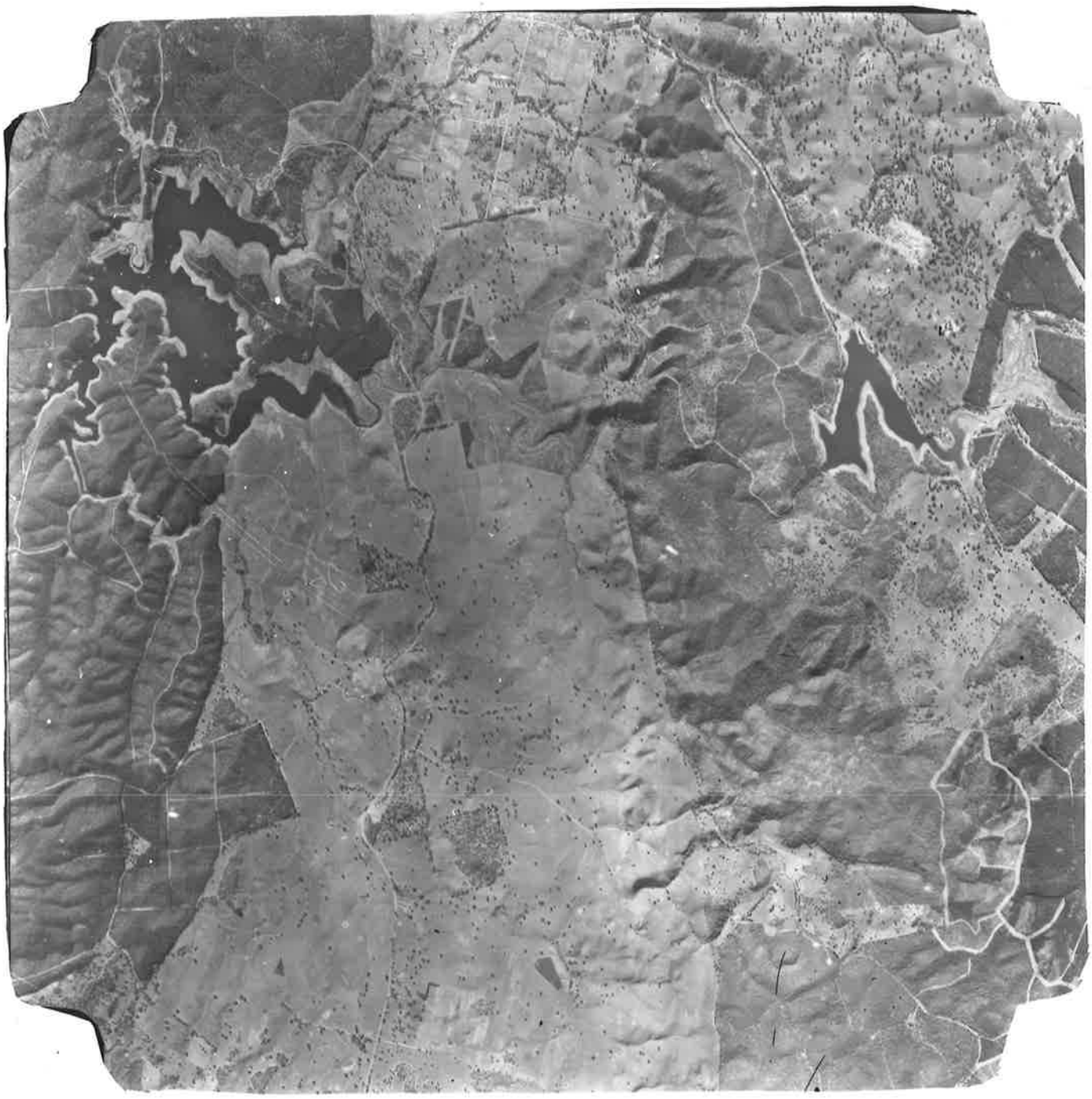
FIG.1
LOCALITY MAP
SCALE 1:250,000

FIG. 2
ACCESS

Scale 1:50,000



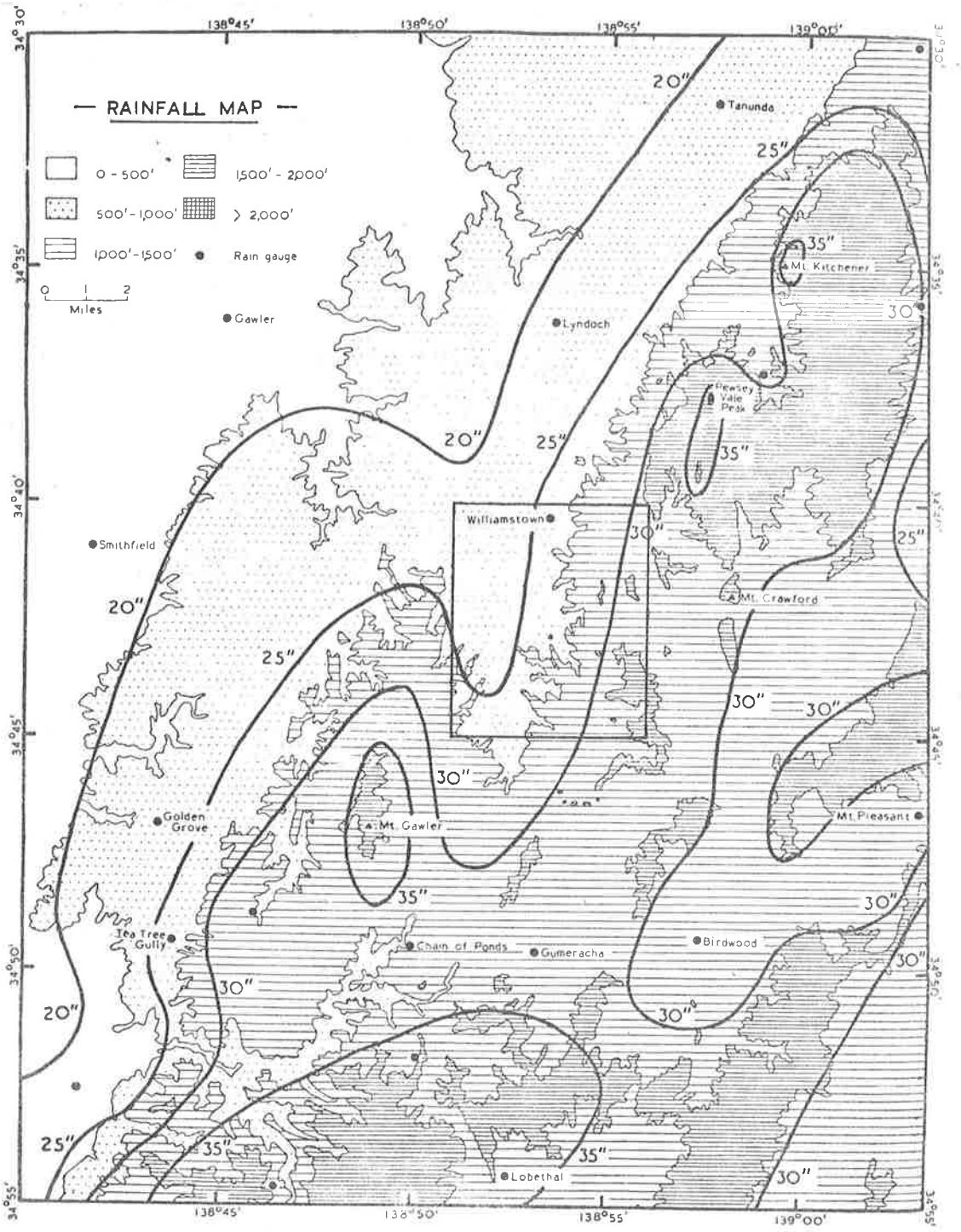


Fig. 3. Rainfall-altitude map (after Specht et al., 1961).

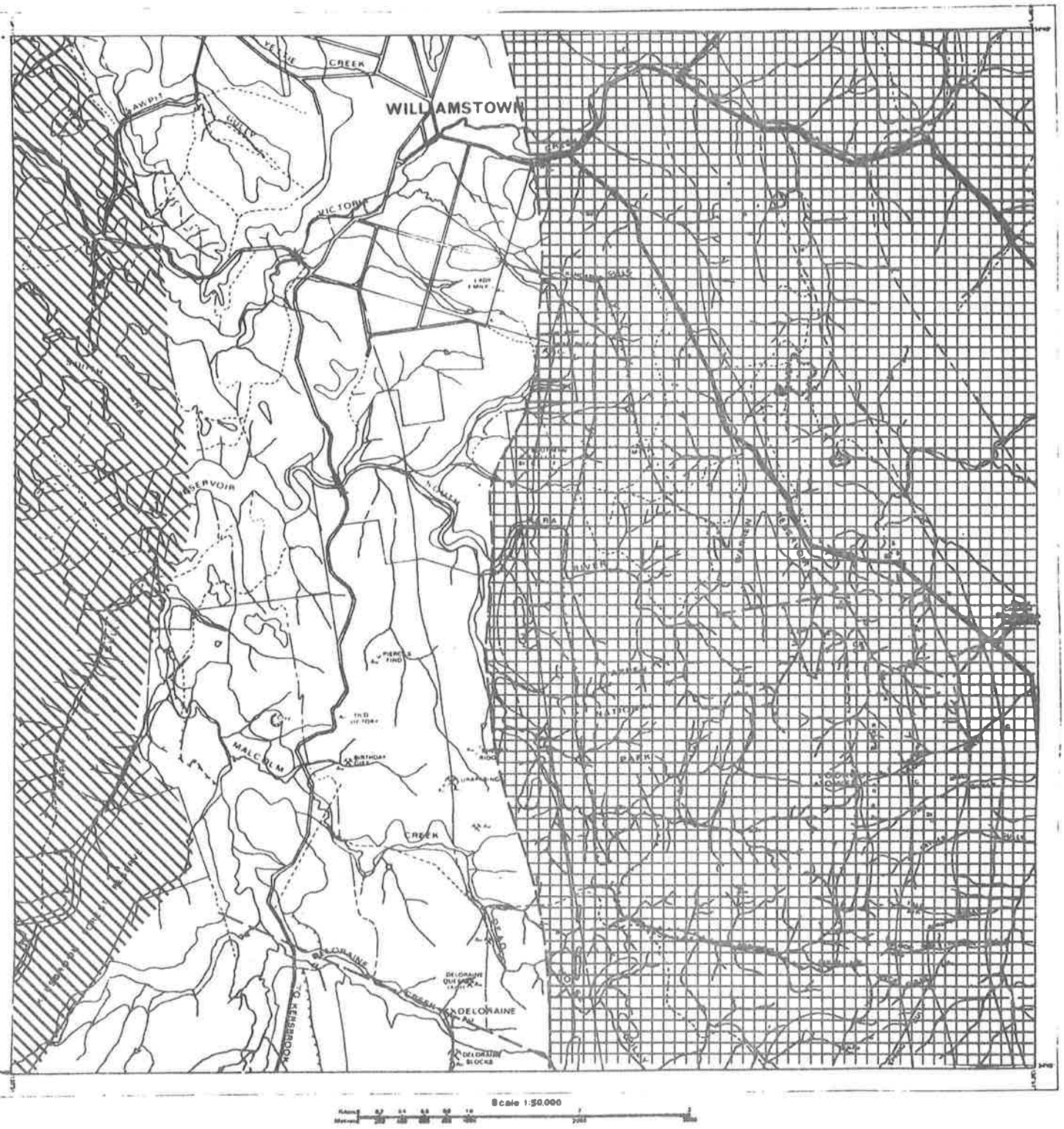


FIG.4 : PHYSIOGRAPHY

KERSBROOK FOREST RESERVE

WILLIAMSTOWN – KERSBROOK VALLEY

WARREN RESERVE

FIG.5

SITE QUALITY PINUS RADIATA RELATED TO GEOLOGY
(after Woods, 1962)

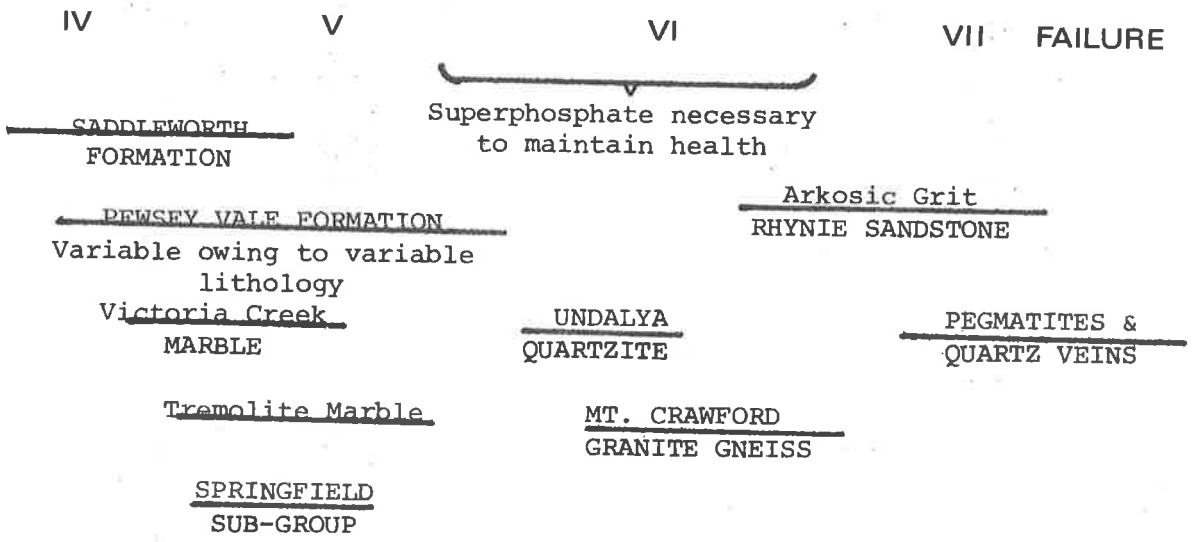


FIG.6

SITE QUALITY PINUS RADIATA RELATED TO NATURAL VEGETATION
(Woods, 1962)

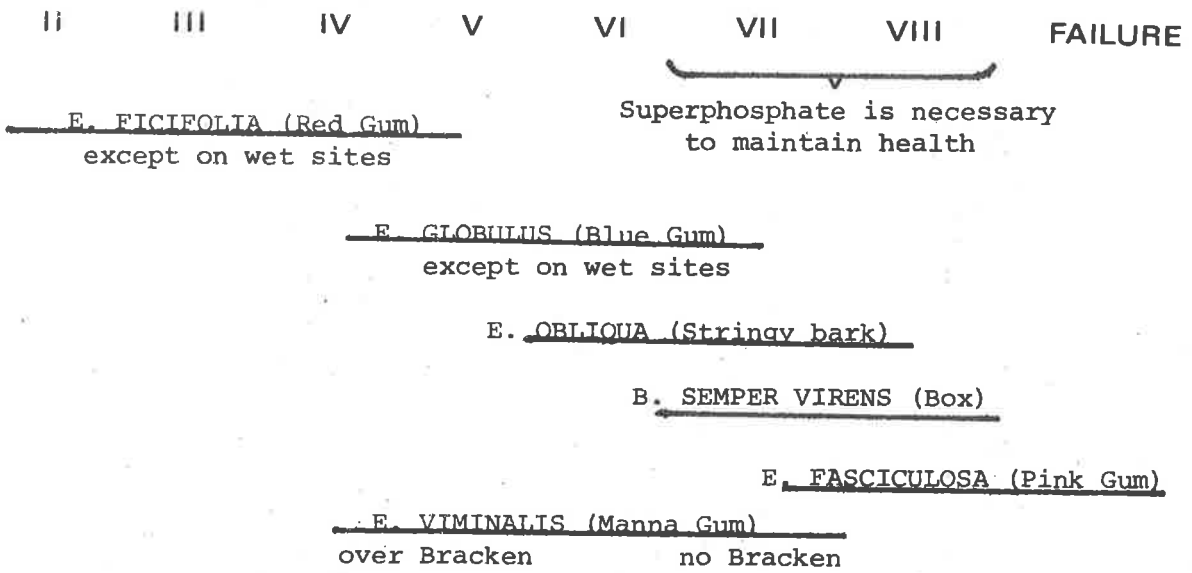
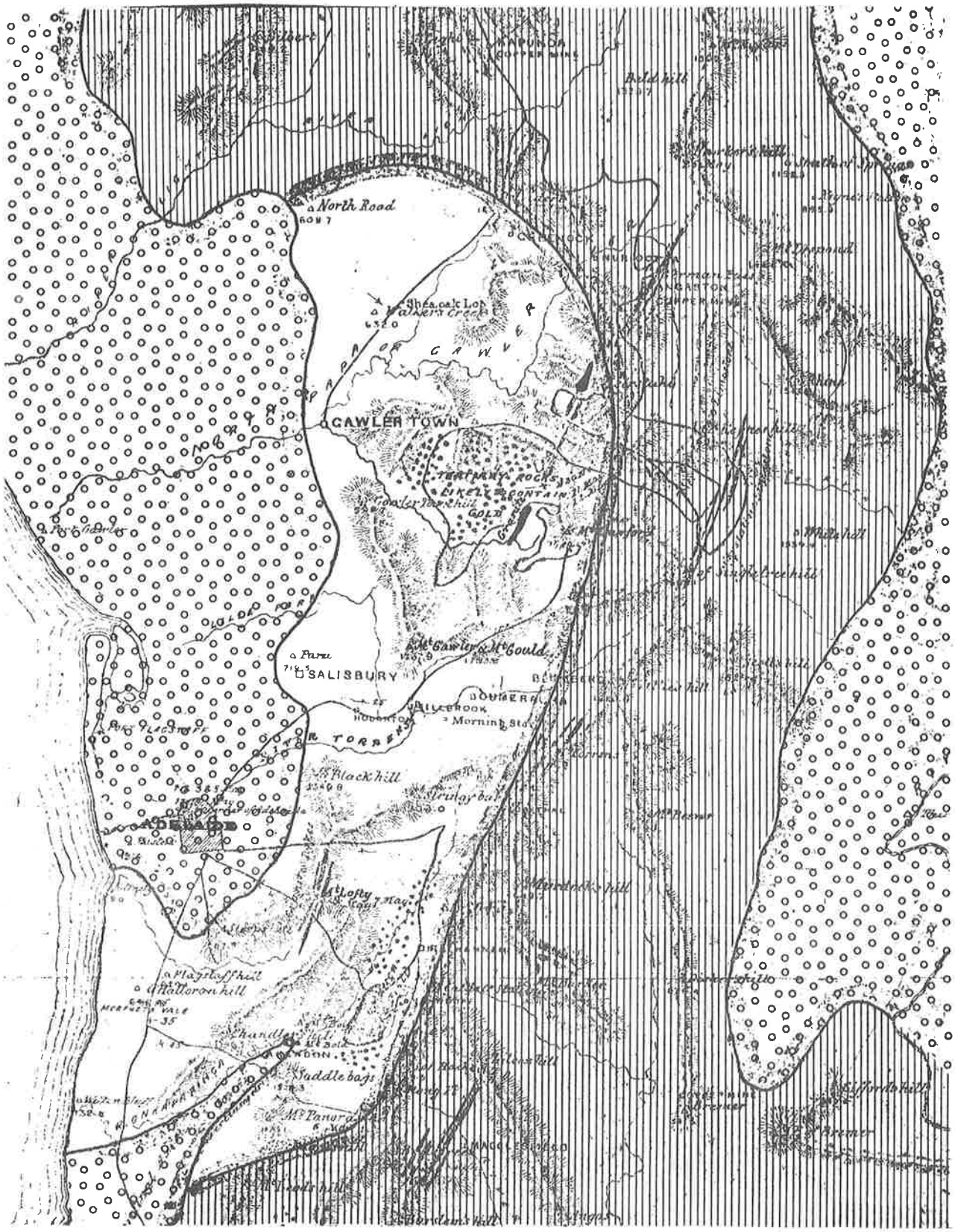


