

366001

Q79 No 21.

GEOLOGY OF AIRBOURNE GEOPHYSICAL
ANOMALY 21/2
JEAN VALLEY

MICROFILMED

59-276

Anomaly 21/12

L.E.G. 4/5/59.

366E

000

LYELL - E.Z. - EXPLORATIONS

366002

687

Q79

4th May,

195⁹

To: Mr. G.F. Hudspeth

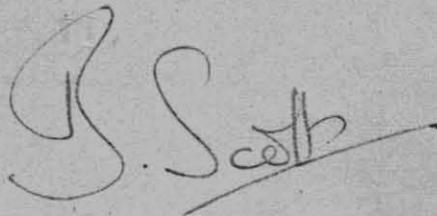
Anomaly 21/12

The accompanying reports describe the geological and geophysical setting of airborne response 21/12.

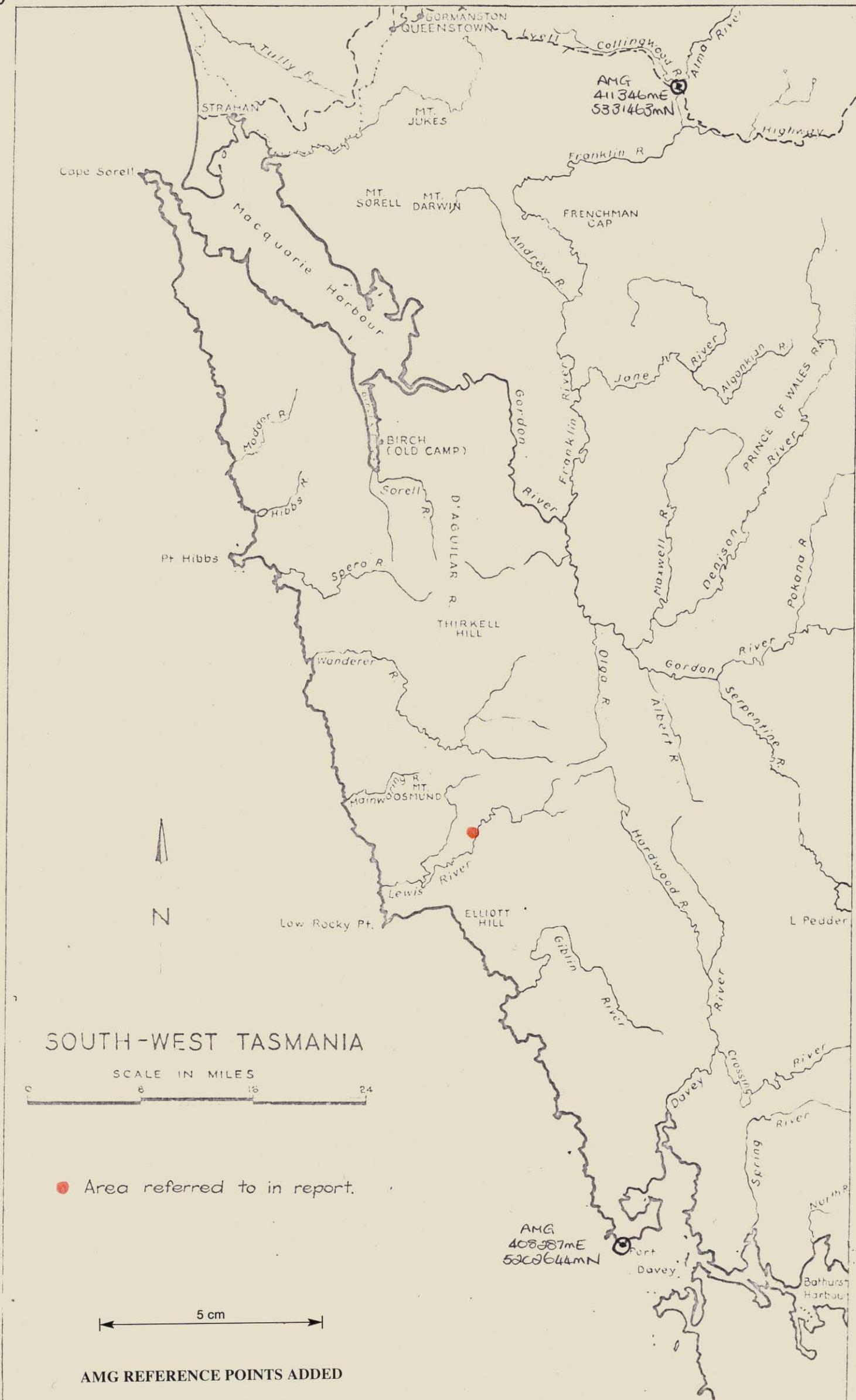
The anomaly is situated entirely within the Precambrian and it was selected on the basis of its strong electromagnetic response and the near-peak correlation with an aeromagnetic high. In the ground investigation although the magnetic response was relocated, the electromagnetic indication was not so clearly outlined and its relocation is open to doubt. However, the geophysical and geological evidence is that there is no economic potential to the anomaly area.

