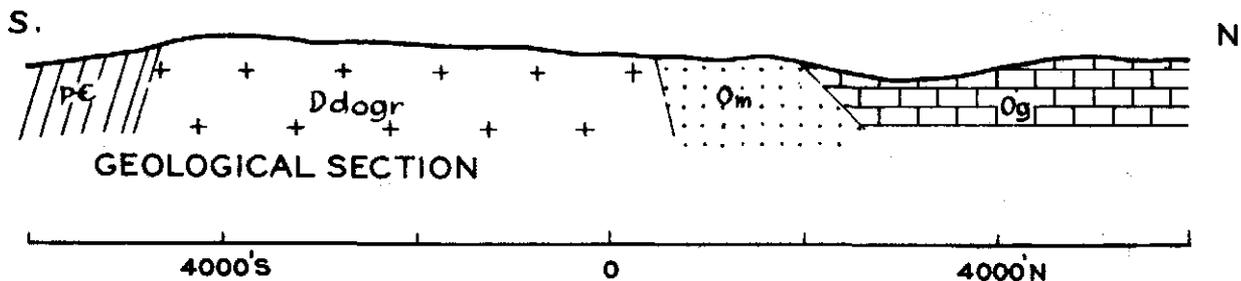
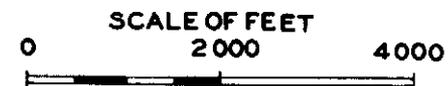
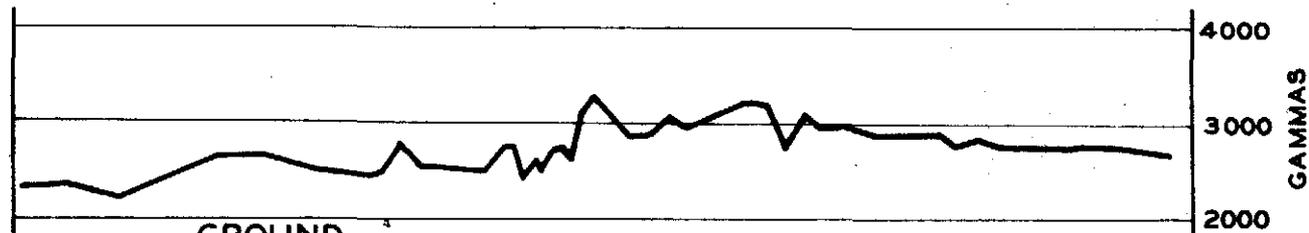
The anomaly corresponds to an outcrop of basic volcanics, probably basalt (Fig. 4) and hand specimens of this work are weakly magnetic.

S.P. PROFILE



-  Gordon Limestone
-  Moina Sandstone
-  Dove group
-  Dove Granite

GROUND  
MAGNETIC PROFILE



TRAVERSE 4

S.P. & MAGNETIC PROFILES-ANOMALY 12

E.L.15/65 SHEFFIELD, TAS.