FIG.7



PORTION OF GEOLOGICAL MAP OF
SOUTH AUSTRALIA BY A.R.C. SELWYN 1859

TERTIARY

GRANITE

PALAEOZOIC ROCKS

SECOND STAGE

FIRST STAGE

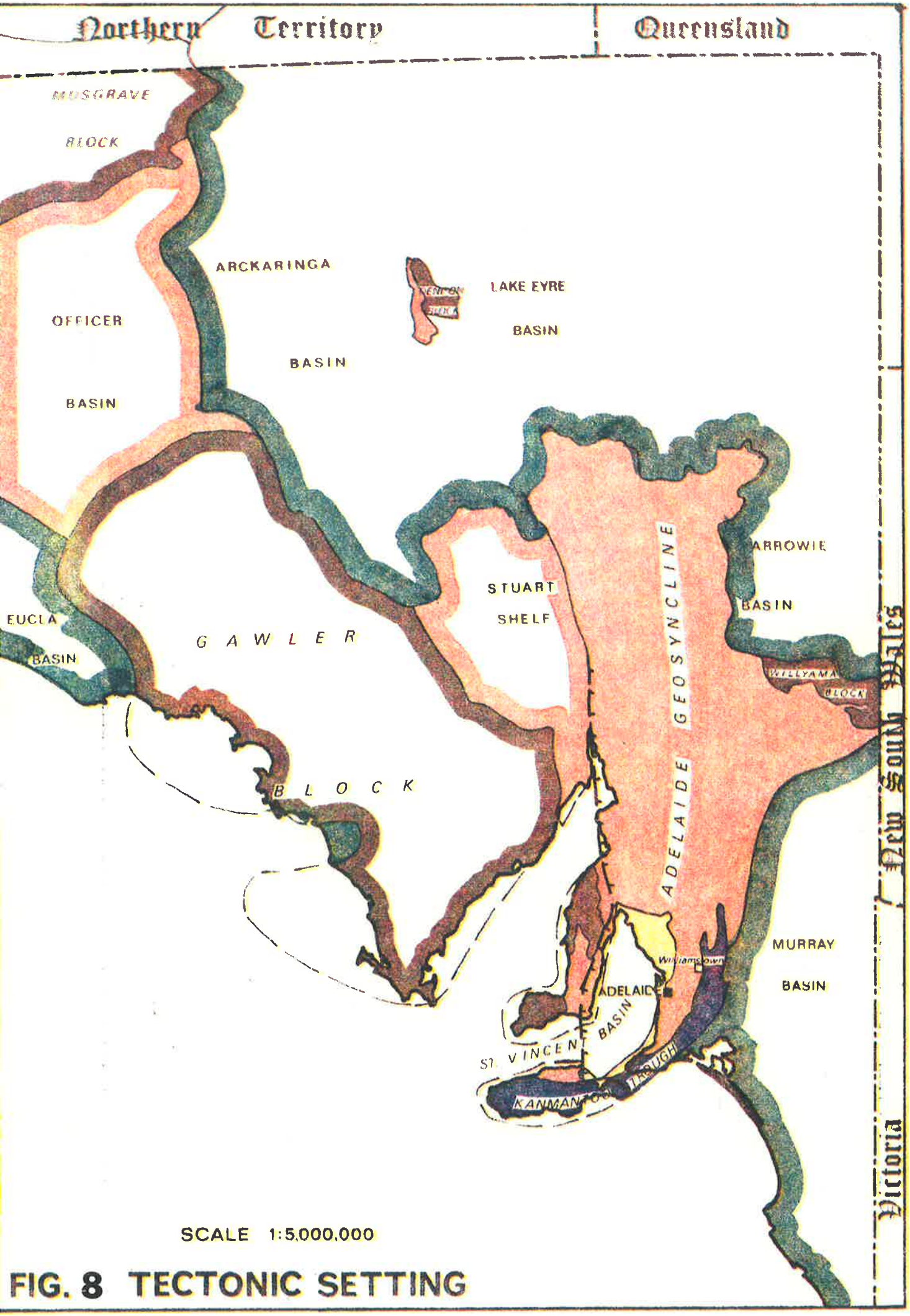


FIG. 8 TECTONIC SETTING

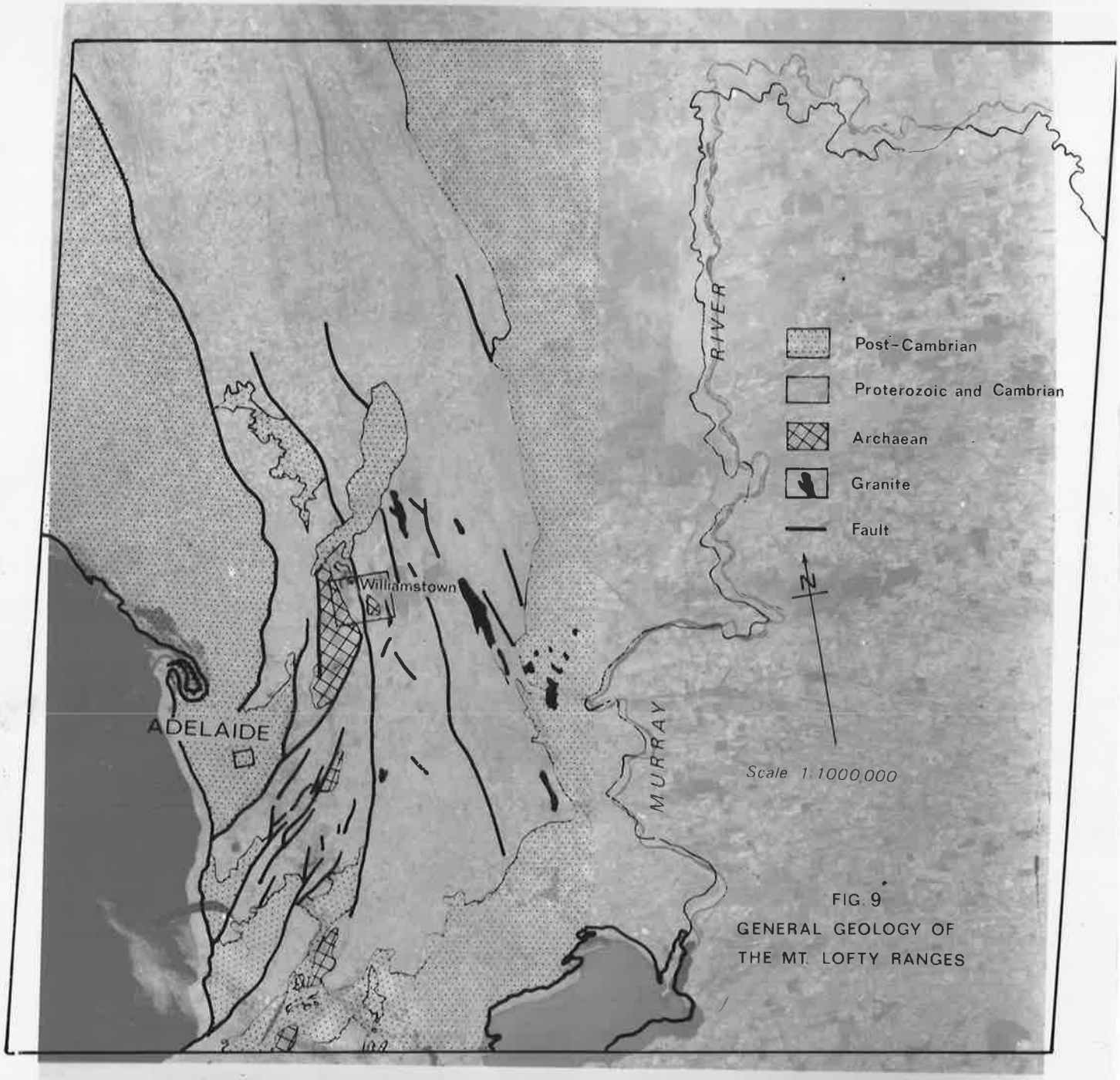


FIG. 9
GENERAL GEOLOGY OF
THE MT. LOFTY RANGES

STRATIGRAPHIC COLUMN AND CORRELATION CHART

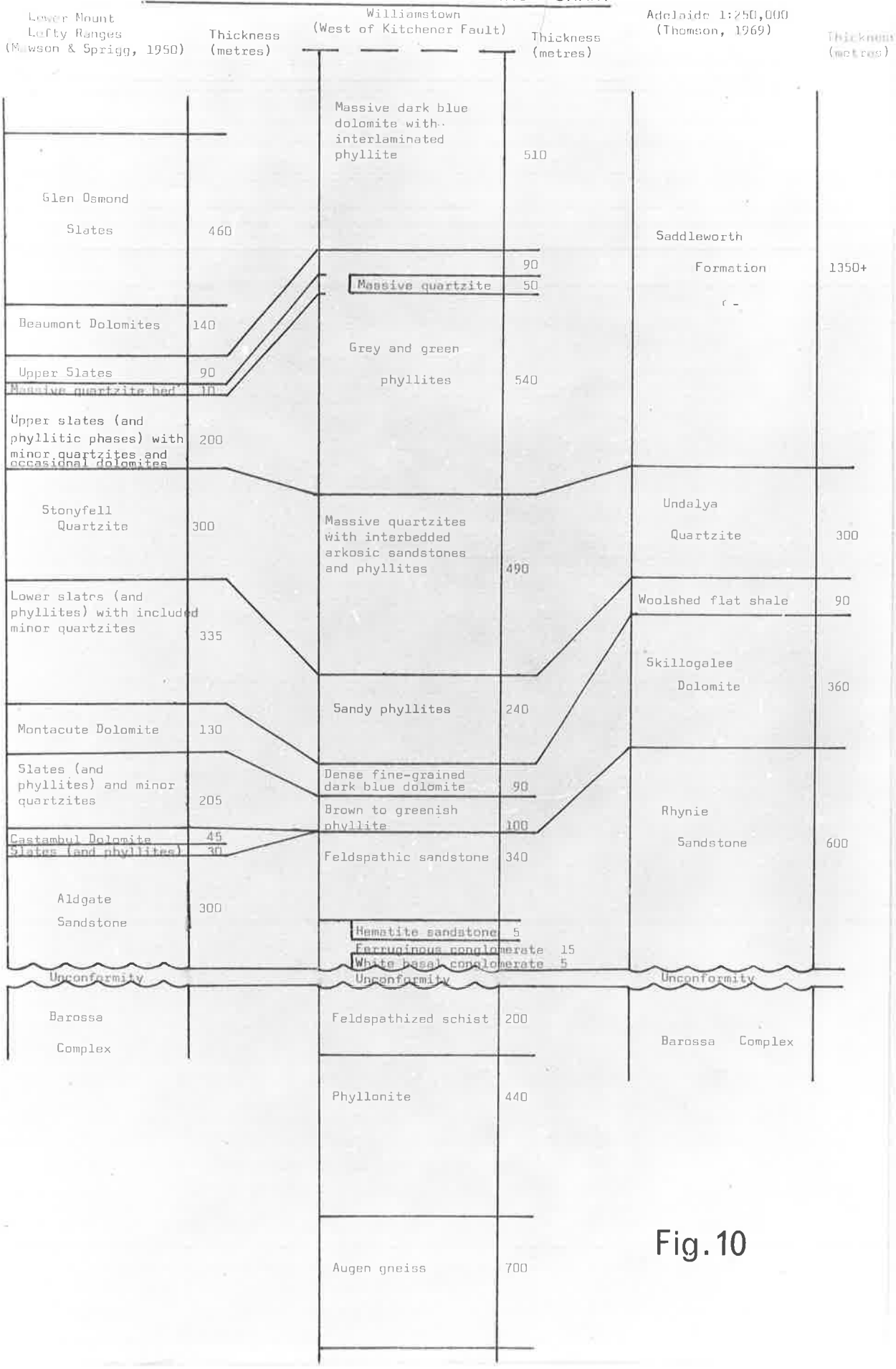
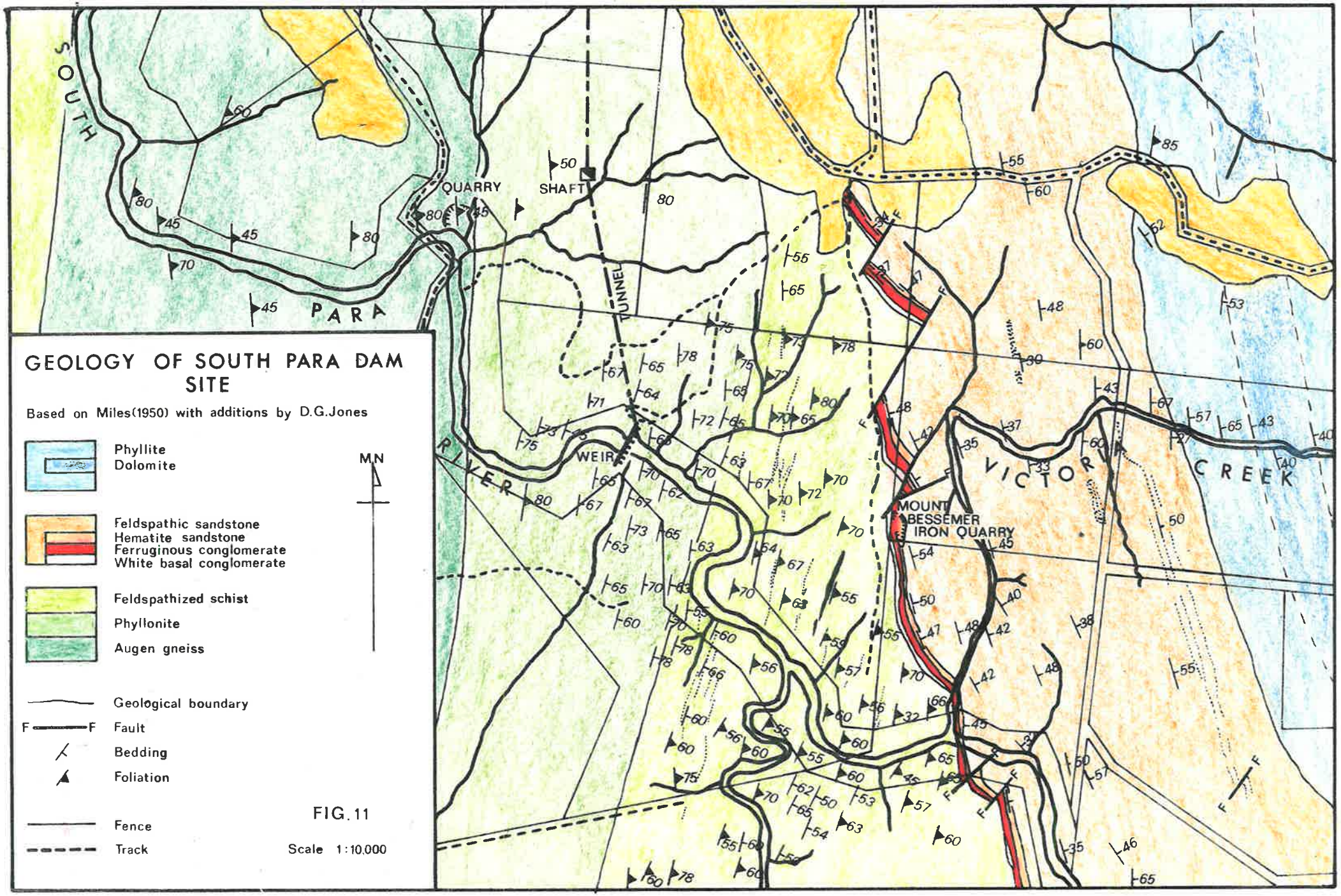
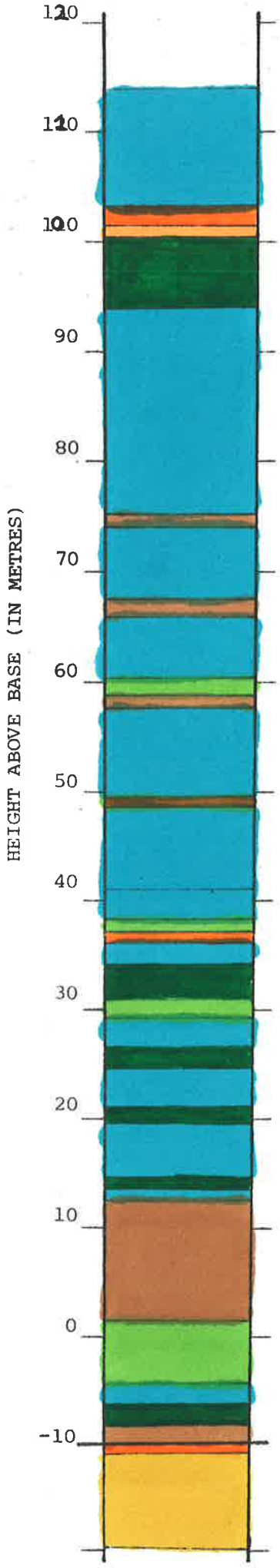


Fig. 10


SOUTH
PARA
QUARRY
SHAFT
TUNNEL
WEIR
RIVER
VICTORIA
CREEK
MOUNT BESSEMER IRON QUARRY
MN
GEOLOGY OF SOUTH PARA DAM SITE
Based on Miles(1950) with additions by D.G.Jones
Phyllite
Dolomite
Feldspathic sandstone
Hematite sandstone
Ferruginous conglomerate
White basal conglomerate
Feldspathized schist
Phyllonite
Augen gneiss
Geological boundary
Fault
Bedding
Foliation
Fence
Track
FIG. 11
Scale 1:10,000

SADDLEWORTH FORMATION

Sequence above Quartzite Marker in vicinity of Deloraine Mine



DOLOMITE: dense pale grey marble, fine to coarse-grained, with disseminated pyrite.

PHYLLITIC DOLOMITE: greenish-grey marble with thin bands of interbedded phyllite.

CALCAREOUS PHYLLITE: hard grey carbonate-rich phyllite with thin interbeds of marble.

PHYLLITE: grey well-bedded to fissile phyllite, often pyritic.

SANDY PHYLLITE: pale brown to pale grey, friable with disseminated pyrite.

SANDSTONE: pale brown to white, often pyrite.

QUARTZITE: dense, hard white, with calcareous cement and calcite veins.

Compiled from re-examination of S.A. Dept. of Mines diamond drill cores, together with surface and limited underground mapping by D.G. Jones.

FIG. 12

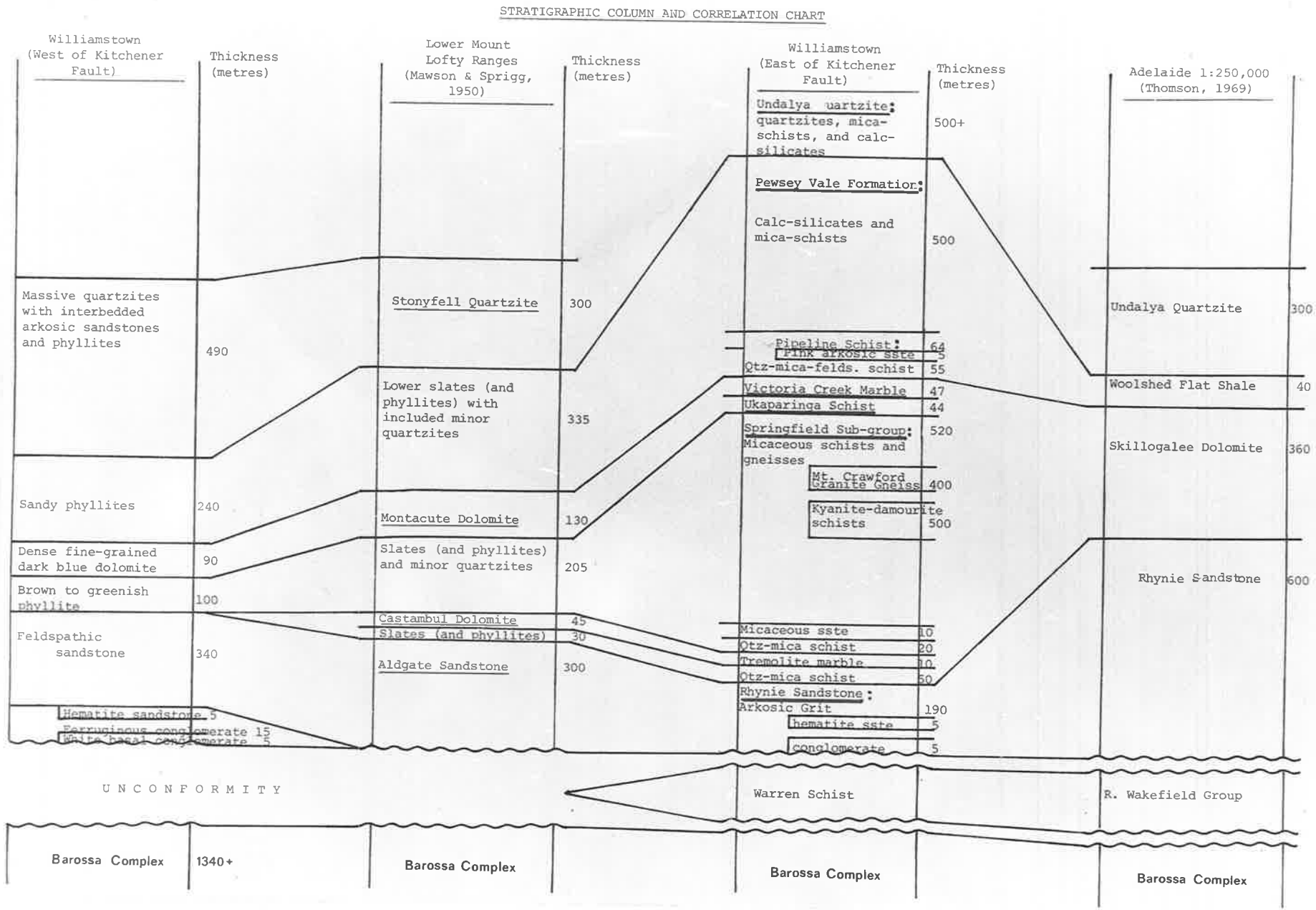
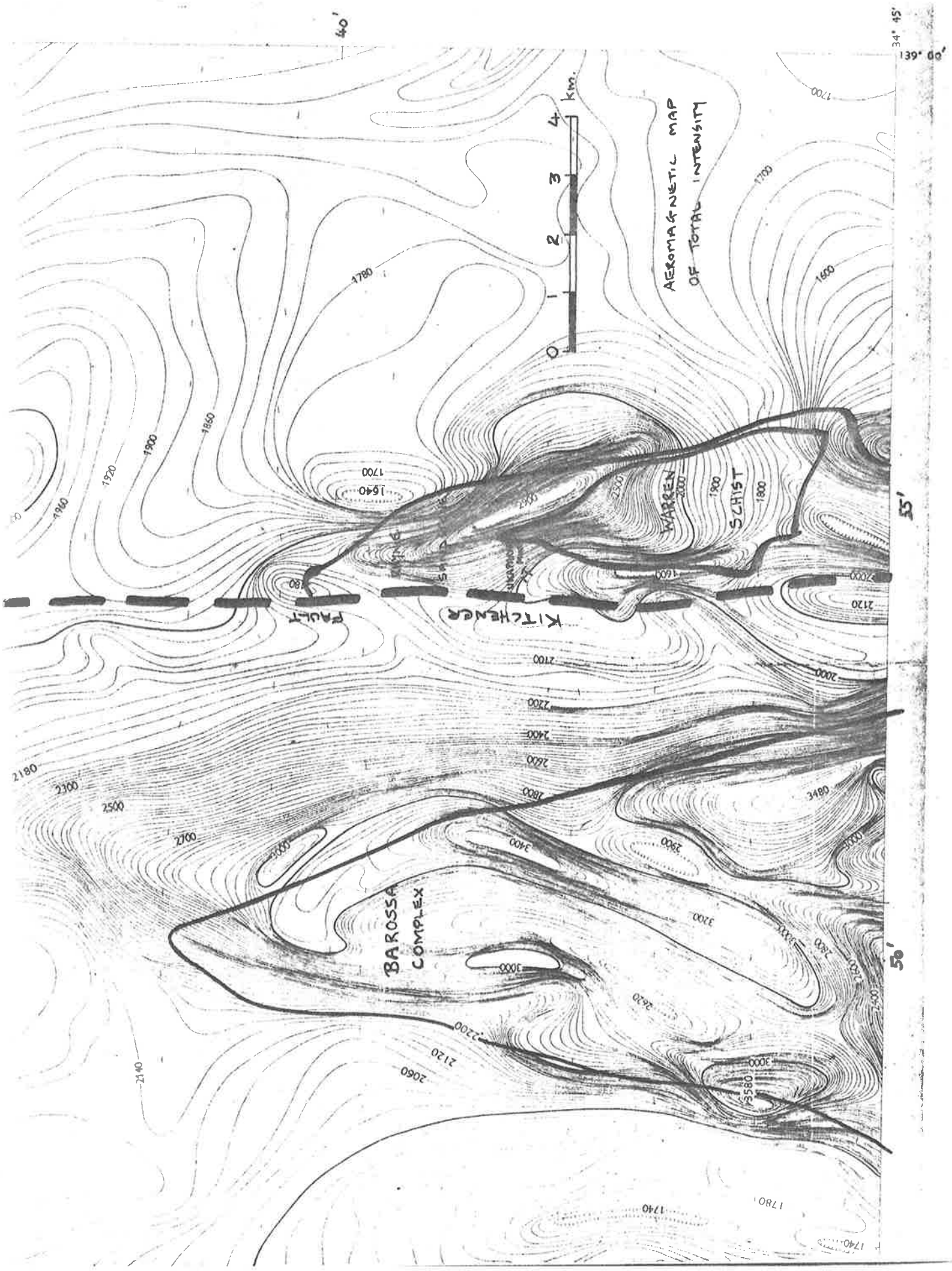