Conclusion

No further work is warranted in the anomaly area.



Chief Geologist, L.E.E.



002

LYELL - E.Z. - EXPLORATIONS

I. GEOLOGY OF AIRBORNE GEOPHYSICAL ANOMALY 21/12.

JEAN VALLEY

1. Date of Investigation: 20.3.59 to 27.2.59

2. Man Days in the Field: 26

Personnel:

Geologist:	I.M. Paltridge
Geophysicist:	I.M. Sefton
Bushmen:	T.N. Burrell
	D. Scott
	R.J. Bennett

3. Location: The anomaly is situated south of Moore's Lookout about half way between the Wanderer and Lewis Rivers (Eate 25R) and about 23 miles south of Birch. It is entirely within Precambrian mica-schists and metaquartzites. The anomaly is covered by air photo 24/923/54.

4. Topography
The relief here is quite considerable and the topography is completely controlled by the underlying rock types. Vegetation is moderate.

5. GEOLOGY
This is shown on plate Q31/1.

Lithology

The Precambrian rocks here are of three types:

- (a) hard white metaquartzites;
- (b) softer quartz mica schists;
- (c) puggy micaceous clays.

The last, which is waterlogged, is responsible for the E.M. indications on the northern line.

Structure

A probable strike fault has been mapped on the western side of the grid.

Bedding dips consistently to the west at moderate to steep angles and the rocks seem to form part of a major overturned anticline whose axis lies some distance to the east.

Mineralisation

No mineralisation was seen in the area.

Conclusions

The E.M. anomaly is due to waterladen micaceous clays and no further work is warranted.

I. Michael Paltridge

003

LYELL - E.Z. - EXPLORATIONS

366005

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II. GEOCHEMICAL INVESTIGATION 21/12

Sampling

Soil samples 1393 to 1443, lot 20, were collected and analysed for copper, lead and zinc.

The analyses show certain very minor concentrations of lead but none of copper or zinc. In view of the fact that E.M. methods failed to detect any mineralisation with which the concentrations might be associated, it is concluded that they are of no economic significance.

J. Michael Patridge

004

366006

23rd April, 9

A.E.M. Anomaly 21/12

By reason of variations in flight line spacing, this air anomaly is virtually a one-line response. Lines 540 and 541 are coincident to within 50' at the point of recording, and adjacent lines show no significant indications of strike. The two lines confirm repeatability of the anomaly; best expression line 541: 0.9 degrees phase shift at 490' in a ratio of 1.0.

Although it occurs well in the Precambrian, the anomaly is distinguished by near-peak correlation with an aeromagnetic high, albeit broad and regional in character.

In ground electromagnetic traversing, only one conductor intersection was established, although two weak indications were obtained on line 4S. The former, as a conducting horizon, dips about 60 degrees grid East and is of fair dip extent, but as a disturbing field, it is rather too small to account for the air response.

The aeromagnetic expression was defined on the ground as a peak 220 gamma anomaly dipping steeply grid East. It broadens to the South, possibly plunges in that direction as pole depths increase from circa 250' GL to 400' on 4S.

The gravimetric setting is complex: postulated structure is based on little evidence, yet appears the most probable. Bedding is assumed to be reflected by the trends in the magnetics. In such an event, the conductor North and the electrical indications South are not directly connected to a single feature but to separate structural "breaks".