TSh.7  
A4.1047

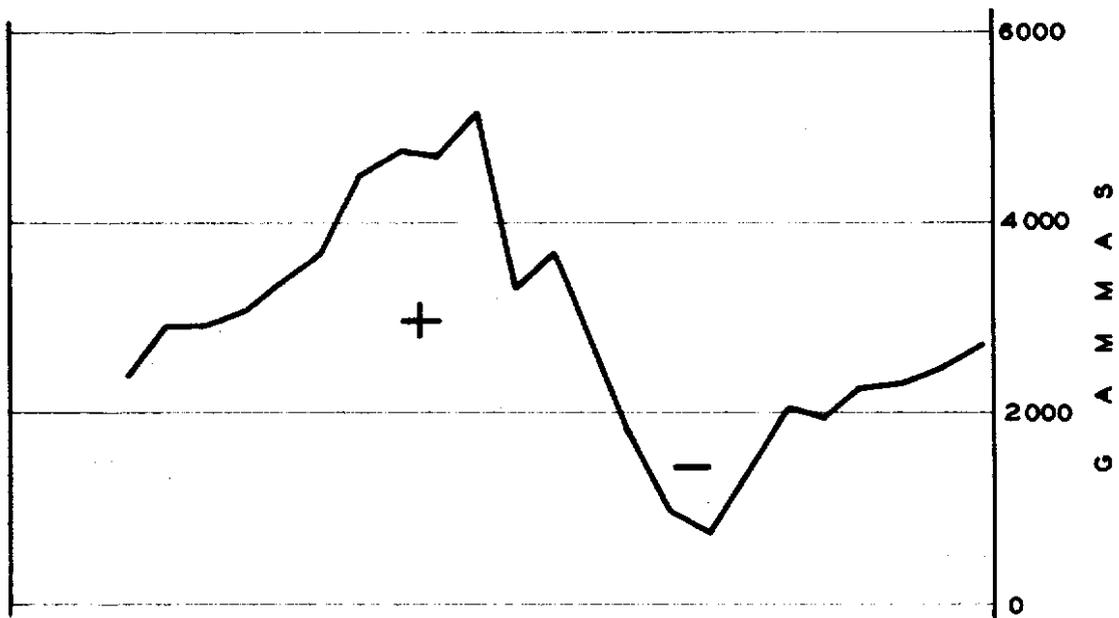
4. ANOMALY 12

Anomaly 12 is sixteen miles south - east of Sheffield, beside the Mersey River. It has an intensity of only 300 gammas above the 2,500 gammas background but further work was required as magnetic sulphides occur in the granite near its contact with the Moina Sandstone.

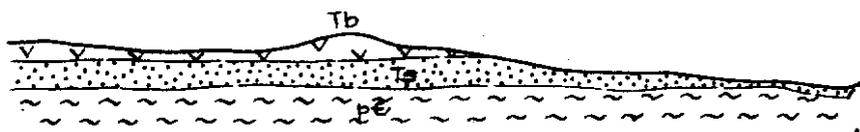
The magnetic profile along the traverse consists of many small irregular variations superimposed on a broad high centred about 1,000 N (See Fig. 5). A 400 gamma anomaly coincides with a 15' wide mineralized zone in granite. There is no SP anomaly over this mineralization and field evidence indicates it has no economic value.

# FIG. 6

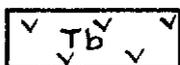
011



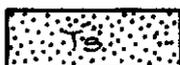
GROUND  
MAGNETIC PROFILE



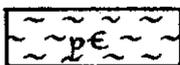
GEOLOGICAL SECTION



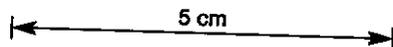
Basalt



Sediments



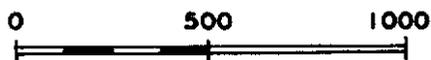
Quartz-muscovite-  
garnet schist



TRAVERSE 5A  
MAGNETIC PROFILE-ANOMALY 67

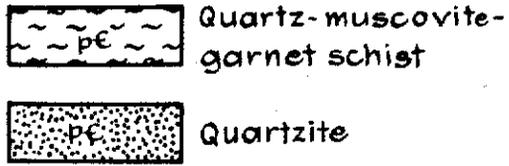
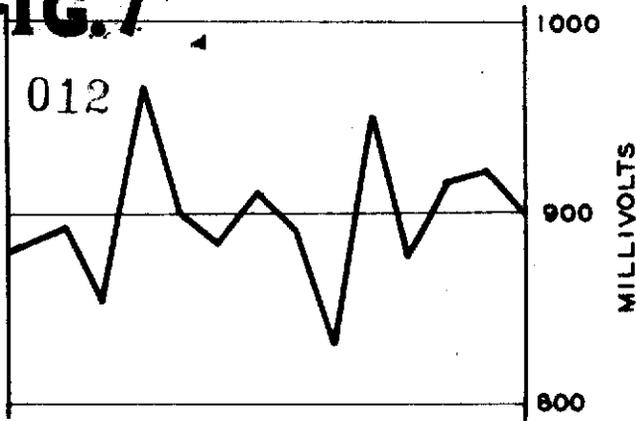
E.L. 15/65 SHEFFIELD, TAS.