STRATIGRAPHIC COLUMN AND CORRELATION CHART
Williamstown (West of Kitchener Fault)
Thickness (metres)
Massive quartzites with interbedded arkosic sandstones and phyllites
490
Sandy phyllites
240
Dense fine-grained dark blue dolomite
90
Brown to greenish phyllite
100
Feldspathic sandstone
340
Hematite sandstone 5
Ferruginous conglomerate 15
White basal conglomerate 5
Lower Mount Lofty Ranges (Mawson & Sprigg, 1950)
Thickness (metres)
Stonyfell Quartzite
300
Lower slates (and phyllites) with included minor quartzites
335
Montacute Dolomite
130
Slates (and phyllites) and minor quartzites
205
Castambul Dolomite
45
Slates (and phyllites)
30
Aldgate Sandstone
300
Williamstown (East of Kitchener Fault)
Thickness (metres)
Undalya Quartzite: quartzites, mica-schists, and calc-silicates
500+
Pewsey Vale Formation:
Calc-silicates and mica-schists
500
Pipeline Schist:
64
Pink arkosic sste
5
Qtz-mica-felds. schist
55
Victoria Creek Marble
47
Ukaparinga Schist
44
Springfield Sub-group:
520
Micaceous schists and gneisses
Mt. Crawford Granite Gneiss
400
Kyanite-damourite schists
500
Micaceous sste
10
Qtz-mica schist
20
Tremolite marble
10
Qtz-mica schist
50
Rhynie Sandstone:
Arkosic Grit
190
hematite sste
5
conglomerate
5
Adelaide 1:250,000 (Thomson, 1969)
Undalya Quartzite
300
Woolshed Flat Shale
40
Skillogalee Dolomite
360
Rhynie Sandstone
600
UNCONFORMITY
Warren Schist
R. Wakefield Group
Barossa Complex
1340+
Barossa Complex
Barossa Complex
Barossa Complex

Fig. 13

FIG.14


AEROMAGNETIC MAP
OF TOTAL INTENSITY
0
1
2
3
4 km.
WARREN SCHIST
KITCHENER FAULT
BAROSSA COMPLEX
139° 00'
34' 45'
40'
55'
50'

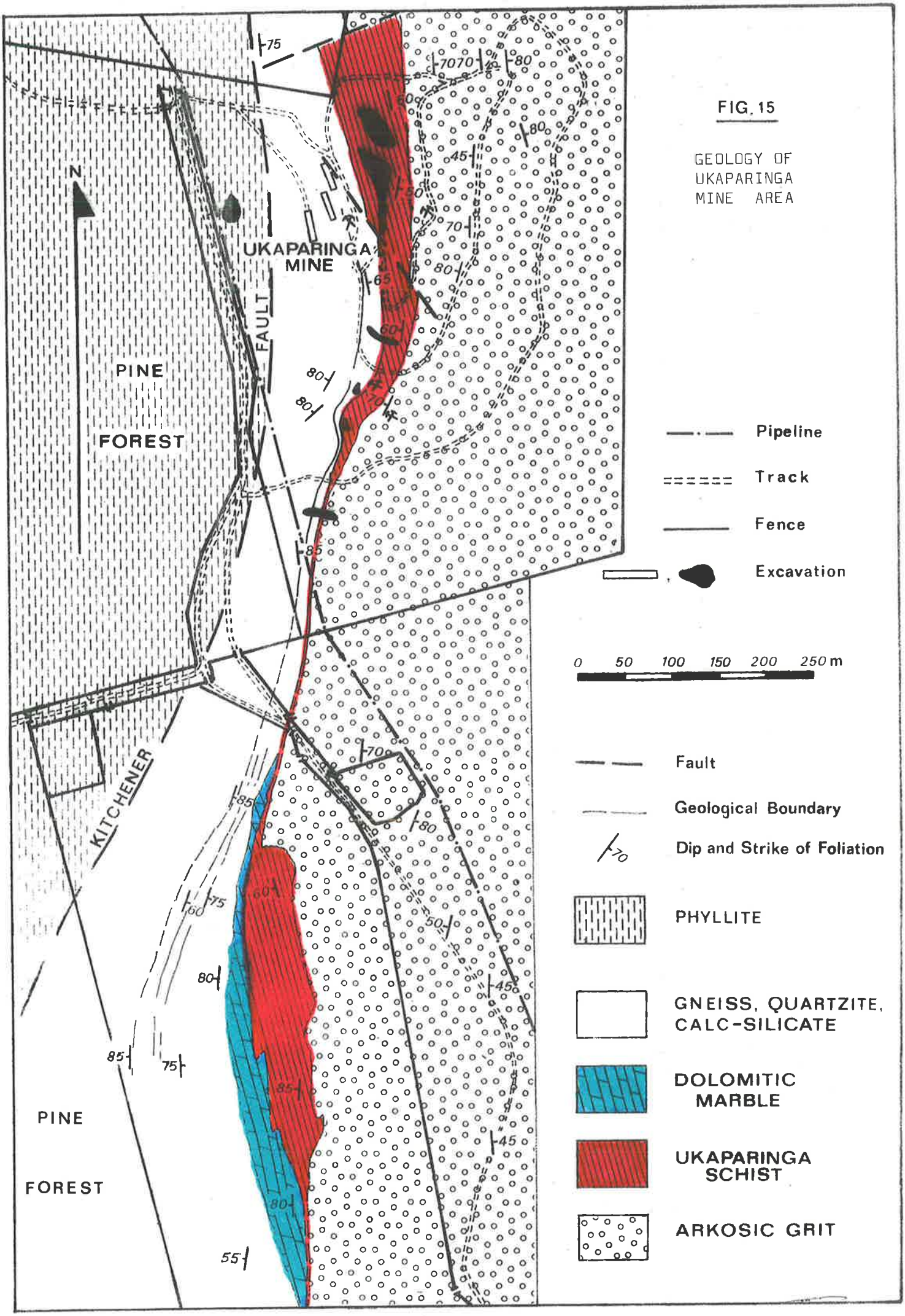


FIG. 15
GEOLOGY OF UKAPARINGA MINE AREA
N
UKAPARINGA MINE
FAULT
PINE FOREST
KITCHENER
PINE FOREST
Pipeline
Track
Fence
Excavation
0 50 100 150 200 250 m
Fault
Geological Boundary
Dip and Strike of Foliation
PHYLLITE
GNEISS, QUARTZITE, CALC-SILICATE
DOLOMITIC MARBLE
UKAPARINGA SCHIST
ARKOSIC GRIT

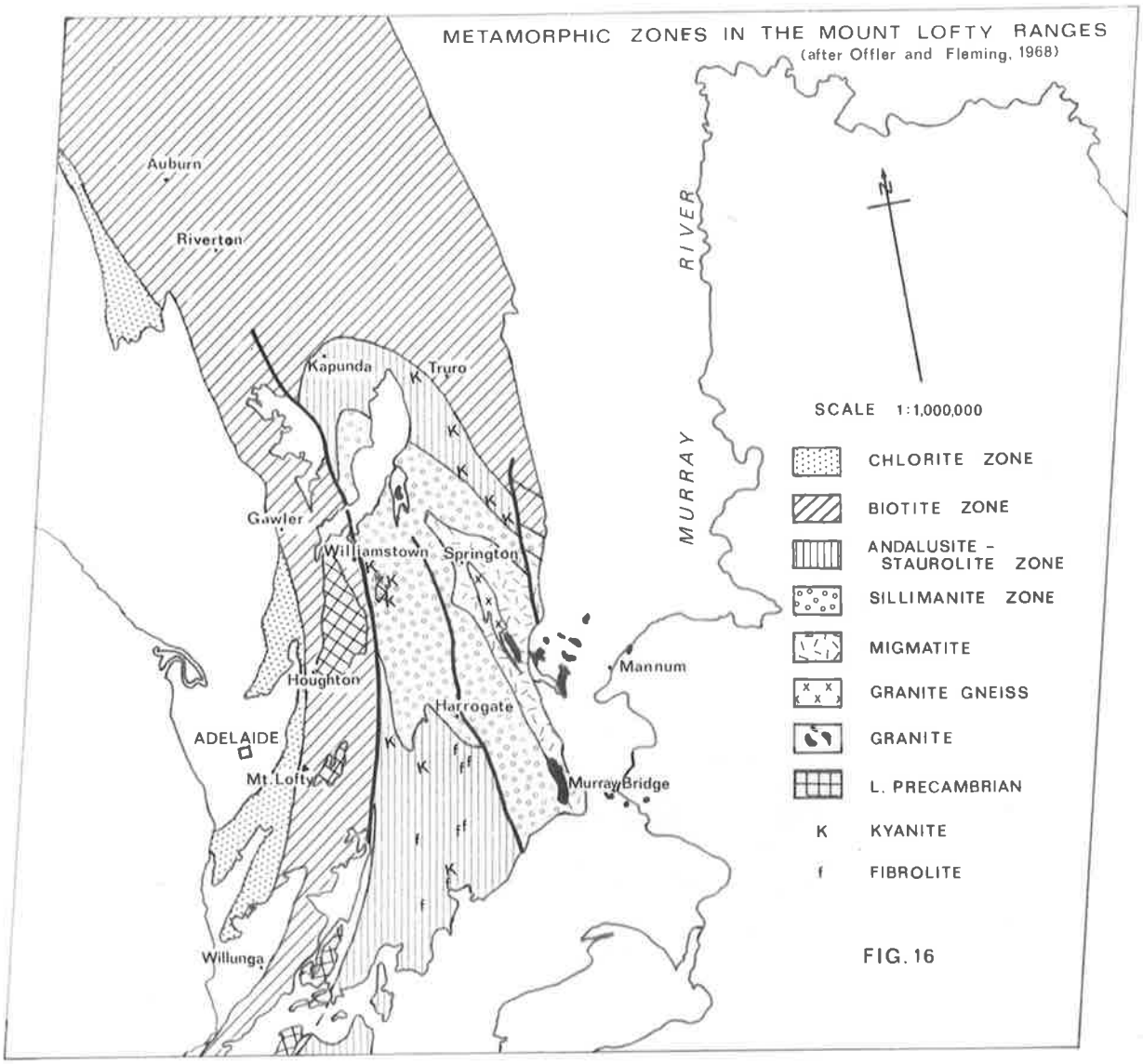
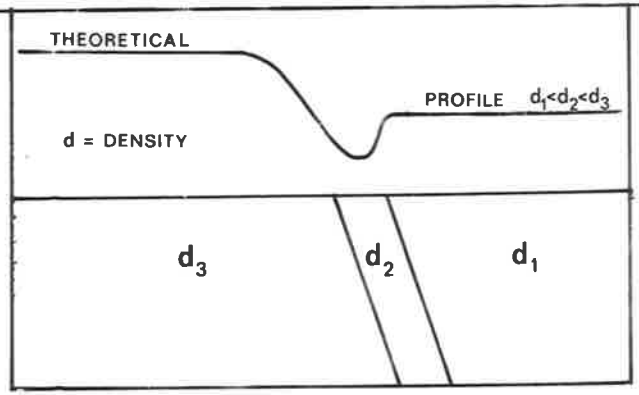
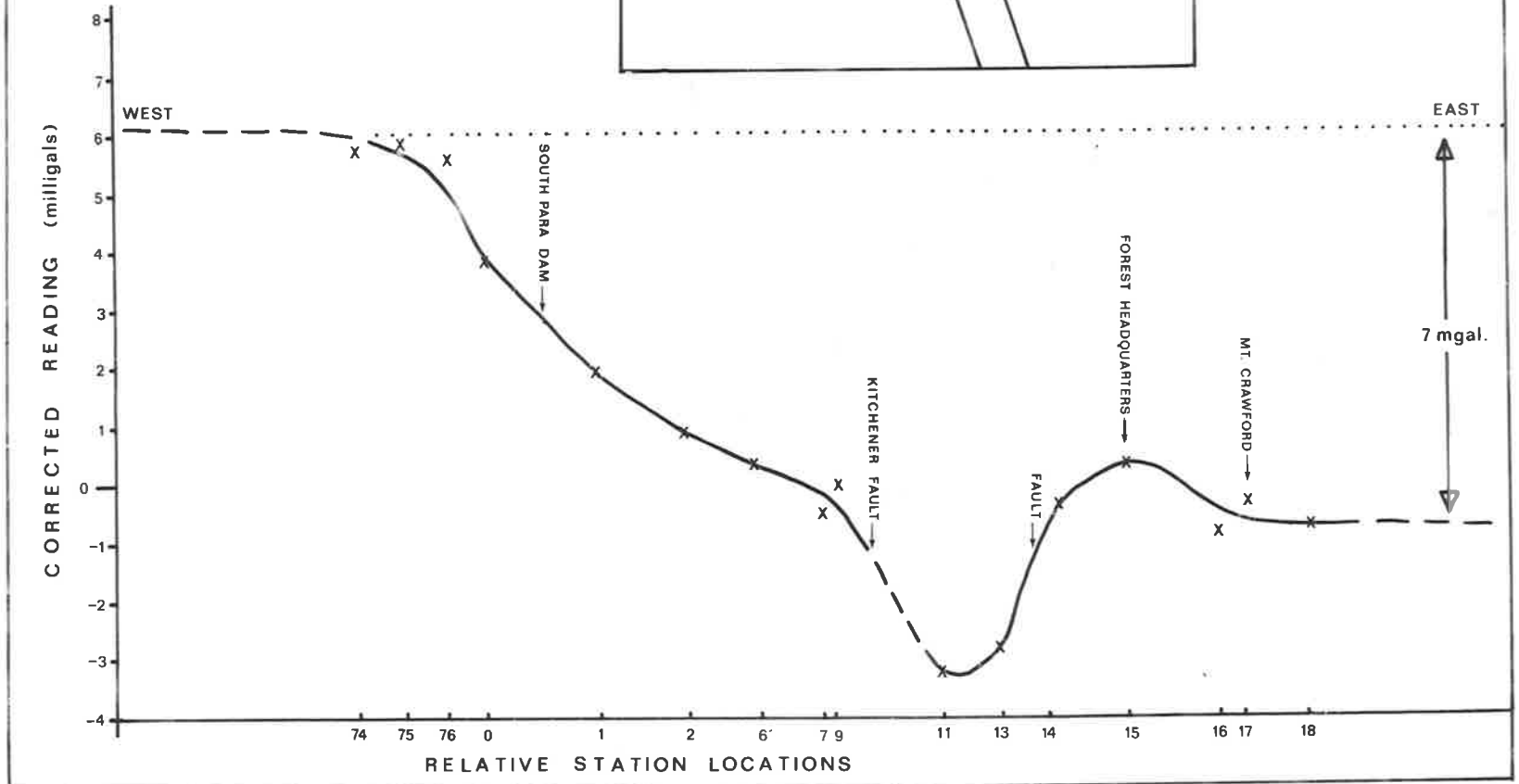

METAMORPHIC ZONES IN THE MOUNT LOFTY RANGES
(after Offler and Fleming, 1968)
Auburn
Riverton
Kapunda
Truro
Gawler
Williamstown
Springton
Houghton
Harrogate
Mannum
ADELAIDE
Mt. Lofty
Murray Bridge
Willunga
RIVER MURRAY
N
SCALE 1:1,000,000
CHLORITE ZONE
BIOTITE ZONE
ANDALUSITE - STAUROLITE ZONE
SILLIMANITE ZONE
MIGMATITE
GRANITE GNEISS
GRANITE
L. PRECAMBRIAN
K KYANITE
f FIBROLITE

FIG. 16

FIG. 17

GRAVITY PROFILE
THROUGH WILLIAMSTOWN





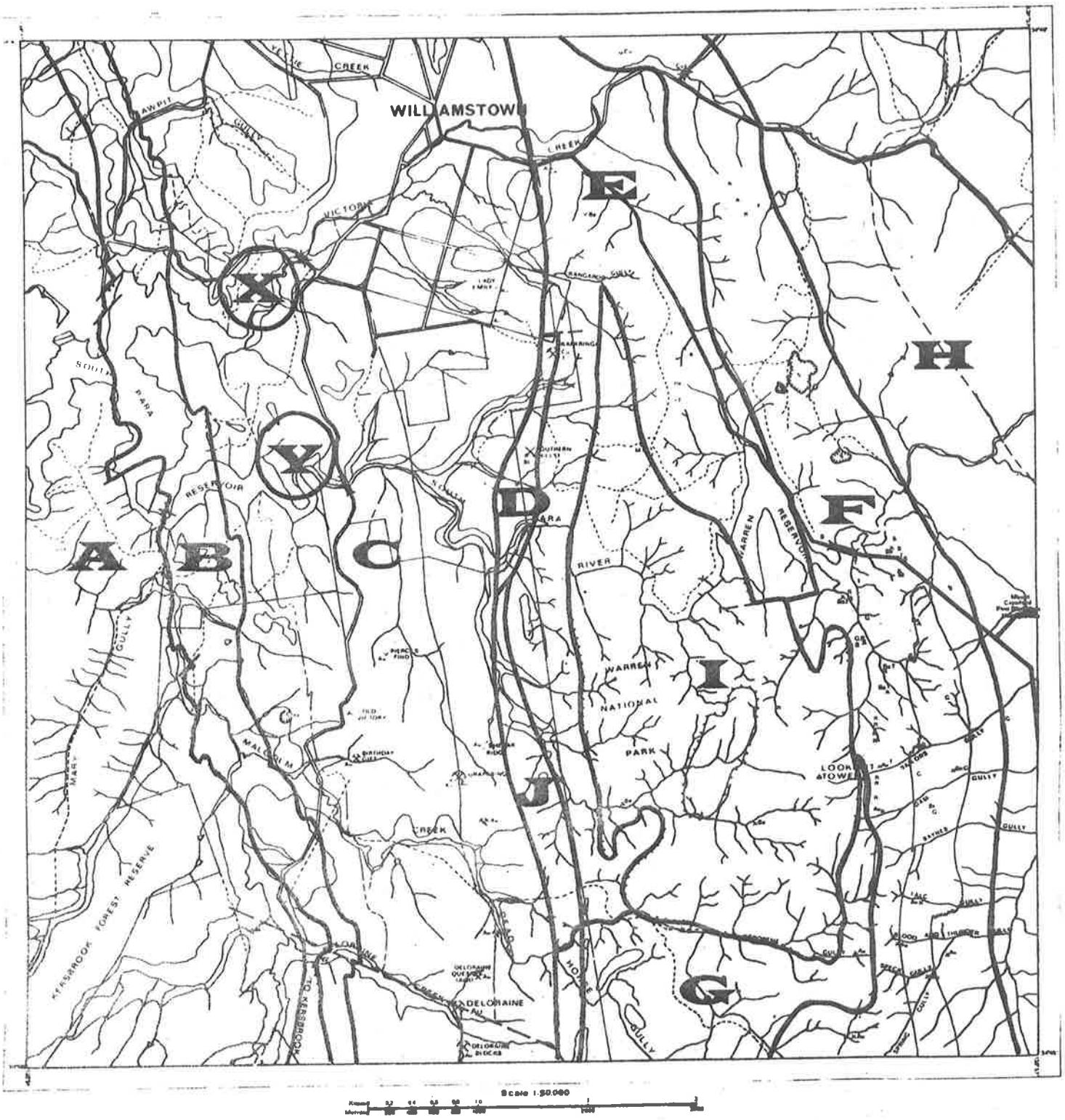


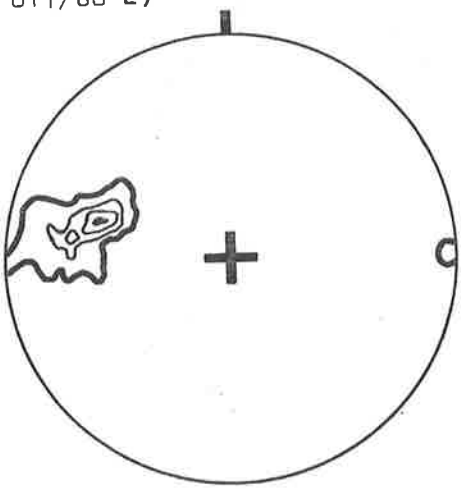
FIG.18

LOCATION OF SUB-AREAS

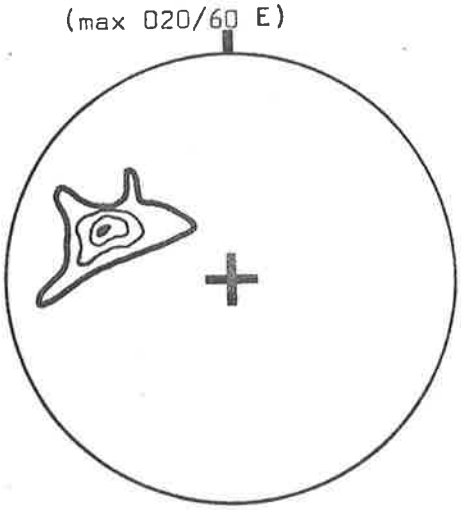
FIGURE 19

SUB-AREA A

94 SCHISTOSITIES
(max 017/60 E)

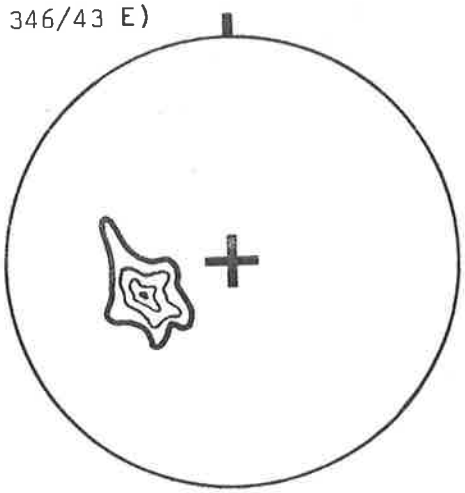


49So
(max 020/60 E)