Q31

inch

005

The grid area is underlain by meta-quartzites of a relatively low density, gravimetrically determined at about 2.25 gms/cc. No explanation of the magnetic activity is apparent at surface, a fact which has necessitated a closer geophysical interpretation.

The peak magnetic ridge correlates with a severely local gravity expression of 0.1 mgal positive residual magnitude across all lines. A second parallel and more minor magnetic axis evidently occurs to the West, again in correlation with a similar gravity feature. However, free magnetic minerals appear precluded as a common cause since magnitudes and anomaly forms are incompatible. For example, the gravimetric expression presumes a near-surface source, the magnetics so not. Again the magnetic intensities are incommensurate with simple occurrences of magnetite and/or possibly pyrrhotite at the indicated depths at the indicated densities. As the electrical results do not allow appreciable concentrations of sulphides near-surface, magnetic or non-magnetic, the most probable eventuality is a bedded horizon paramagnetic and in a low density contrast with the country rock, e.g. an iron formation. In this case dips on line 4N may change to grid West from the South.

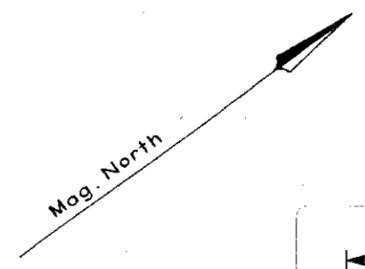
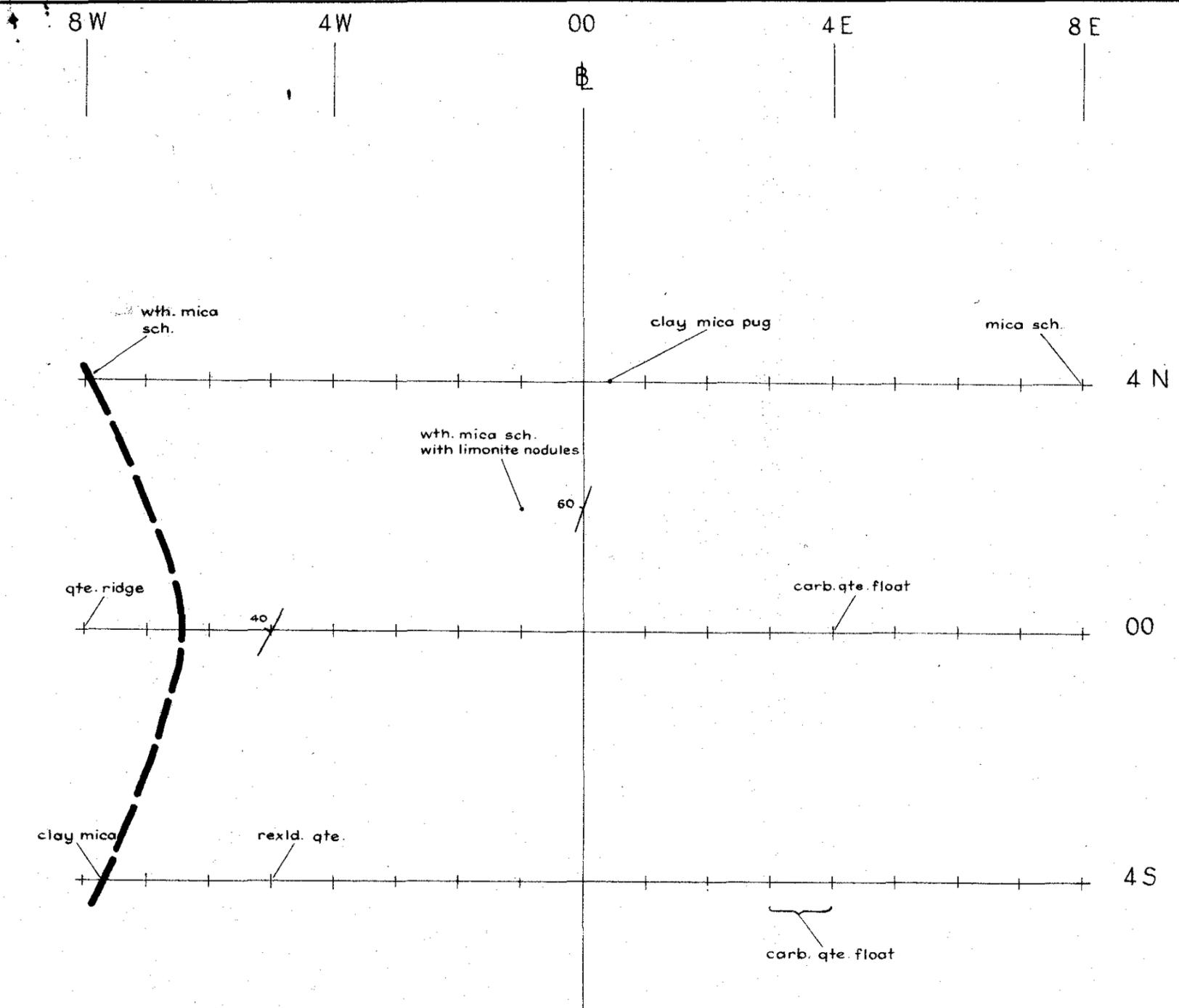
Although the air-anomaly has not been ground-located with certainty - the conductor on line 4N could well develop into a stronger zone - the evaluation of the aeromagnetic high discounts any economic potential suggestive to the setting.