SCALE OF FEET

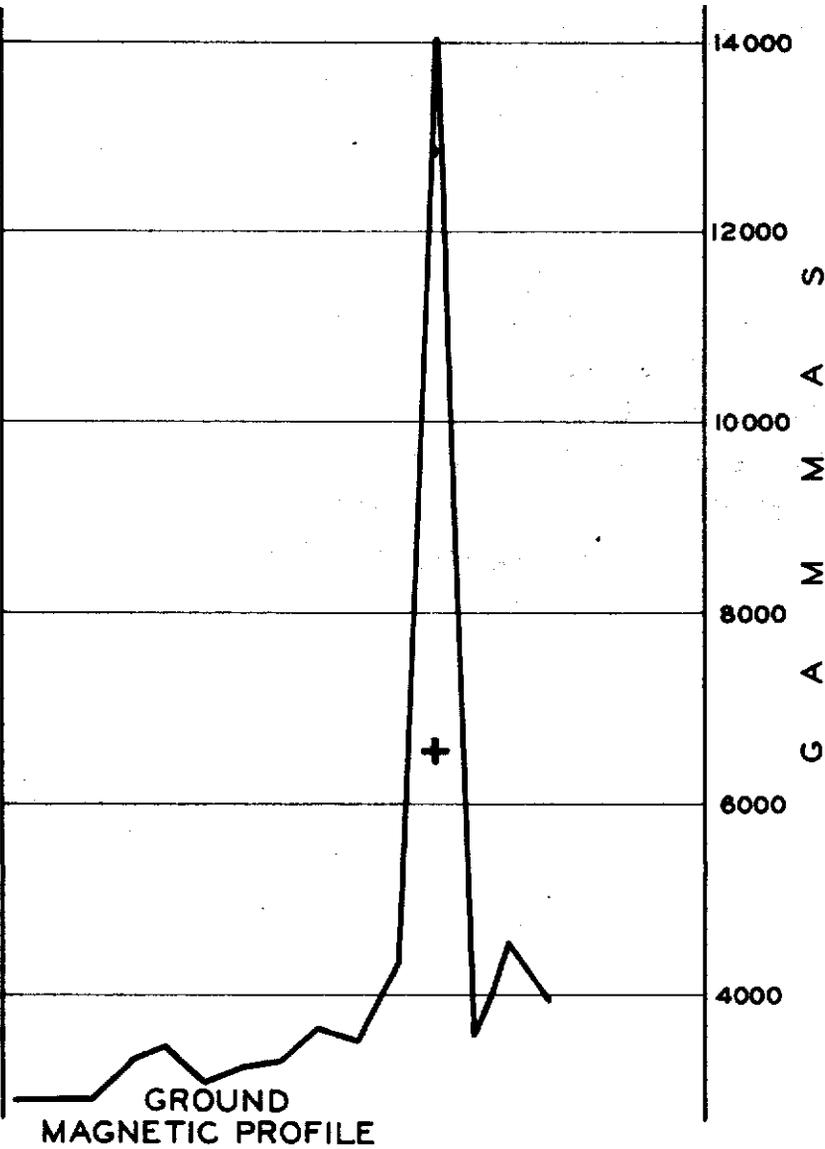


Tsh,8  
A4.1048

FIG. 7



S.P. PROFILE

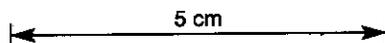
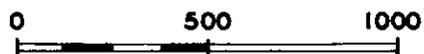


S.P. & MAGNETIC PROFILES  
TRAVERSE 5B-ANOMALY 67  
E.L.15/65 SHEFFIELD, TAS.



GEOLOGICAL SECTION

SCALE OF FEET



Tsh,9  
A4.1049

5. ANOMALY 67

Aeromagnetic anomaly 67 is four miles south of Ulverstone and required further investigation as it may be caused by ultra-basic rocks as these occur several miles to the north. A second traverse was made over a similar aeromagnetic anomaly one mile south of 67.

Tertiary basalt corresponds to the magnetic anomaly and this appears to be the cause of the anomaly (Fig. 6). On the traverse to the south of 67 there is good correlation between the 10,000 gamma anomaly and a narrow band of highly magnetic quartz-magnetite schist and again the anomaly is simply explained.

014

6.

CONCLUSIONS & RECOMMENDATIONS

Each of the five aeromagnetic anomalies investigated was located by ground magnetics and the geology examined. The cause of the anomalies is believed to be magnetite in the following rocks:-

53	-	Spilite
27 & 28	-	? Quartz dolerite
22	-	Basalt
12	-	Granite aureole
67	-	Basalt
		Schist (southern traverse)

Field evidence for these possible causes was not always convincing, mainly due to soil and alluvium cover, and for 27 and 28 was doubtful. Under such circumstances the possibility of mineralization cannot be precluded, although there is no evidence to support it.

Anomalies 22 and 67 are considered adequately explained and no further work on these is justified. Reasonable explanations are available for anomalies 53, 27 and 28 and 12 and geophysical methods probably cannot assist any more, but further investigations on these anomalies is warranted if supporting geological data for possible mineralization is found during later work in E.L.15/65.

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