SUB-AREA B

47So
(max 346/43 E)



BASAL SECTION
RHYNIE SANDSTONE (WEST)

20So
(max 084/42 S)

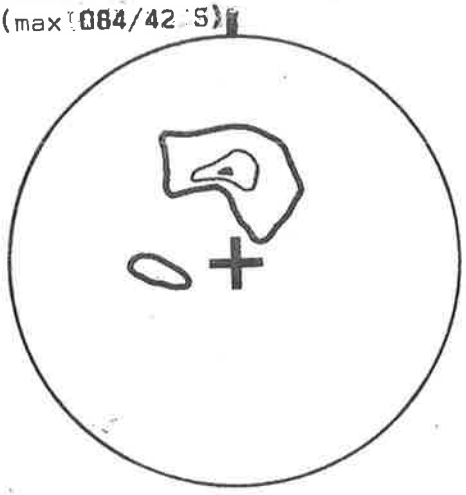
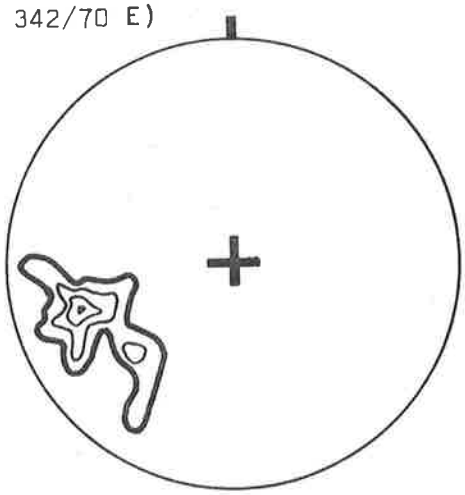


FIGURE 20

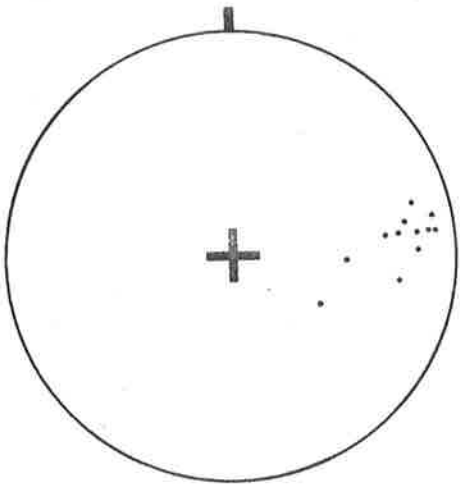
SUB-AREA C

55So
(max 342/70 E)



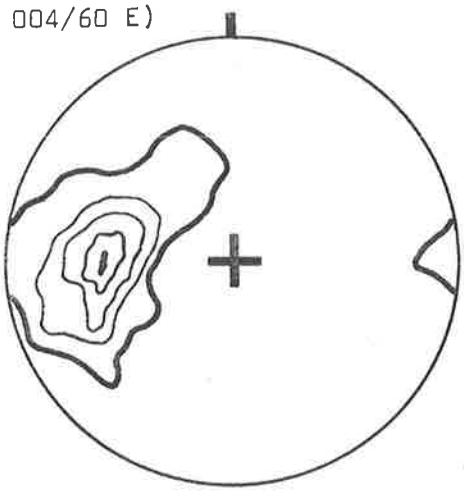
SUB-AREA D

12So



SUB-AREA D

86S_1
(max 004/60 E)



3S_2

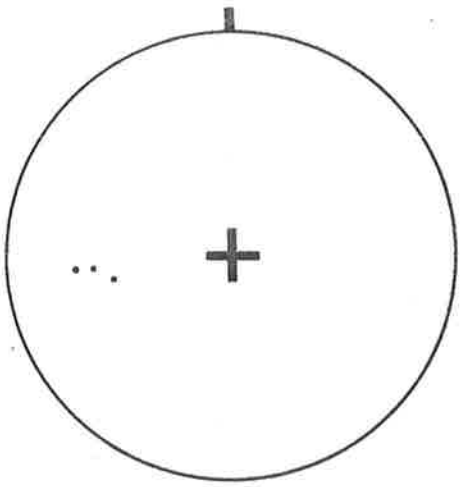
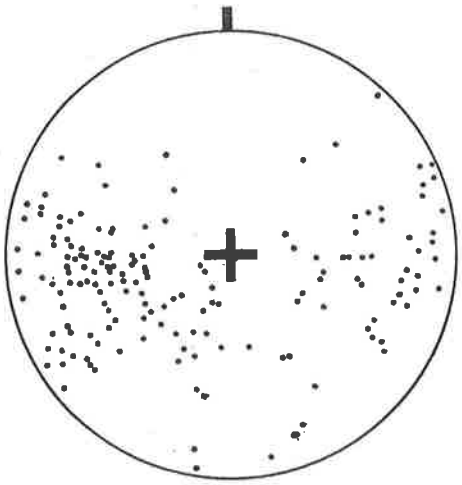


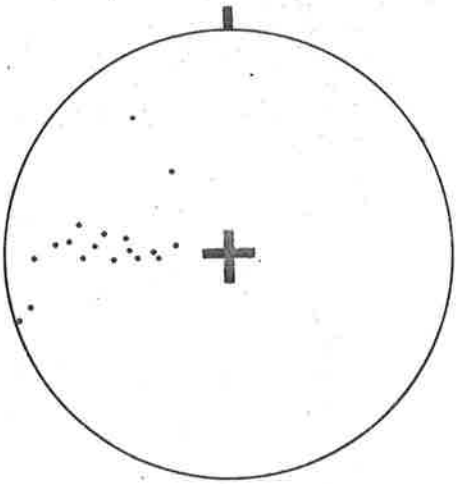
FIGURE 21

SUB-AREA E

1765o

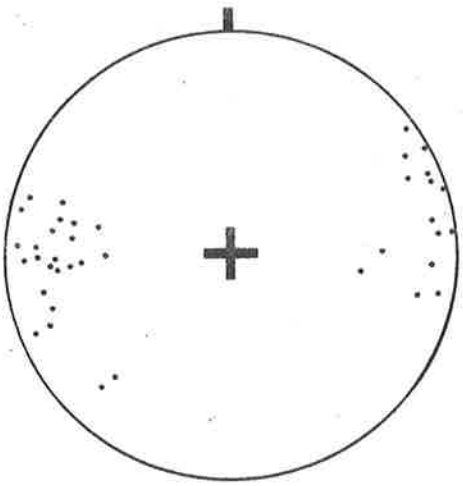


$18S_1$



SUB-AREA E

$40S_2$



$6S_3$

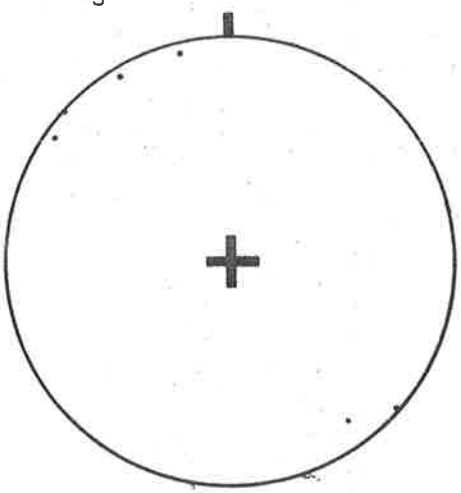
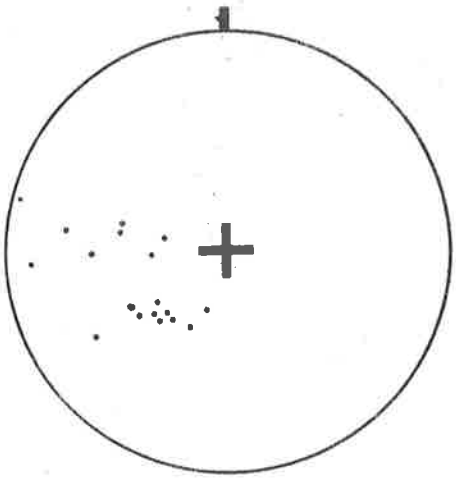


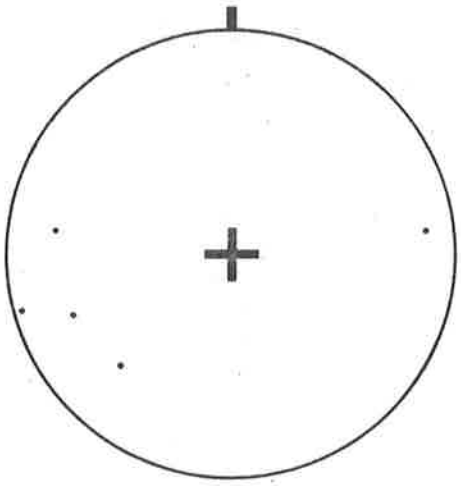
FIGURE 22

SUB-AREA F

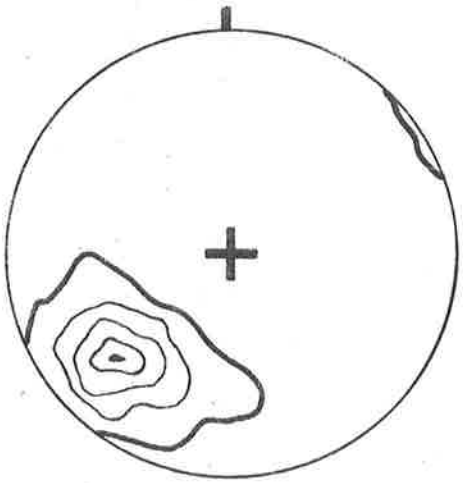
22 S_0



5 S_1



87 S_2
(max 074/72E)



47 S_3

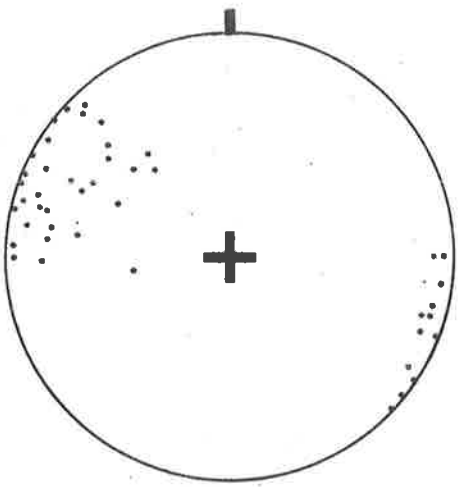
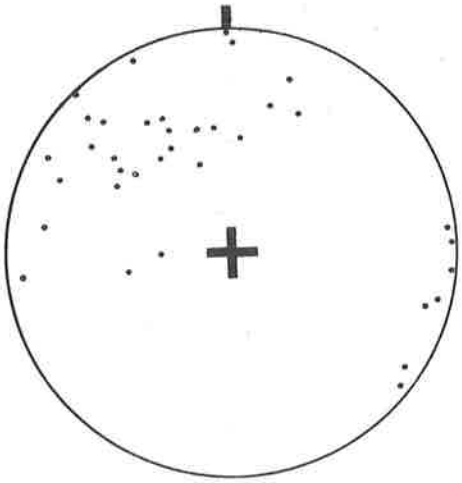


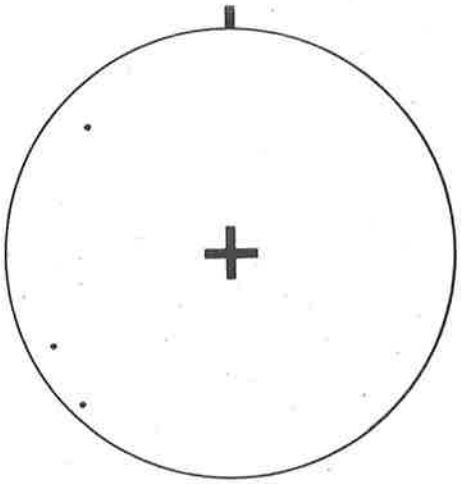
FIGURE 23

SUB-AREA G

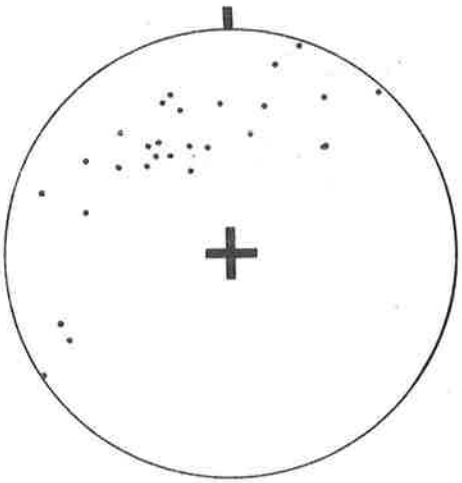
41 S_0



3 S_1



26 S_2



10 S_3

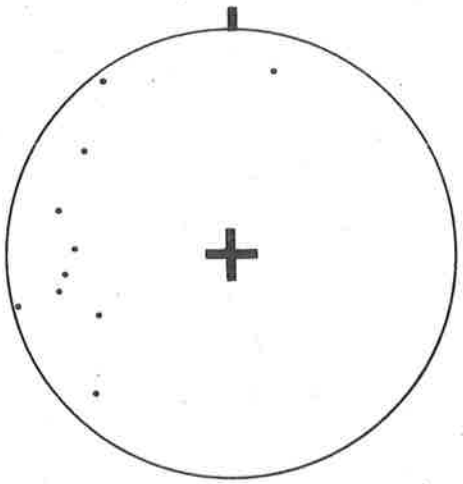
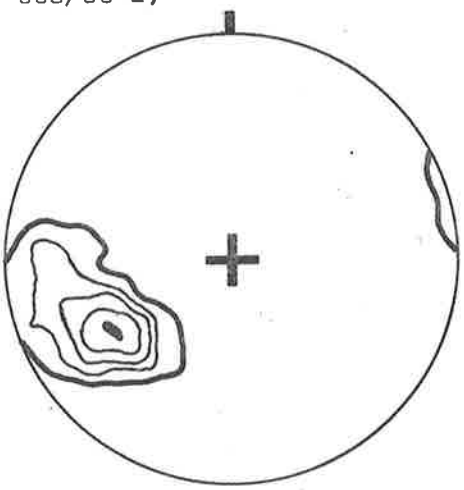


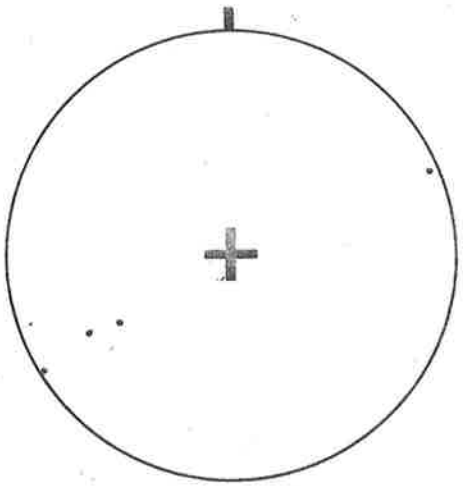
FIGURE 24

SUB-AREA H

84So
(max 330/68 E)

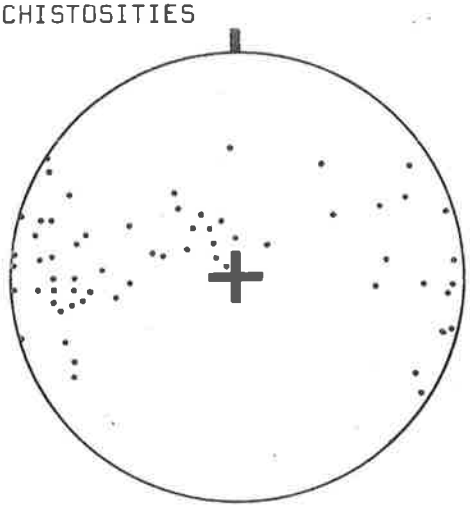


4S_1



SUB-AREA I

62 SCHISTOSITIES



SUB-AREA J

29So

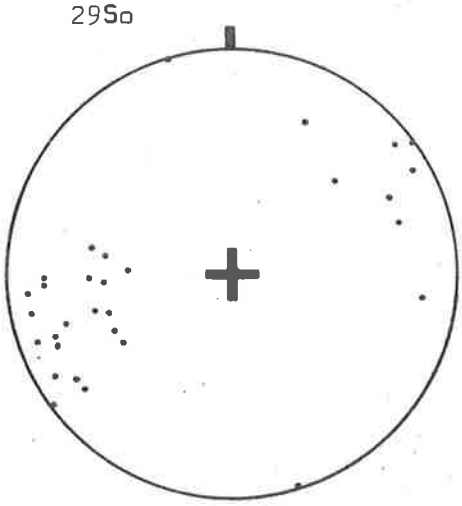
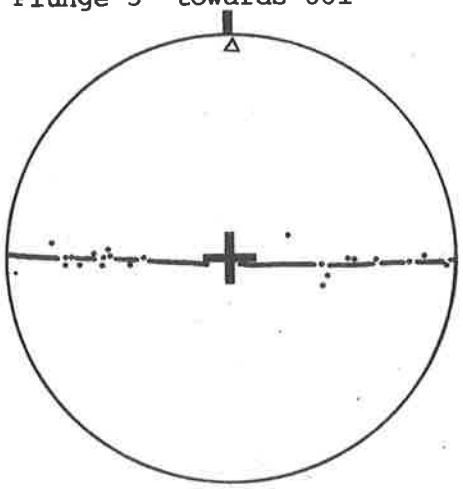


FIGURE 25

F_1 FOLDING IN RHYNIE SANDSTONE (SUB-AREA E)

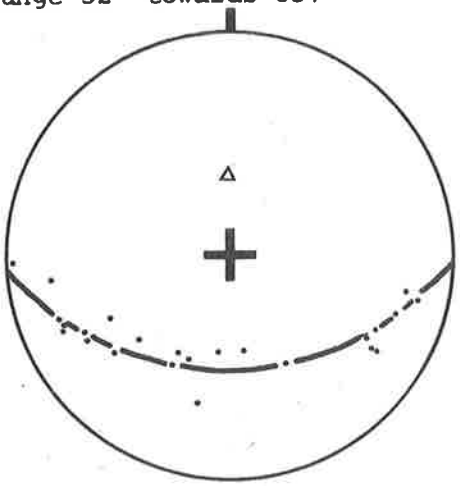
29 S_o

Plunge 3° towards 001°



27 S_o

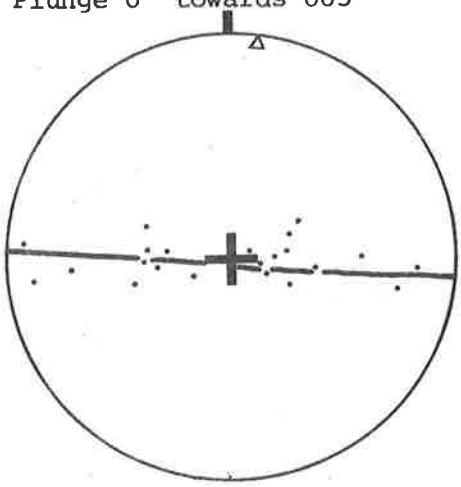
Plunge 52° towards 357°



F_1 FOLDING IN SADDLEWORTH FORMATION (DELORAINE MINE AREA)

22 S_0

Plunge 0^0 towards 005^0



17 S_0

Plunge 24° towards 028°

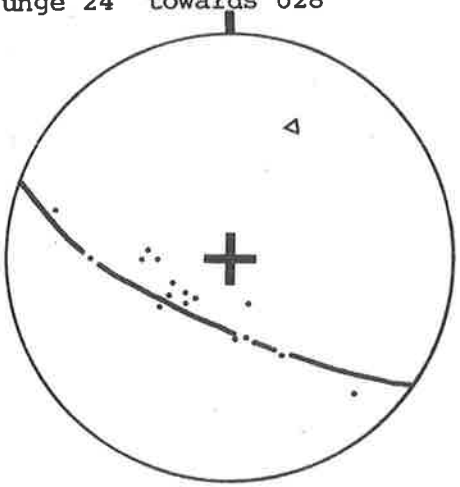
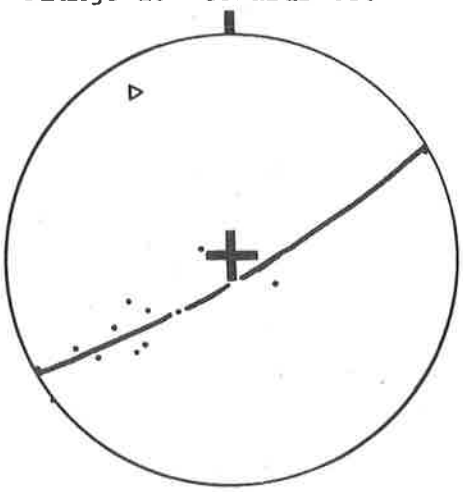


FIGURE 26

F_2 FOLDING IN SPRINGFIELD SUB-GROUP (AIM QUARRY AREA)