J. B. Boniwell

J.B. BONIWELL

Q31

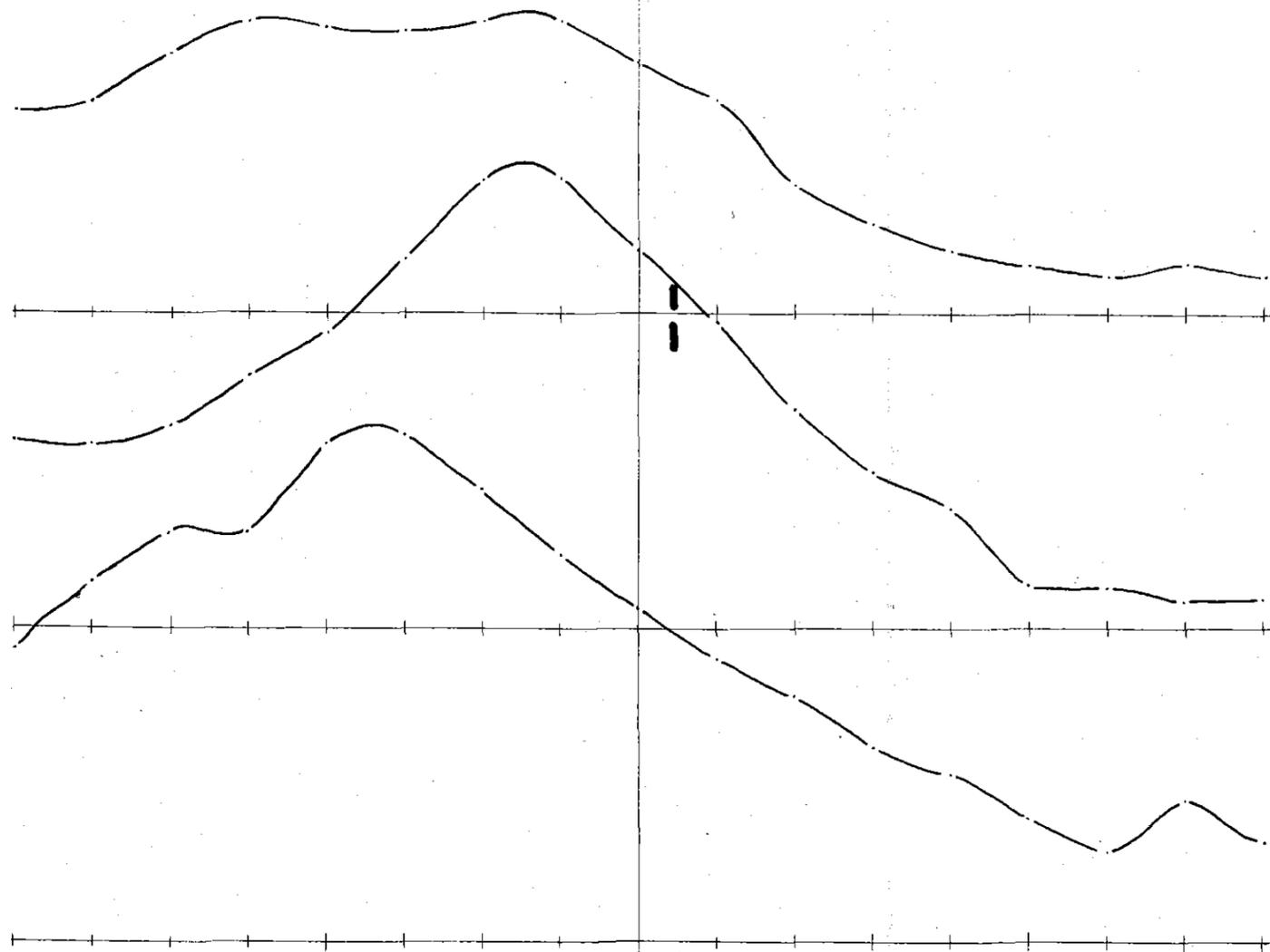
inch



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References	LYELL E.Z. EXPLORATIONS QUEENSTOWN				
	ANOMALY 21/12				
GEOLOGY	Survey			Scale	2295
	Geology	I.M.P.	Apr '59	200 ft. to 1 inch	
	Geophysics				
	Geochemistry				
	Drawn	I.M.P.	Apr '59		
	Traced	D.S.	May '59	Q31	Sheet
Checked by: <i>[Signature]</i>					Date:
				Date:	14.7.59

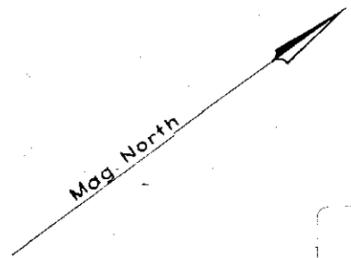
8W 4W 00 4E 8E



4 N

00

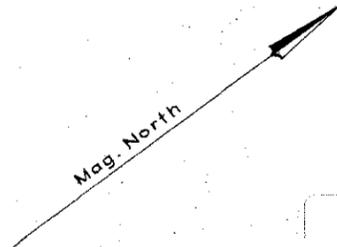
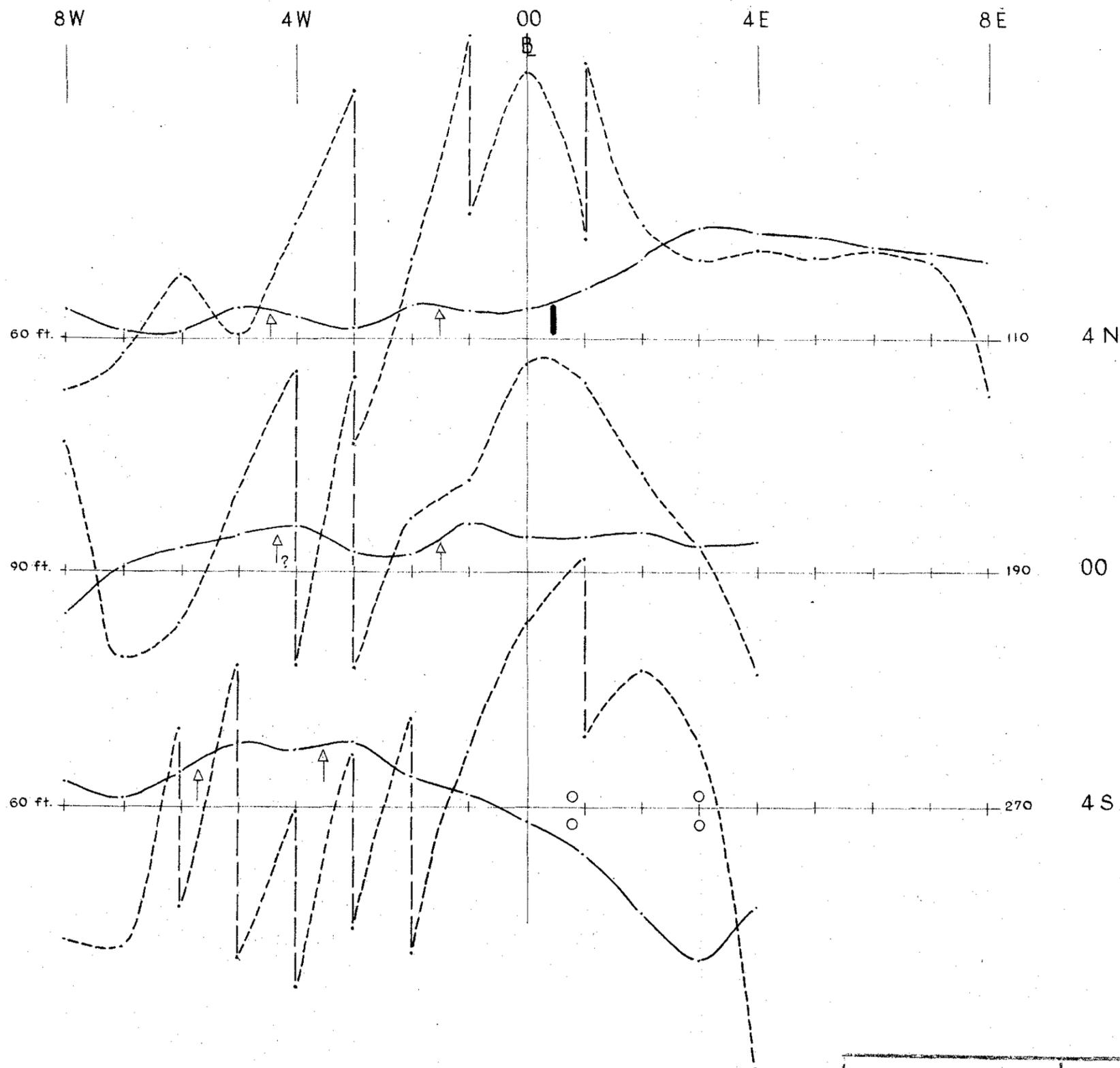
4 S