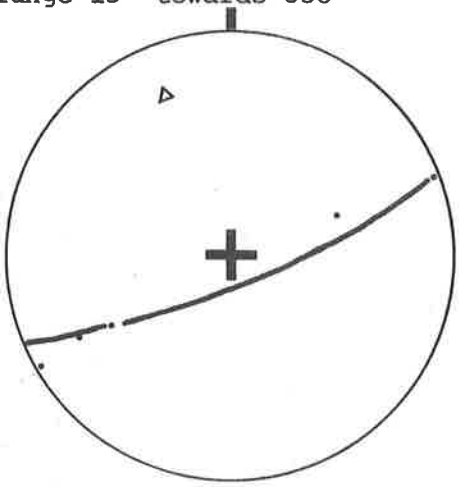
11 S_1

Plunge 10° towards 330°



5 S_1

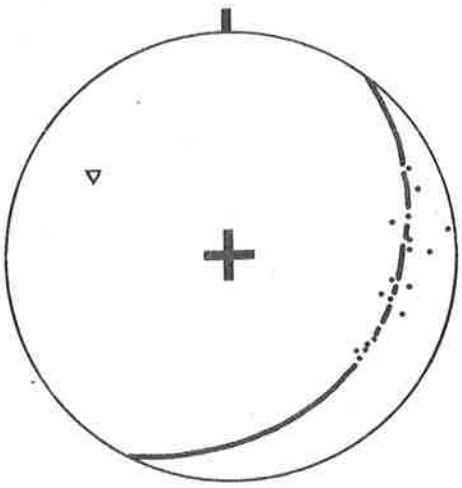
Plunge 15° towards 338°



F_2 FOLDING IN UKAPARINGA MINE

20 S_1

Plunge 70° towards 302°



JOINTS

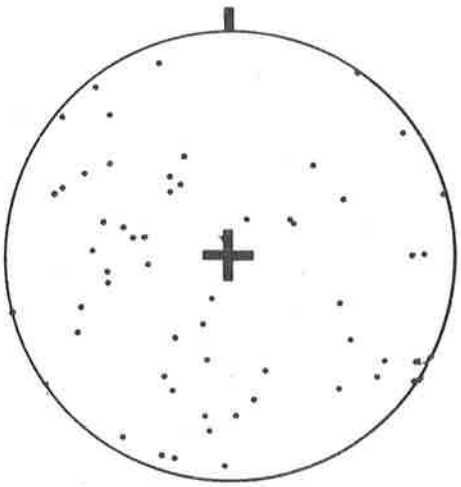
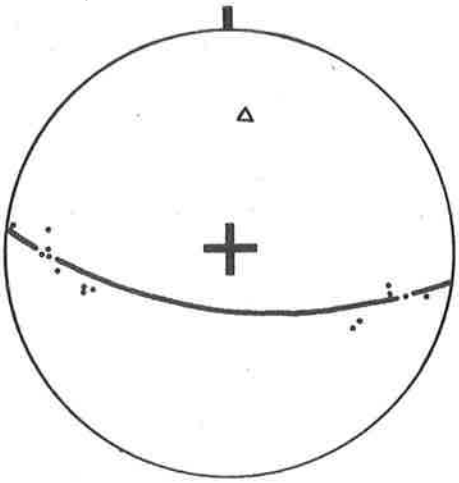


FIGURE 27

F_1 FOLDING IN WOOLSHED FLAT SHALE (SOUTH PARA DAM AREA)

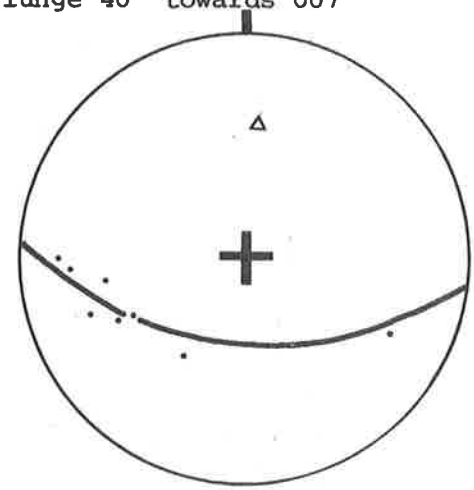
15 S_0

Plunge 30° towards 008°



8 S_0

Plunge 40° towards 007°

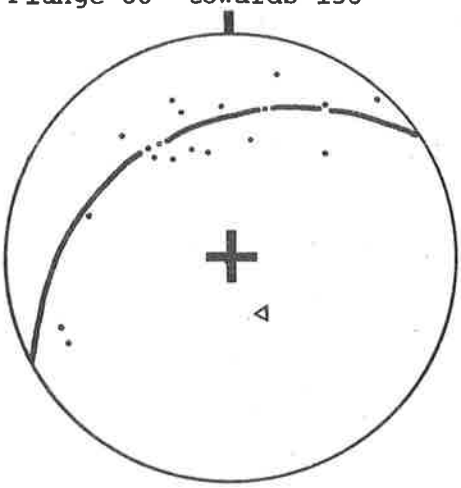


F_3 FOLDING

SUB-AREA G

23 S_2

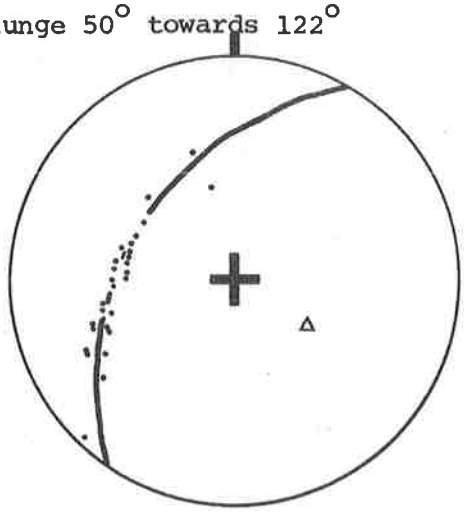
Plunge 60° towards 150°



UKAPARINGA MINE

28 S_2

Plunge 50° towards 122°



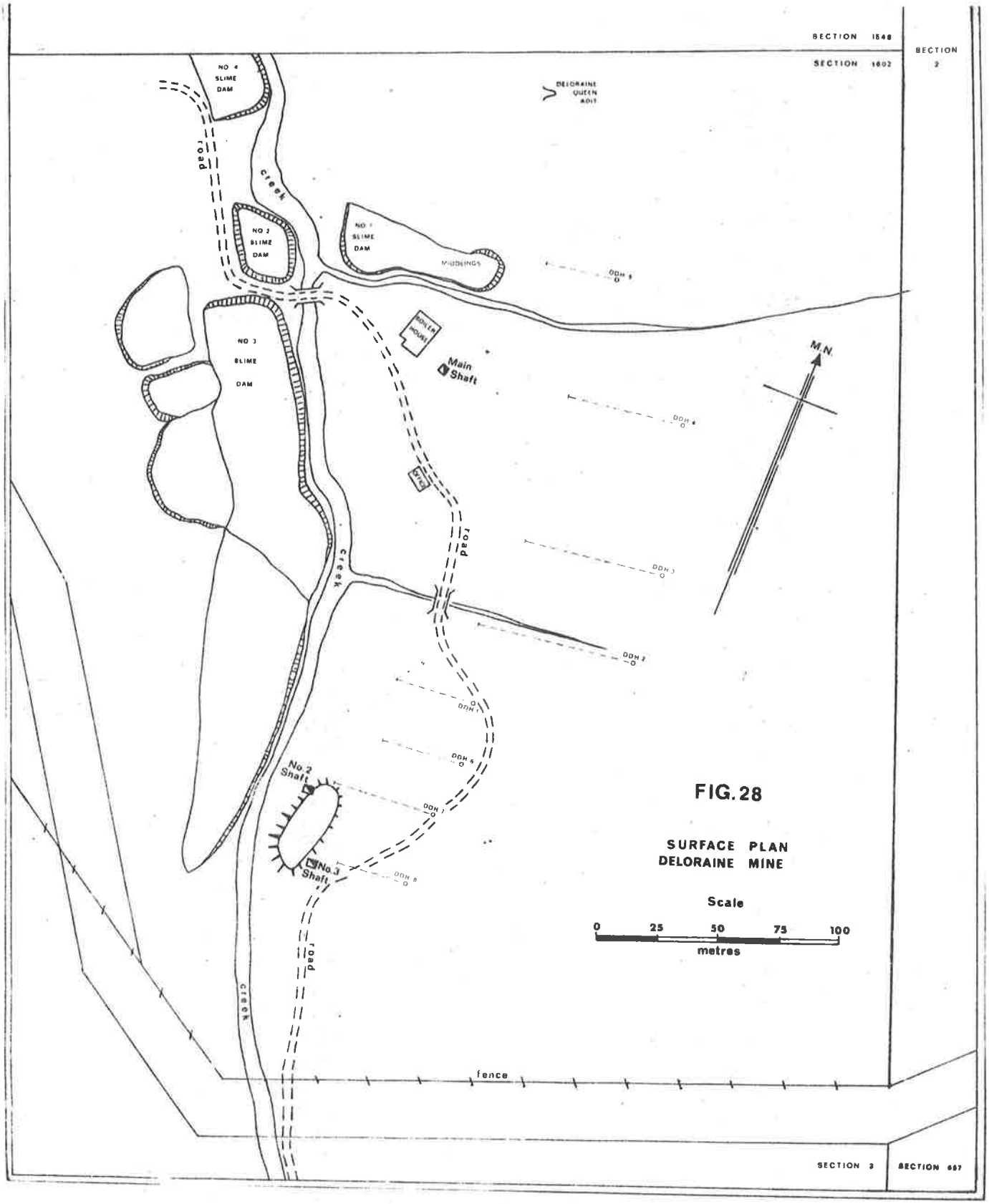


FIG. 28

SURFACE PLAN
DELORAINE MINE

Scale

0 25 50 75 100

metres

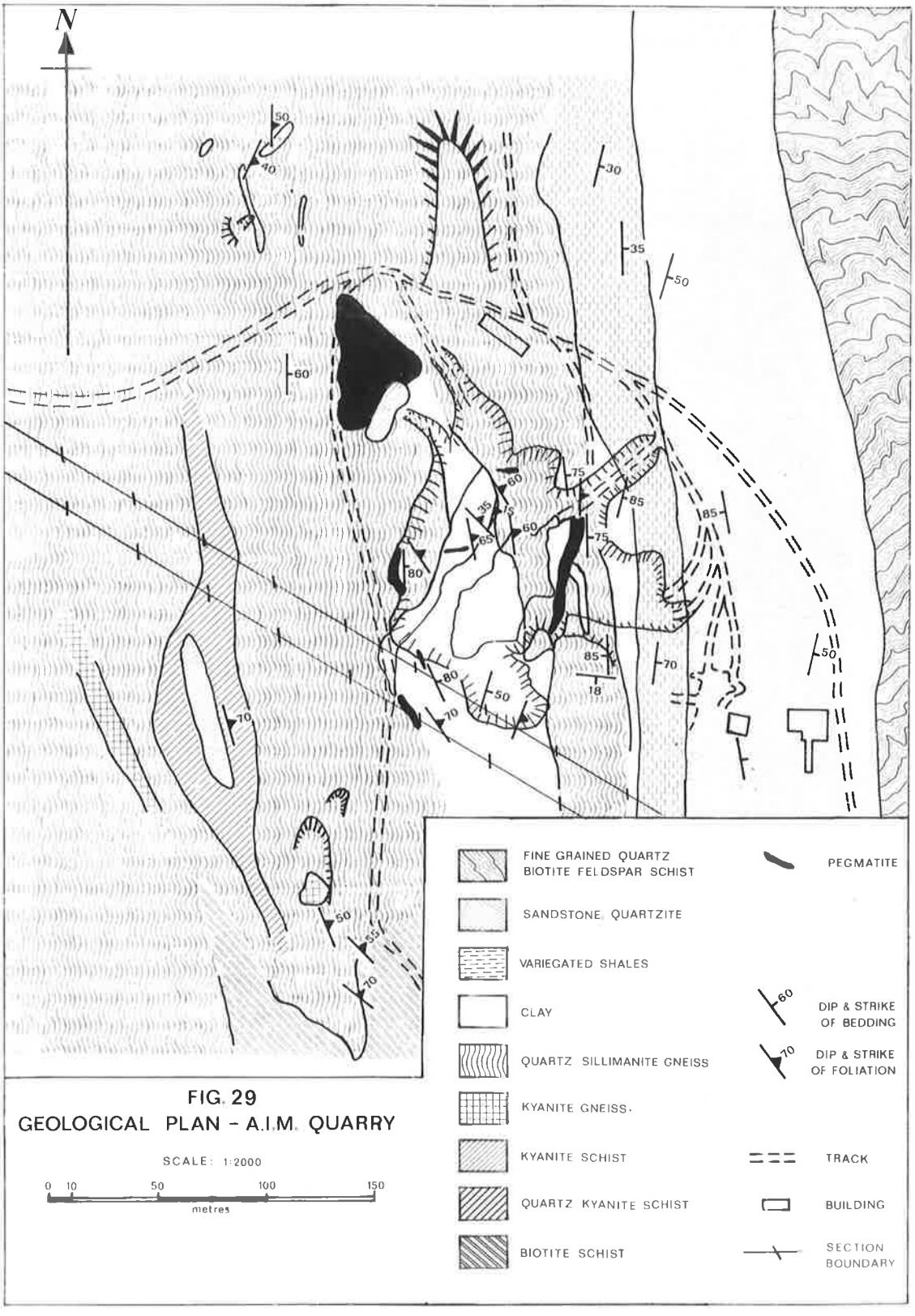


FIG. 29
GEOLOGICAL PLAN - A.I.M. QUARRY

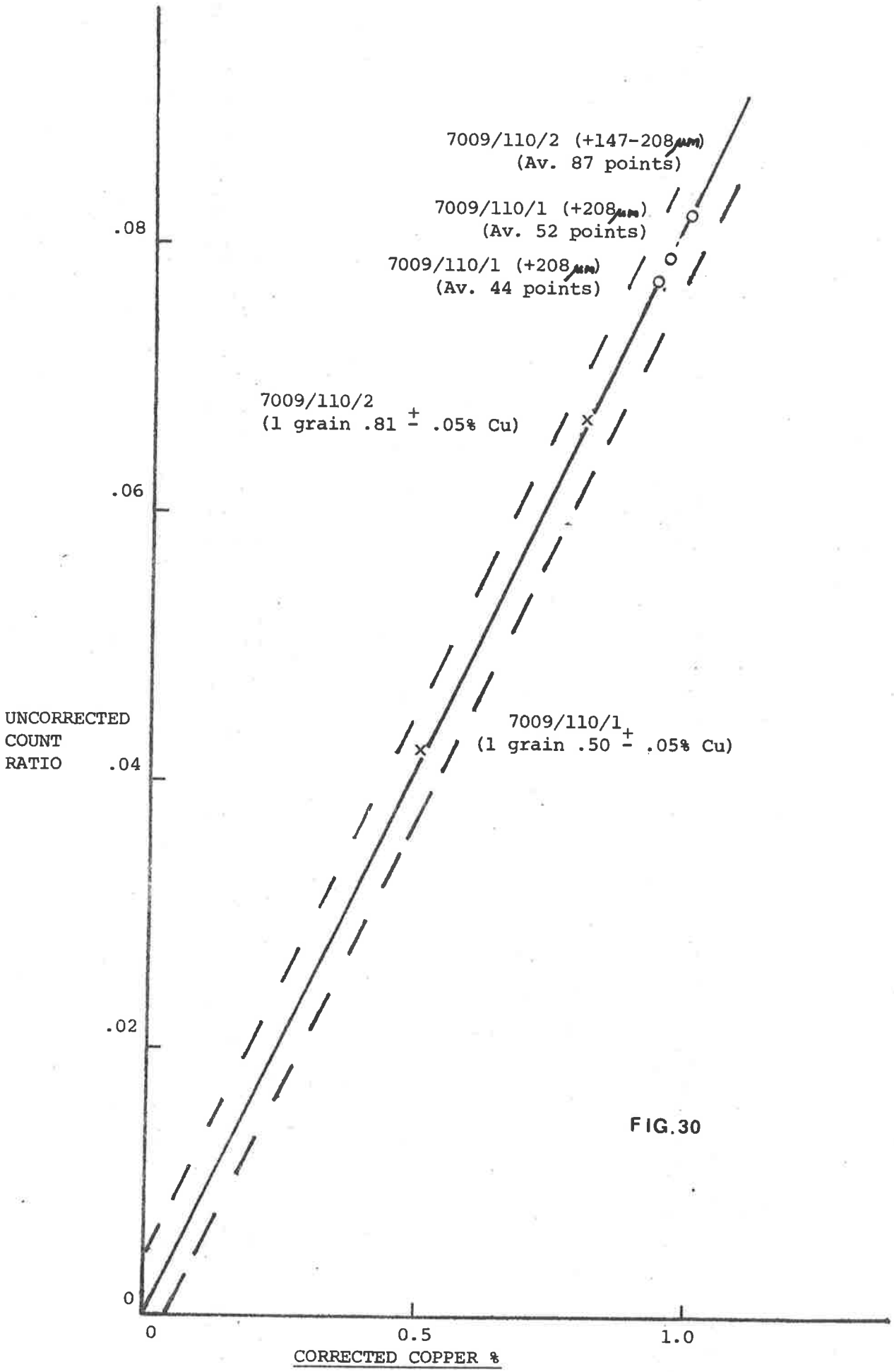

7009/110/2 (+147-208μm)
(Av. 87 points)
7009/110/1 (+208μm)
(Av. 52 points)
7009/110/1 (+208μm)
(Av. 44 points)
7009/110/2
(1 grain .81 ± .05% Cu)
7009/110/1
(1 grain .50 ± .05% Cu)
UNCORRECTED
COUNT
RATIO
.08
.06
.04
.02
0
0
0.5
1.0
CORRECTED COPPER %

FIG.30

PLATE I.

Looking south-east from the Ukaparinga Mine across the Williamstown-Kersbrook Valley towards the Kersbrook Forest Reserve

PLATE II.

Typical profile of the Barossa (Hilly) Soil Association

PLATE III.
Open sclerophyll forest typically developed over soils of the Barossa (Hilly) Association. Photo shows stringybark trees and yacca shrubs.

PLATE IV.
Peppermint gums (Eucalyptus odorata), the predominant native tree in the Burra (Eastern) Doil Association

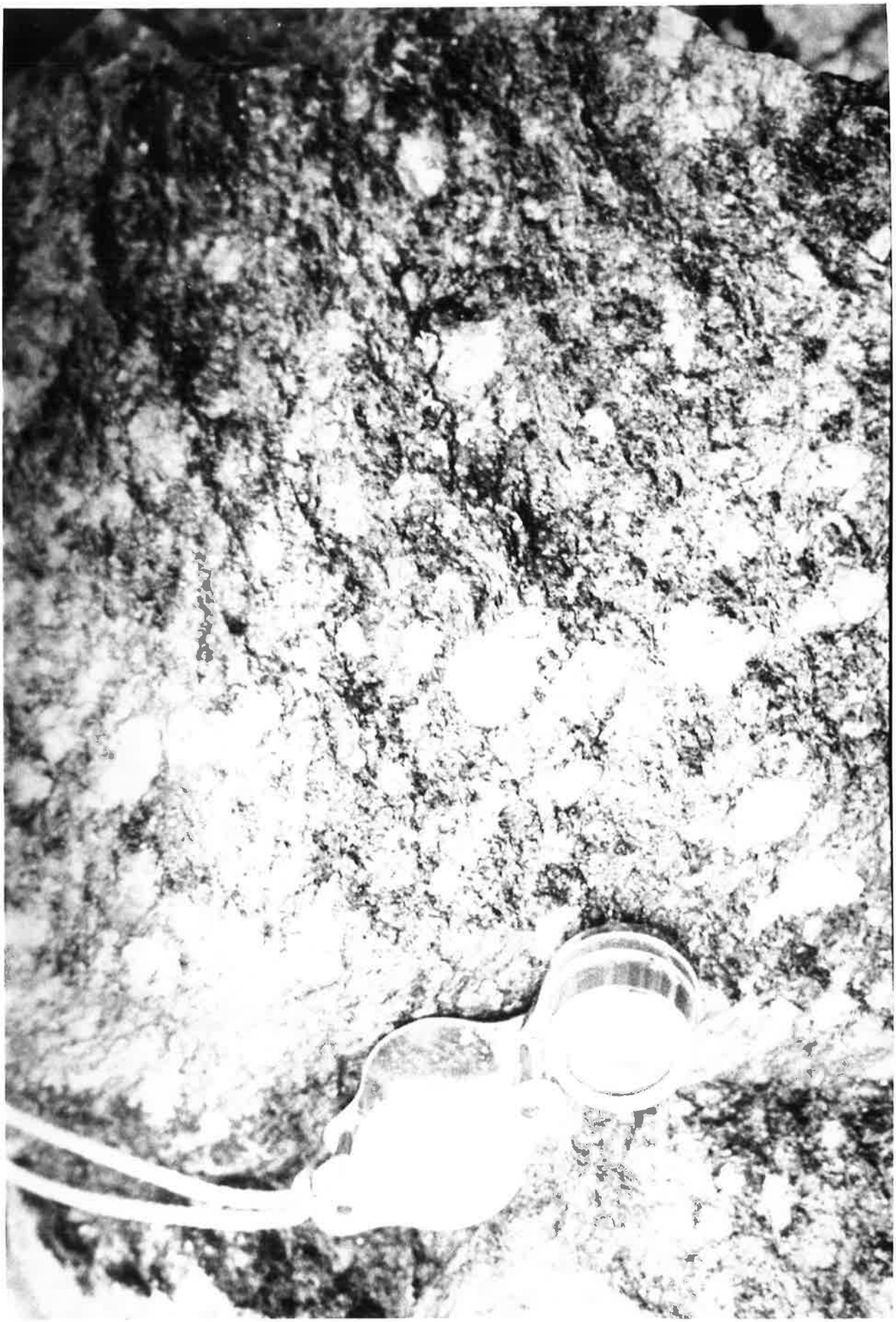


PLATE V.

Hand specimen of augen gneiss, showing the distinctive quartz and feldspar "augen" disposed along the foliation.

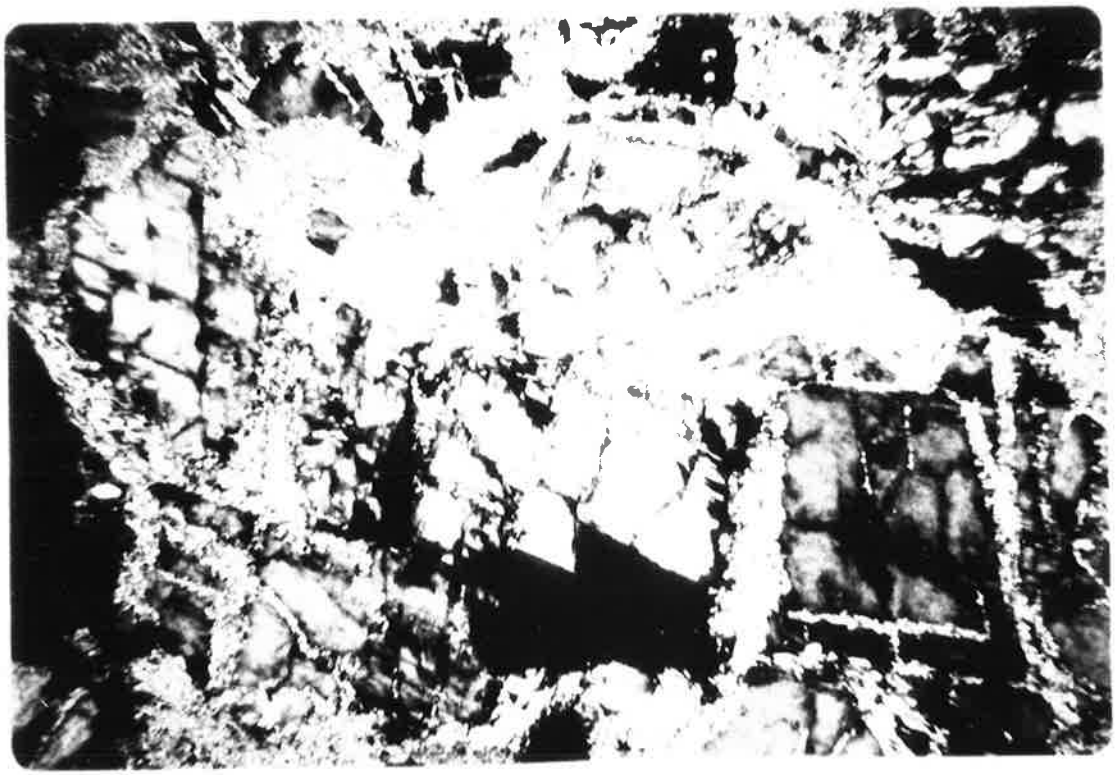


PLATE VI.

T.S. 4660 - augen gneiss. Highly fractured grain of microcline, with fine sericite occupying fractures and forming an alteration rim around the microcline augen.

Scale (both photos)

PLATE VII.

TS 4662 - augen gneiss. Quartz "porphyroblast" remaining substantially intact after sericitization of other minerals in the specimen,

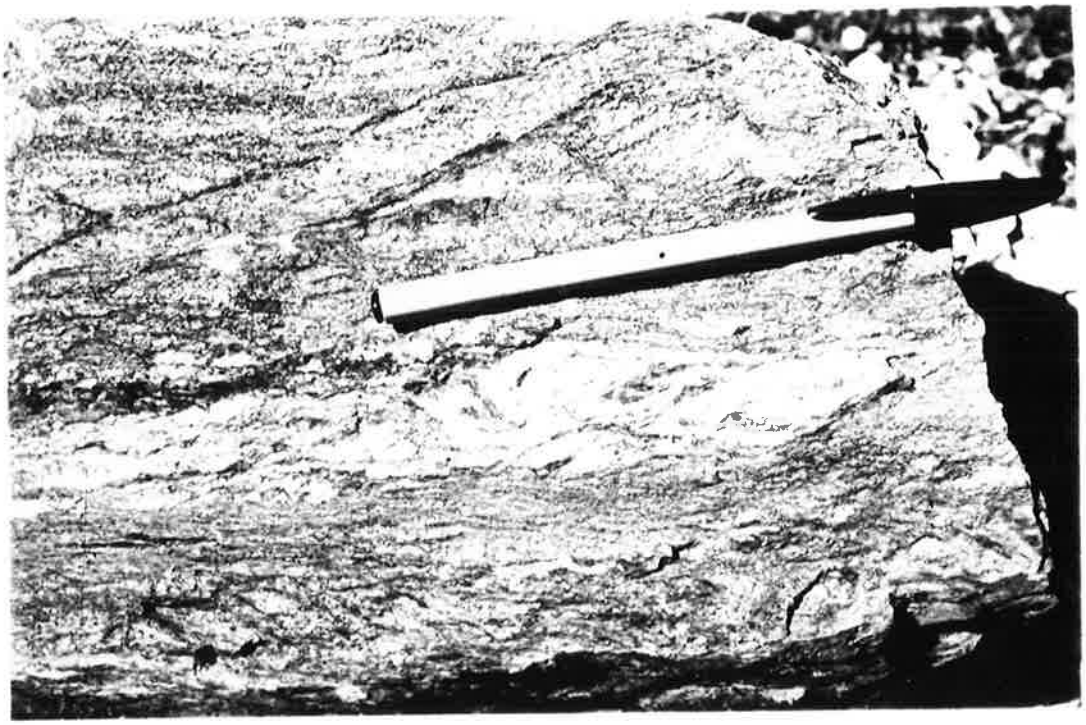


PLATE VIII.

Phyllonite showing regular foliation planes. Locality: tunnel connecting South Para Weir and Barossa Reservoir.

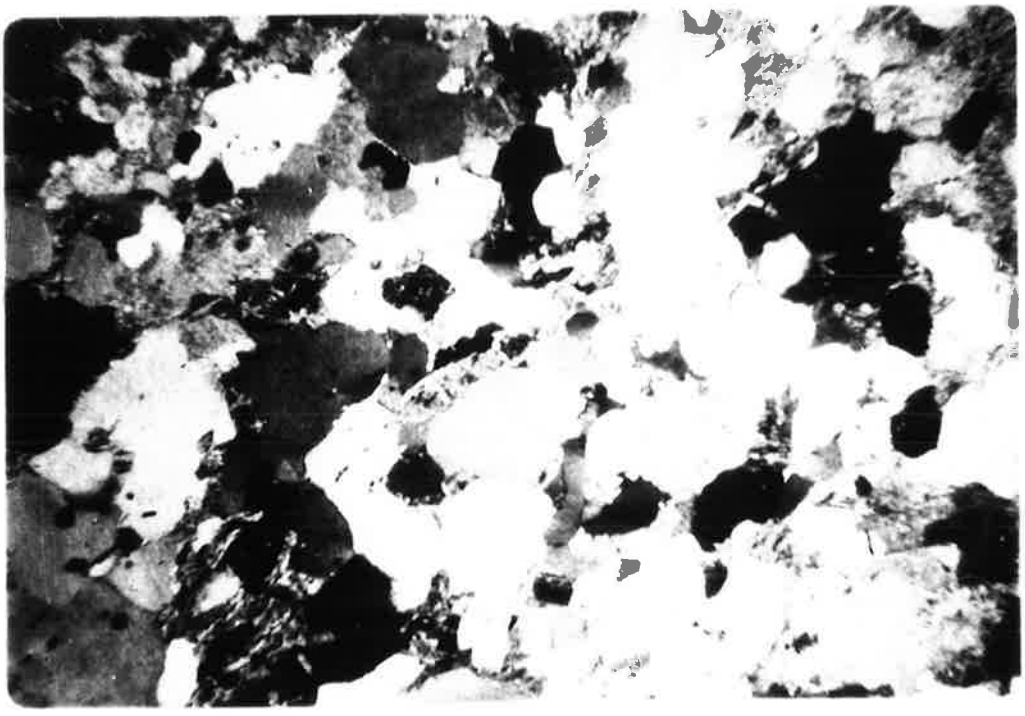


PLATE IX.

TS 4663 - phyllonite. Mosaic of interlocking quartz, biotite and feldspar grains.

0 0.5 1.0cm.

Scale

PLATE X.

Basal conglomerate developed in Rhynie Sandstone at contact with underlying Barossa Complex. Locality: bank, of South Para Reservoir near spillway (water level very low).

PLATE XI.

Spectacular unconformity surface exhibited on bank of South Para Reservoir when water level is extremely low. Note the very irregular surface, and potholing.

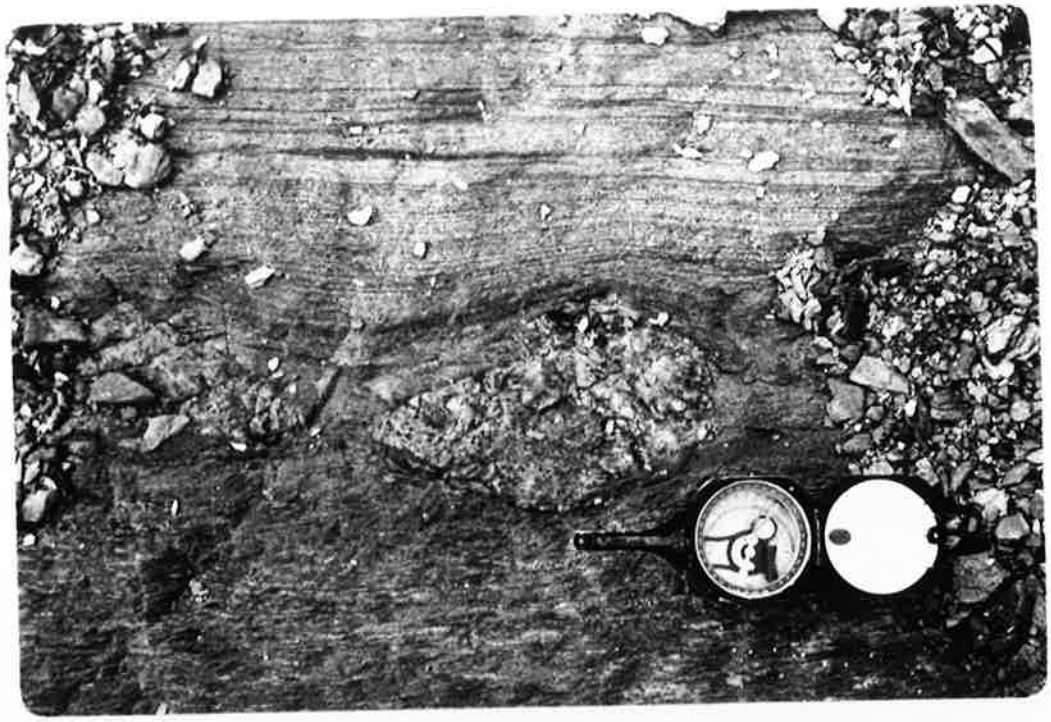


PLATE XII.
Relatively smooth unconformity surface seen in Malcolm Creek on banks of South Para Reservoir at very low water level.

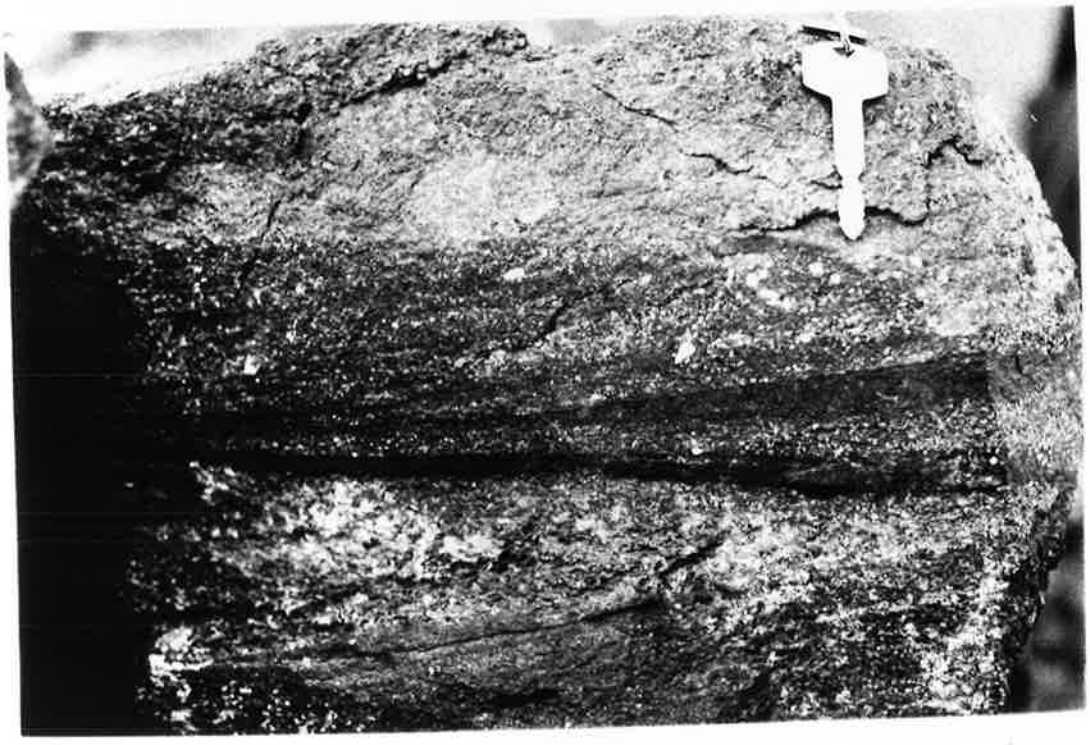


PLATE XIII.
Hematite grit in Rhynie Sandstone near Mt. Bessemer Mine.

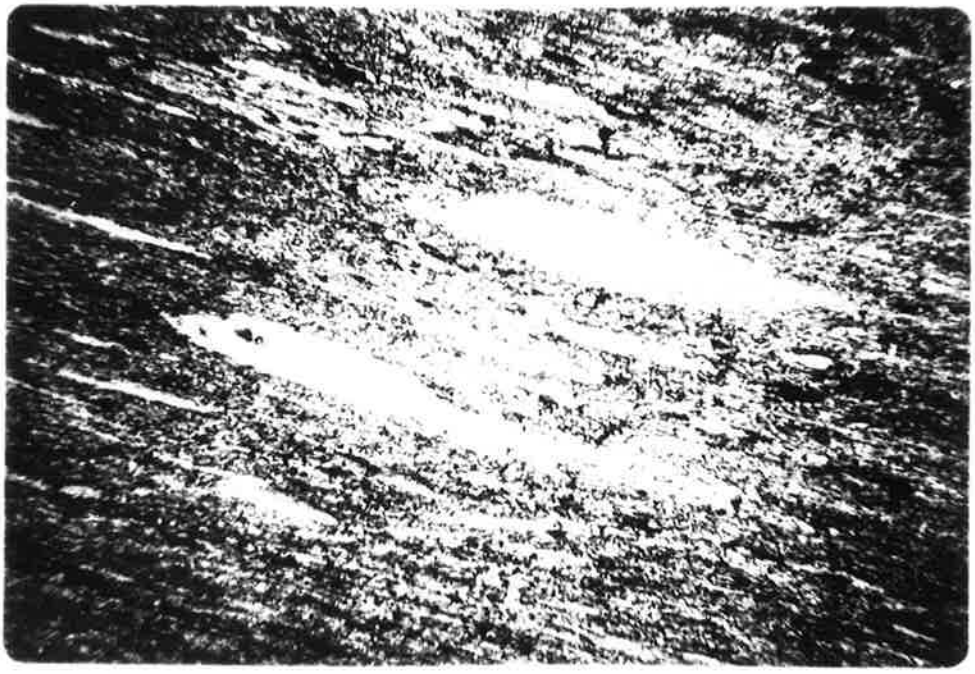


PLATE XIV.

TS 4665 - sericitic shale lens in Rhynie Sandstone . Note alignment of coarser-grained lenses of sericite within fine-grained matrix.

0 0.5 1.0 cm.

Scale

PLATE XV.

Phyllite beds within the Skillogalee Dolomite. Locality: north bank of South Para Reservoir downstream from bridge.

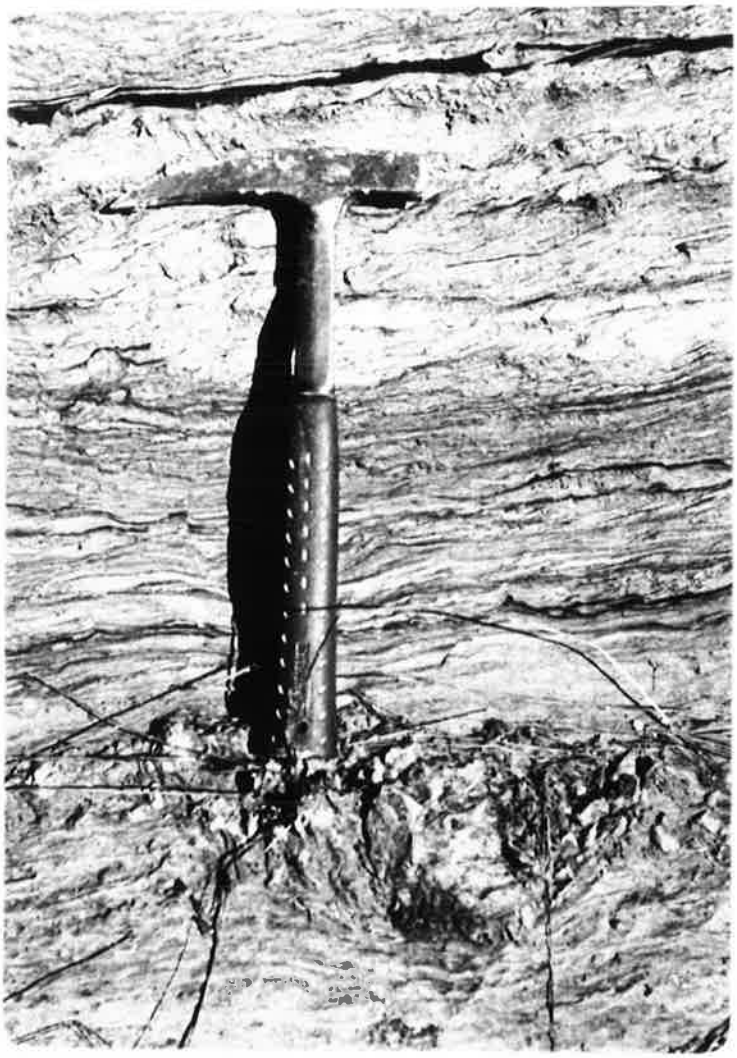


PLATE XVI.

Nodules and bands of chert in massive blue-grey dolomite bed within the Skillogalee Dolomite. Locality: Victoria Creek section of South Para Reservoir.

PLATE XVII.

Contact between Skillogalee Dolomite and overlying Undalya Quartzite exposed on north bank of South Para Reservoir, Victoira Creek section.

PLATE XVIII.

Non-marine grits, sands and gravels forming the Tertiary beds. Locality: excavation along the road north-west from South Para Dam.

PLATE XIX.

Flat surface of the old Tertiary peneplain perched on Barossa Complex rocks north-west from South Para Dam.

PLATE XX.

Ptygmatic folding in Warren Schist. Locality: track along pipeline above South Para Gorge, downstream from Warren Dam.

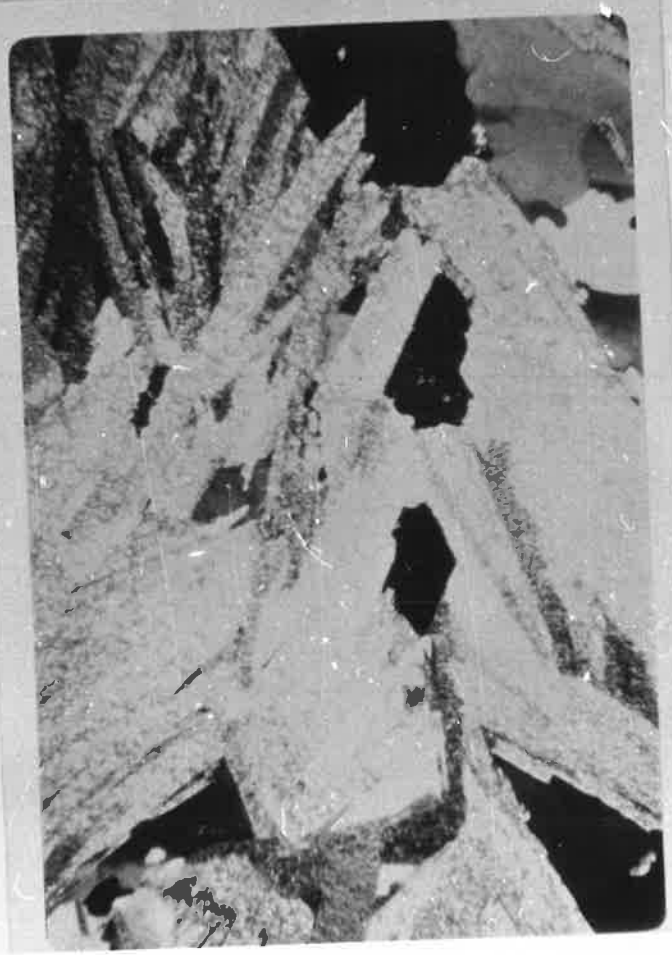


PLATE XXI.

TS 4516 - Warren Schist. Crenulated coarse muscovite-biotite schist. Note the fresh appearance of the mica flakes

0 0.5 1.0 cm.

Scale

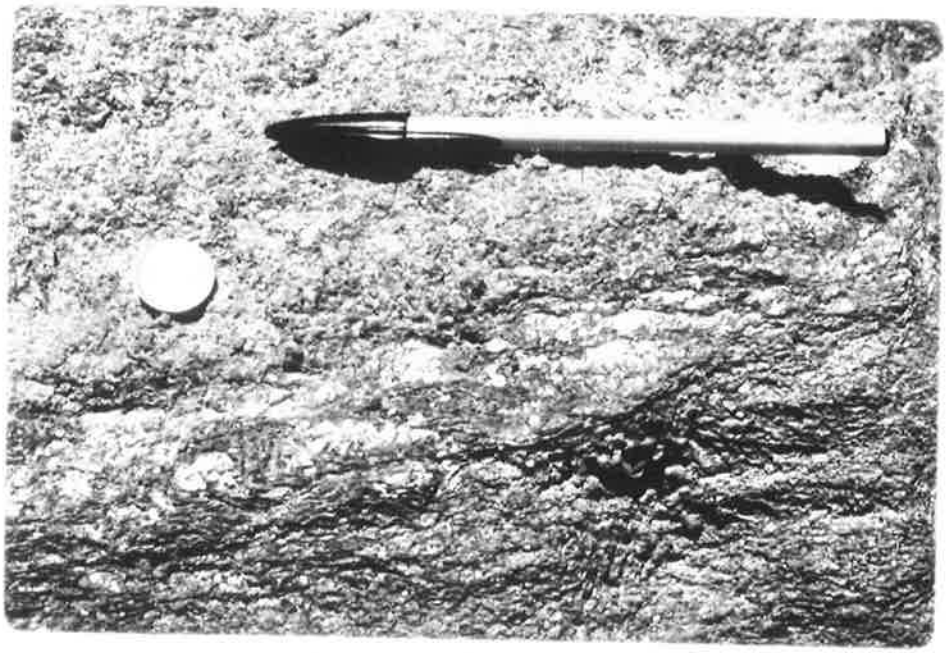


PLATE XXII.