366009

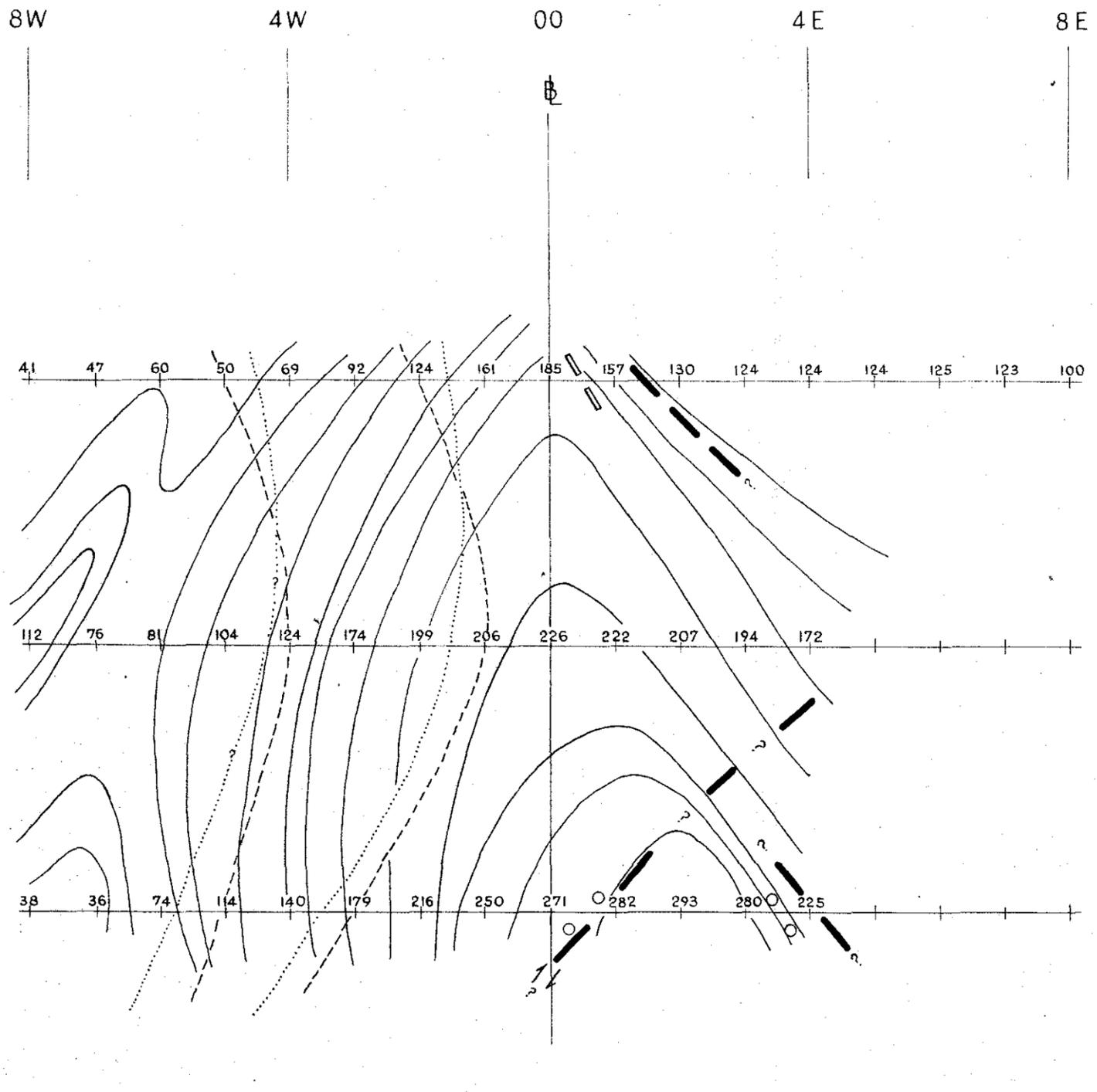
59-276

References		LYELL E.Z. EXPLORATIONS QUEENSTOWN			
ANOMALY 21/12					
Survey			Scale	2296	
Geology			Hor. 200 ft. to 1 inch Vert. 100 ft. to 1 inch	Q31	3
Geophysics	T.N.B.	Apr. '59			
Geochronology			Date	14.7.59	
Drawn	I.M.S.	Apr. '59			
Traced	D.S.	May '59			
MAGNETIC					



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References		366010 LYELL E.Z. EXPLORATIONS QUEENSTOWN					
— Bouguer Gravity		ANOMALY 21/12					
- - - Topography				2297			
E.M. Axis				Q31	Sheet		
↑ Mag. High Axis					No.	4	
BOUGUER GRAVITY		Survey		Scale			
		Geology		Hor.			
		Geophysics	I.M.S.	Apr. '59	200' to 1"		
		Geochemistry			Vert.		
		20' to 1"			Δg		
Drawn	J.B.B.	Apr. '59	1" = 1.0 mgal	Checked by: <i>[Signature]</i>			
Traced	D.S.	May '59		Date: 14.7.59			



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References		LYELL E.Z. EXPLORATIONS		QUEENSTOWN	
Topographic contours C.I. 20 ft.		<h1 style="text-align: center;">ANOMALY 21/12</h1> <p style="text-align: center;">STRUCTURAL INTERPRETATION FROM GRAVITY</p>			
Magnetic Axes					
Gravimetric Axes		Survey		Scale	
EM Axis		Geology		2298	
Fault Axes		Geophysics		200 ft to 1 inch	
GRAVITY		Geochemistry			
		Drawn		Q31 Sheet No. 4a	
		Traced			
		Checked by: <i>J.B.B.</i>		Date: 14.7.59	

8W

4W

00

4E

8E



4N

00

4S

Mag. North

5 cm

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LYELL E.Z. EXPLORATIONS
QUEENSTOWN

ANOMALY 21/12

— 1000 cps
 - - - 5000 cps

VERTICAL COIL

Survey			52'e	2299
Geology			Hor.	Q31 10
Geophysics	I.M.P.	Apr '59	200 ft. to 1 inch	
Geology			Vert.	
Geophysics	I.M.P.	Apr '59	20° to 1 inch	
Geology	D.S.	May '59		