Unconformity surface between Warren Schist and Rhynie Sandstone equivalent. Locality: pipeline track east of Southern Hills Prospect.

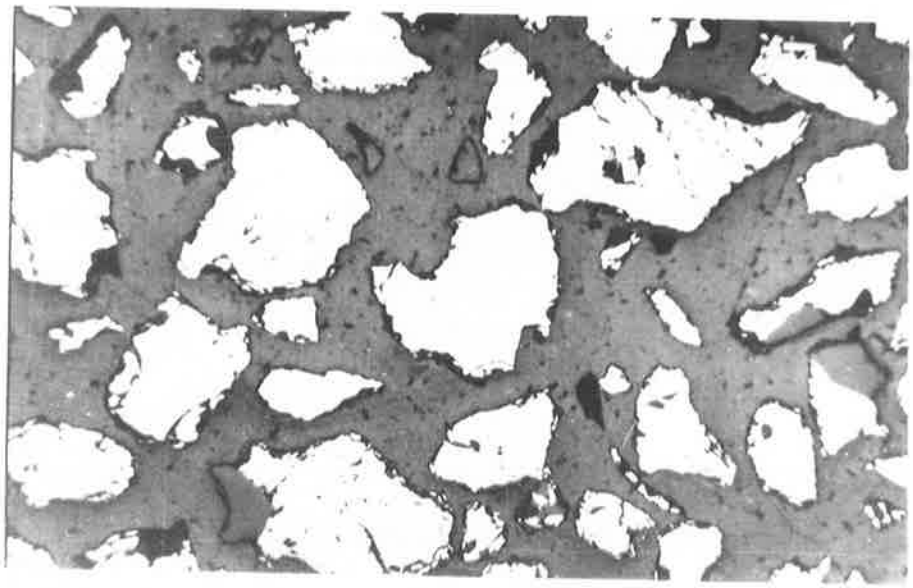


PLATE XXIII.

PS 4426 – heavy mineral concentrate from Rhynie Sandstone equivalent. Grains are relatively pure hematite with common lamellar twinning; ilmenite is exsolved along lamellae.

0 2 5 mm.

Scale

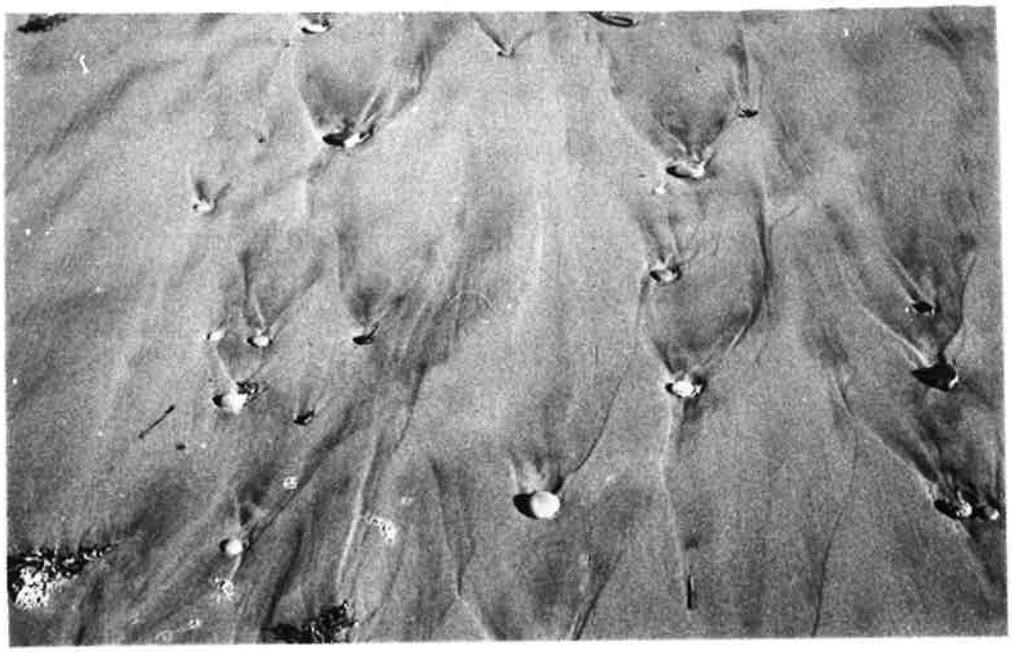


PLATE XXIV.
Pebbles within well-sorted beach sands at Maslins Bay, S.A.

PLATE XXV.
Basal beds of the Springfield Sub-Group, near the bridge over the Warren Reservoir.

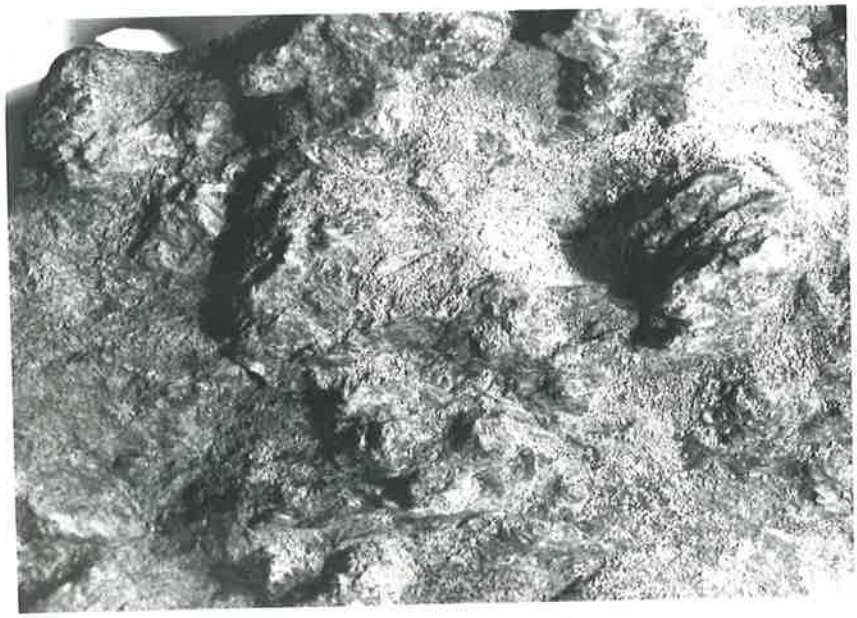


PLATE XXVI.

Knots of kyanite developed in kyanite-damourite schist within the Springfield Sub-Group northwest from Springfield Homestead.

0 2.5 5.0 cm.

Scale

PLATE XXVII,

Sheared and overturned contact between the Rhynie Sandstone equivalent and the Ukaparinga Schist, as seen in the adit in the Ukaparinga Mine.

0 0.5 1 metre

Scale

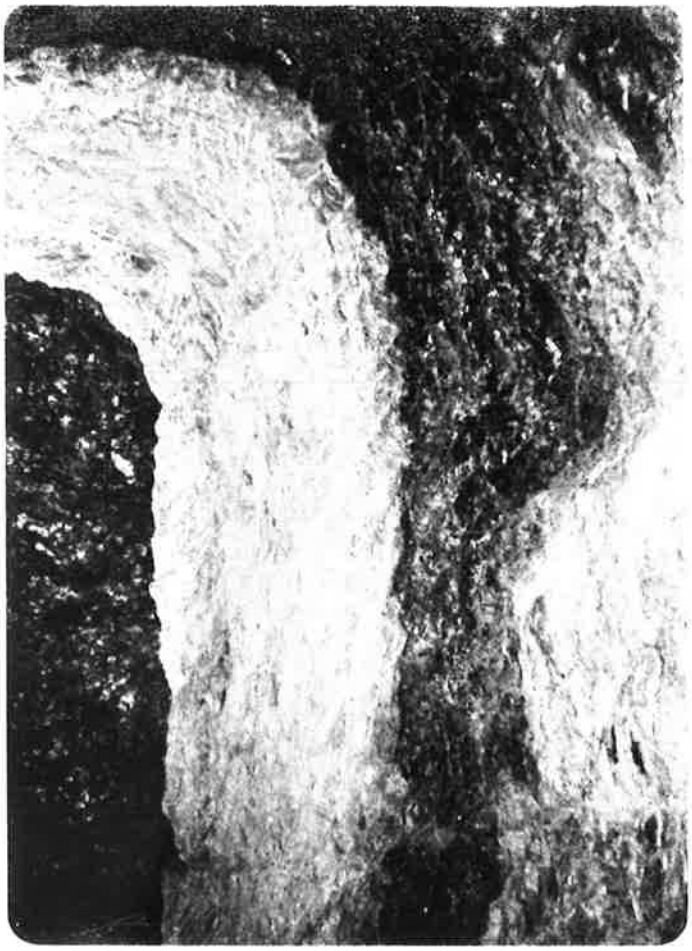


PLATE XXVIII.
One-metre band of white to silvery-grey quartz-sericite schist in black Ukaparinga Schist, exposed in mine adit.

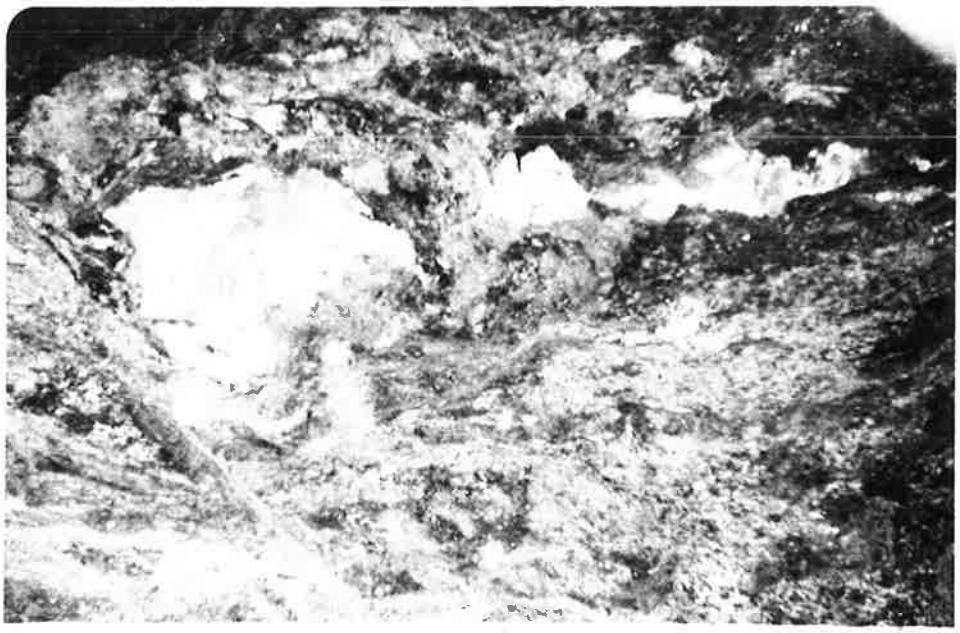


PLATE XXIX.
Lenses of vein quartz in Ukaparinga Schist, exposed in mine.

0 25 50 cm.
Scale

PLATE XXX.

Contact between Ukaparinga Schist (left) and Victoria Creek Marble exposed in the Ukaparinga Mine adit.

0 1.0 metre

Scale

PLATE XXXI.

Massive, sugary-textured Victoria Creek Marble exposed in an excavation for a drill site on the Southern Hills Prospect.

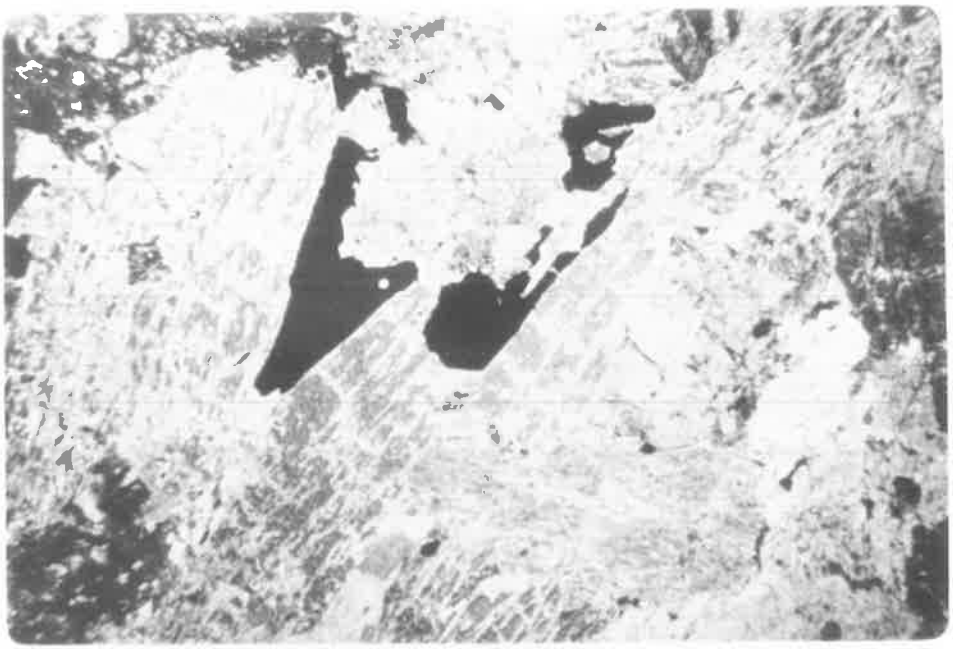


PLATE XXXII.

TS 4316 - Victoria Creek Marble. Intergrown tremolite and carbonate, the latter apparently replacing quartz. Talcose clay masses develop from alteration of carbonate (slide from Southern Hills DDH 5, 140.5 metres depth).

Scale (both photos)

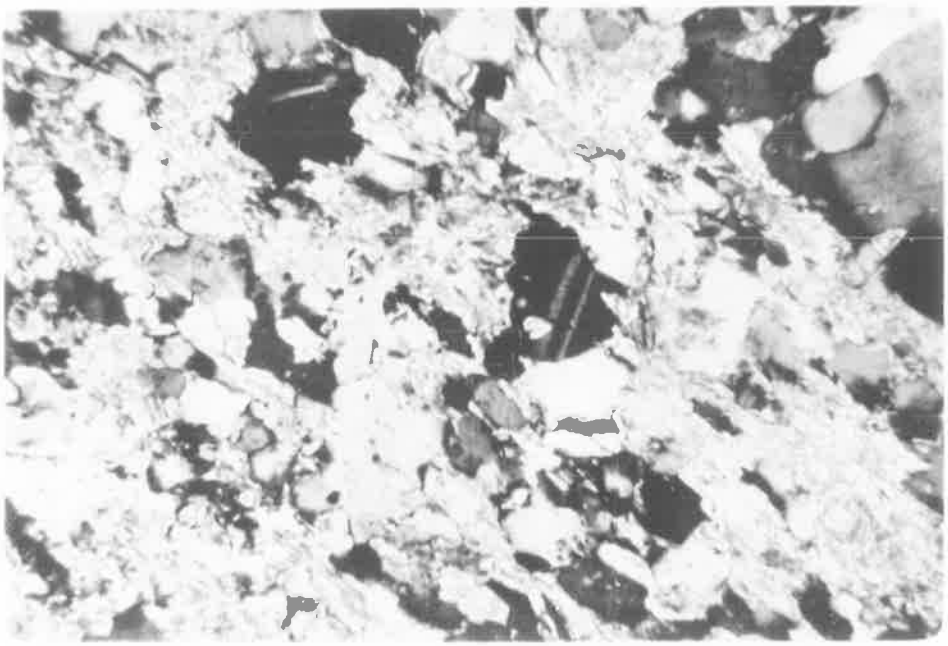


PLATE XXXIII.

TS 4320 - Victoria Creek Marble. Weakly foliated quartz-feldspar-talc schist containing isometric crystals of pyrite, often aligned along the foliation (slide from Southern Hills DDH 5, 148.7 metres depth).

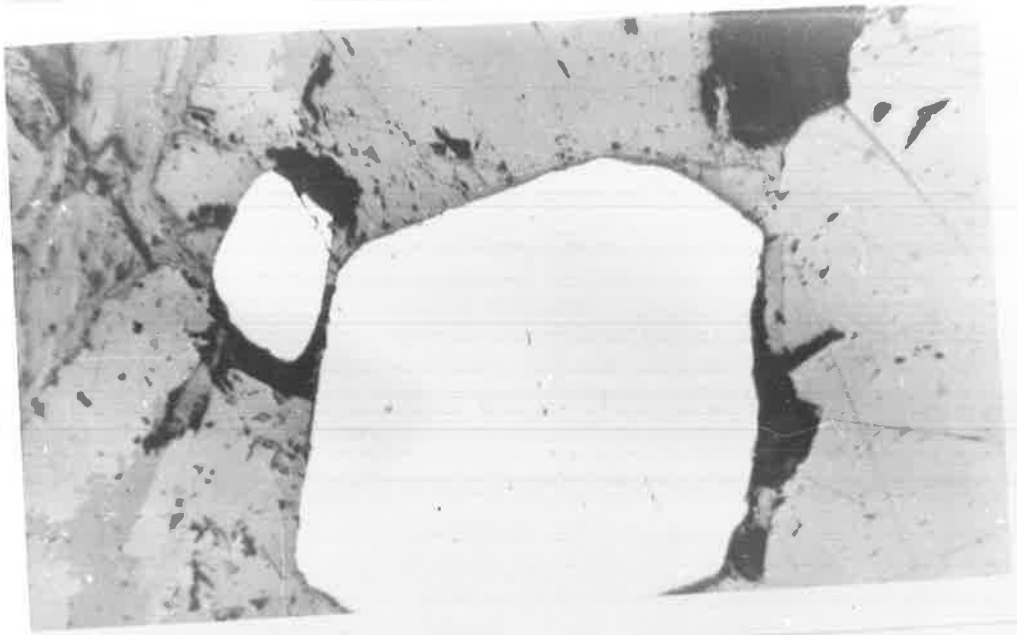
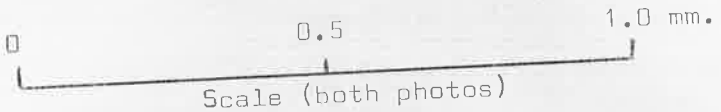


PLATE XXXIV.

PS 4328 - Victoria Creek Marble. Subhedral crystals of pyrite, typically dispersed within tale . Southern Hills DDH 5, 155.5 metres depth.



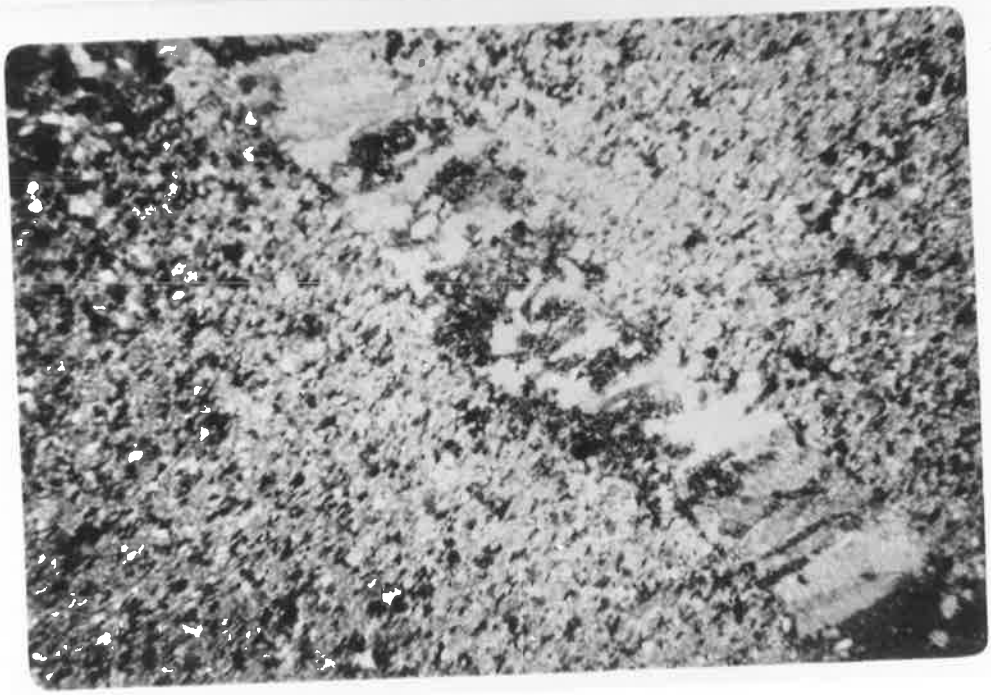


PLATE XXXV.

TS 4314 - Victoria Creek Marble, at contact with Pipeline Schist. Metasomatized quartz-feldspar-mica schist. Transverse fissure filled with clay and carbonate crossing parallel aligned flakes of biotite. Southern Hills DDH 5, 139.5 metres depth.

PLATE XXXVI.

TS 4306 - Pipeline Schist. Isolated but generally aligned biotite flakes in layers alternating with a granoblastic fine-grained mosaic of quartz and feldspar. Southern Hills DDH 5, 100.0 metres depth.

0 0.5 1.0 mm.

Scale (both photos)

PLATE XXXVII.

TS 4312 - Pipeline Schist. Polygonal xenoblastic feldspar and quartz enclosed among semi-continuous trains of biotite flakes showing alteration to chlorite along the grain margin. Sparse distribution of sub-idioblastic tourmaline. Southern Hills DDH 5, 134.0 metres depth.

0 0.5 mm.
Scale

PLATE XXXVIII.

PS 4301 - Pipeline Schist. Minute grains of chalcopyrite randomly distributed within pyrite, which occurs as irregular anhedral grains distributed along the foliation. The pyrite grain size is consistent with the grain size of the silicate minerals. Southern Hills DDH 5, 78.0 metres depth.

0 0.1 mm.
Scale

PLATE XXXIX.

PS 4301 - Pipeline Schist. Idioblastic grain of arsenopyrite within feldspar-quartz-mica schist. Southern Hills DDH 5, 78.0 metres depth.

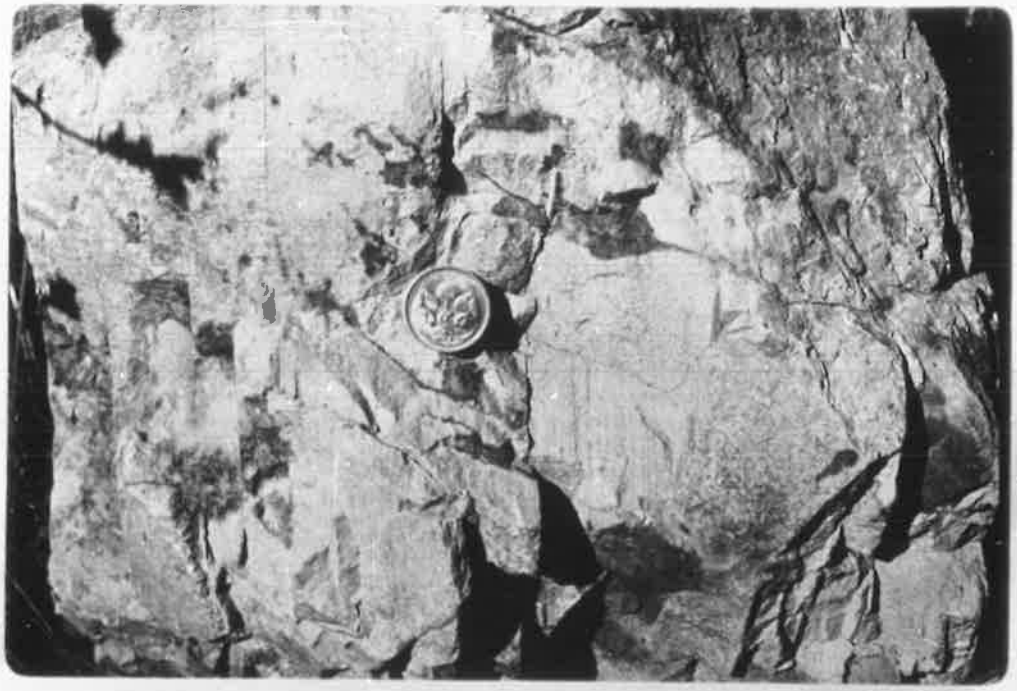


PLATE XL.
Pink arkosic quartzite marker bed in Pipeline Schist, outcropping in Southern Hills Prospect.

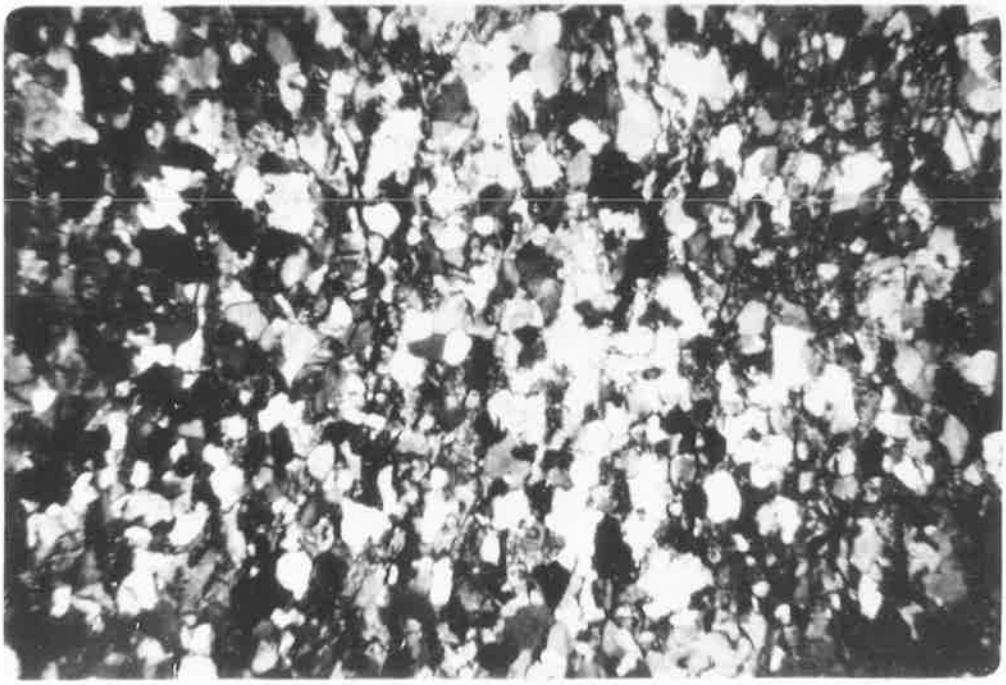


PLATE XLI.
TS 4309 – Pipeline Schist. Granoblastic mosaic of quartz and feldspar (equal proportion of potash and plagioclase) with aligned biotite and rare muscovite. Southern Hills DDH 5, 110.4 metres depth.
0 0.5 mm.
Scale

2x enlargement

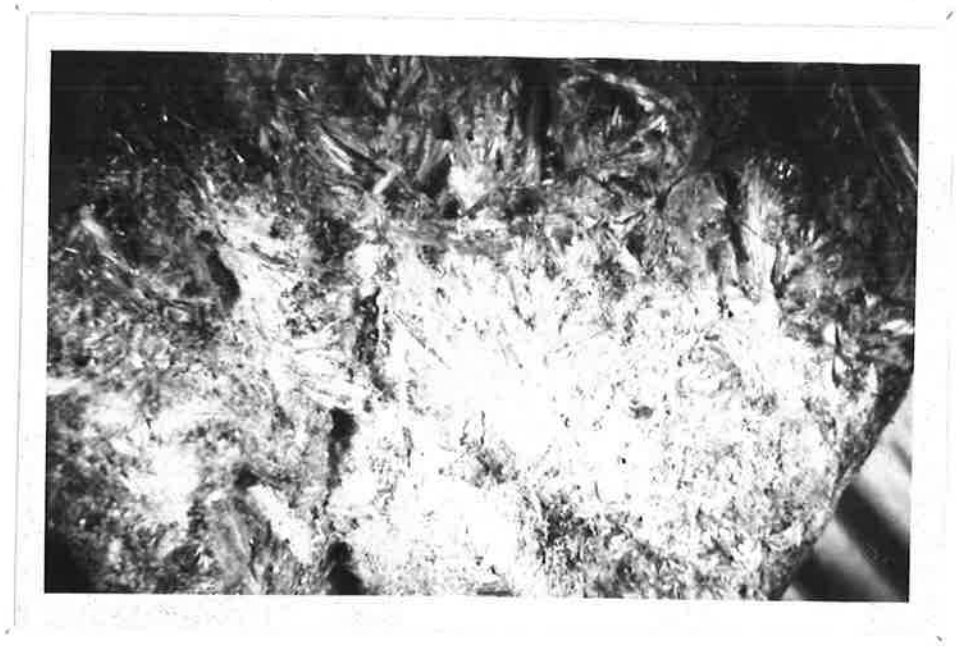


PLATE XLII.
Thin actinolite bed within calc-silicate member of the Pewsey Vale Formation. Locality: north-east from Springfield Homestead

Natural scale

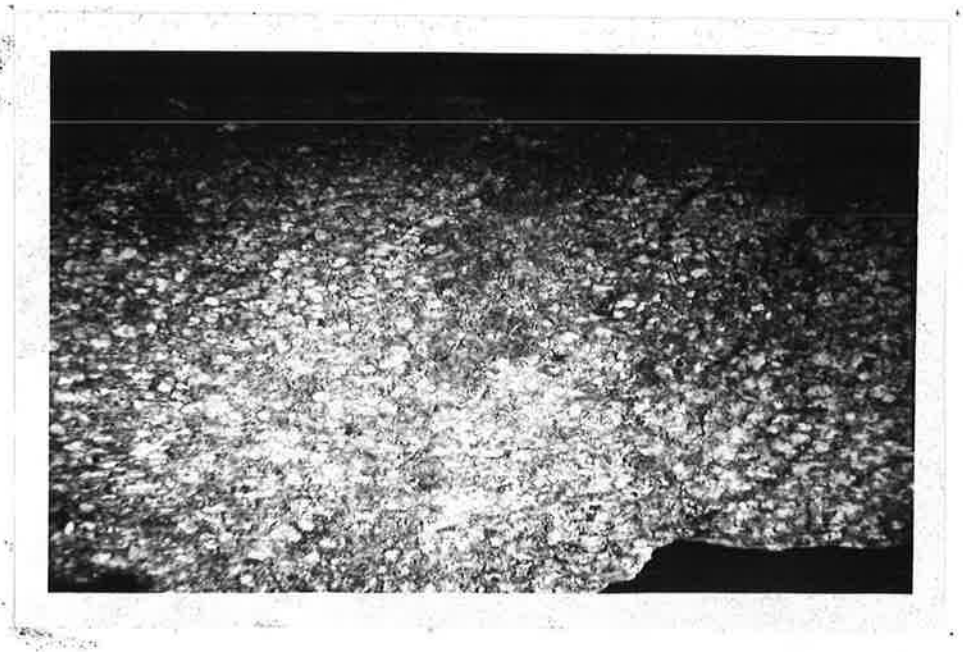


PLATE XLIII.
Saccharoidal appearance of typical diopside-scapolite rich calc-silicate bed within the Pewsey Vale Formation. Locality: north-east from Springfield Homestead

PLATE XLIV.

Dilational pegmatite exposed in road cutting just south of the road bridge over the Warren Reservoir. Note the alteration rim of biotite, and minor folding of the pegmatite.

0 1 metre

Scale

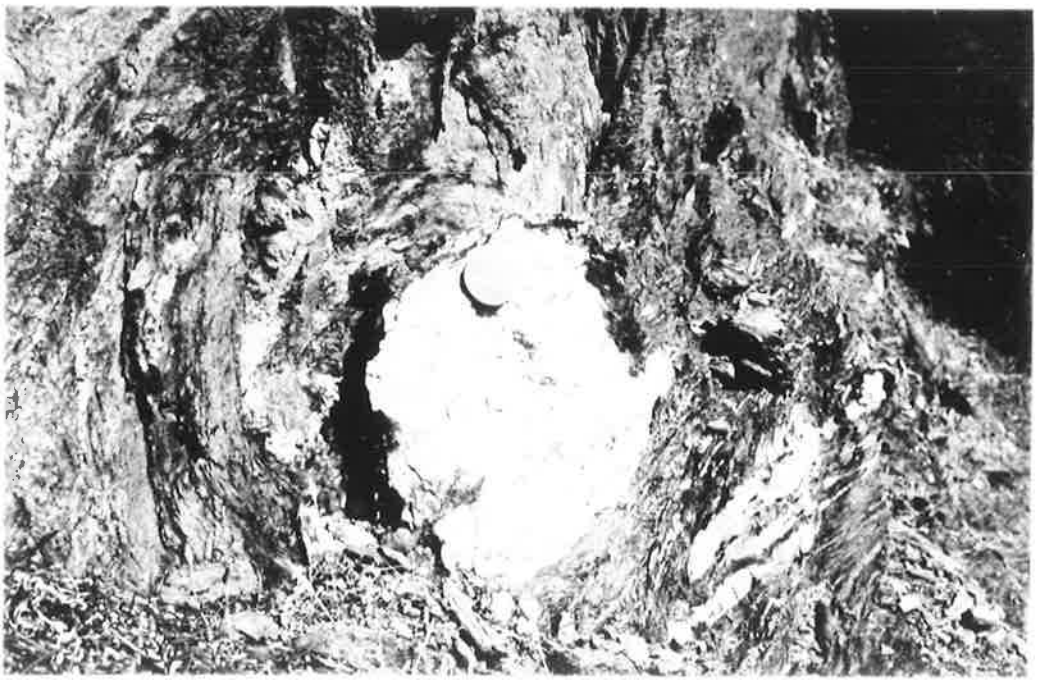


PLATE XLV.

Replacement pegmatite cutting across foliation. Locality: along track to dam wall, north side of Warren Reservoir.

PLATE XLVI.
Gneissose amphibolite in Springfield Sub-Group, from just north of Victoria Creek (natural scale).

0 0.5 mm.
Scale

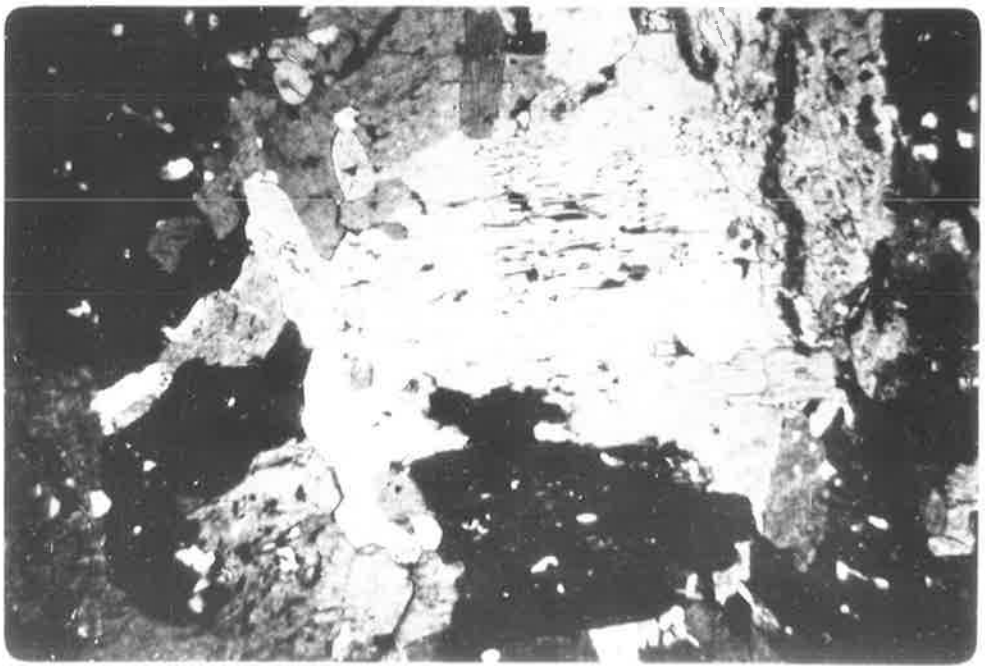


PLATE XLVII.
TS 4629 - Amphibolite. Granoblastic mosaic of irregular and intergrown crystals of strongly pleochroic hornblende. Exsolved granular inclusions of iron oxide suggest derivation from original pyroxene. Southern Hills DDH 5, 208.0 metres depth.

PLATE XLVIII.
Severe surface creep affecting rocks of the Pipeline Schist. The distortion of dip and strike is well illustrated in this road cutting on the Southern Hills Prospect.

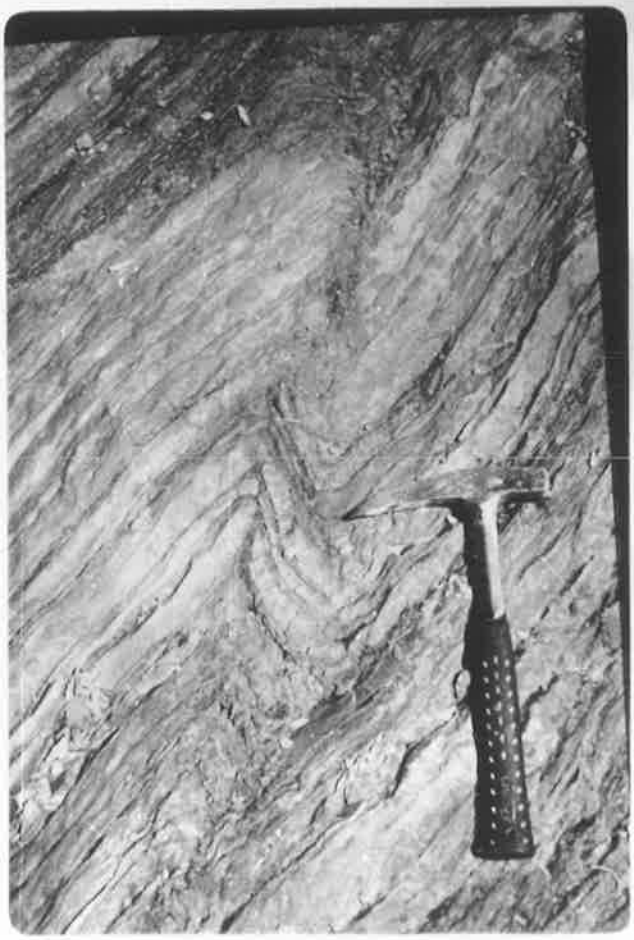


PLATE XLIX.
First generation fold in phyllite in the Saddleworth Formation, exposed in the north bank of the South Para River east of the road bridge.

PLATE L.

Tight, sawtooth second generation folds developed in the Ukaparinga Schist, Ukaparinga open cut.

0 50 cm.

Scale

PLATE LI.

Crenulation cleavage S_2 developed parallel to the axial surfaces of the second generation folds. Southern Hills DDH 2, 88.5 metres depth (specimen enlarged 2x).

PLATE LII.

TS 4107 - Ukaparinga Schist. Second generation folding of S_1 cleavage in Southern Hills DDH 2, 88.5 metres depth.

0 0.5 1.0 mm.

Scale (both photos)

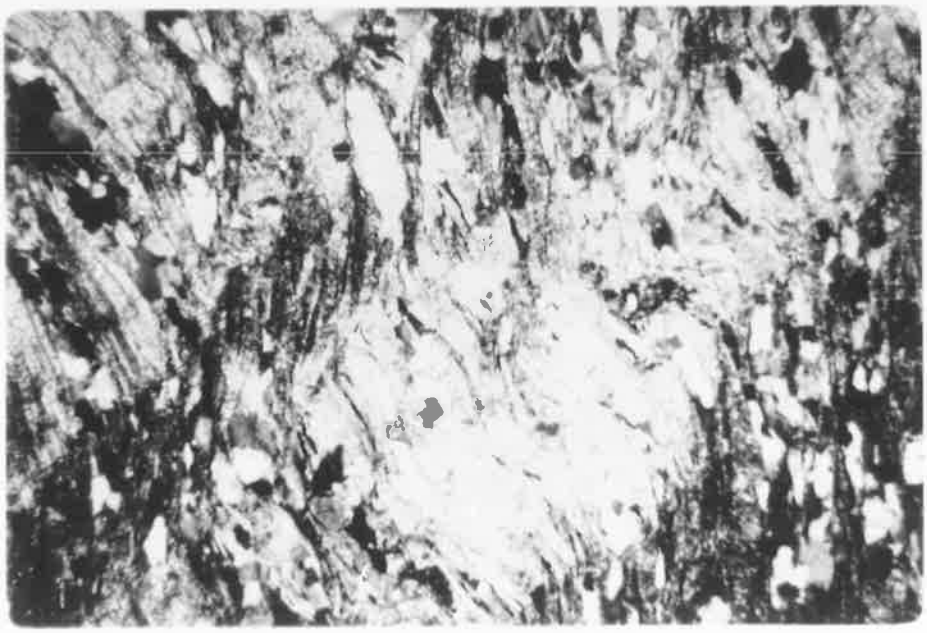


PLATE LIII.

TS 4661 - Pipeline Schist. Regular warping of S_2 cleavage suggesting third generation folding (Southern Hills area).

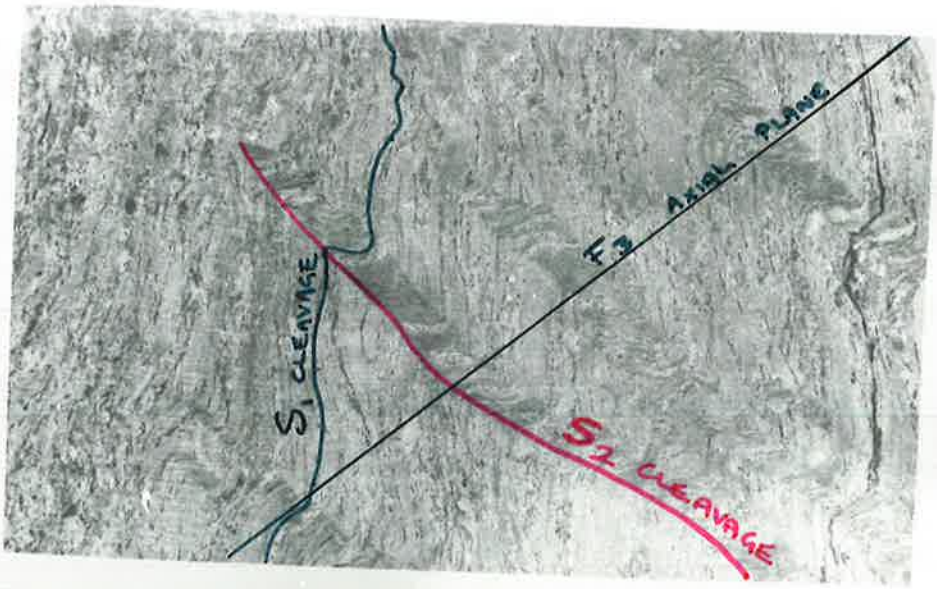


PLATE LIV.

Ukaparinga Schist, showing relationships of three phases of deformation (specimen from Southern Hills Prospect).

0 1 2 cm.

Scale

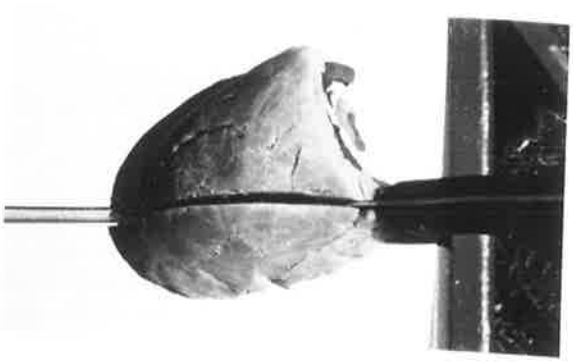
PLATE LV.

Typical jointing in the Warren Schist, outcropping along the pipeline track west of the Warren Reservoir.

PLATE LVI.
Looking north along the Kitchener Fault from the Ukaparinga Mine.

PLATE LVII.
Taking readings at a bench mark station with the gravity meter.

ORIGINAL MODEL



SLICE SIMULATING KITCHENER FAULT

SEPARATION AFTER SLICING

HORIZONTAL SLICE REPRESENTING EROSION

PLAN VIEW AFTER "EROSION"

REJOINING SEPARATED SLICES

EXPOSING BIOTITE ZONE ON ORIGINAL SLICE WEST OF KITCHENER FAULT

REJOINED PIECES SHOWING FAULT MOVEMENT NECESSARY TO HAVE THE PRESENT JUXTAPOSITION OF METAMORPHIC ZONES

PLATE LVIII – KITCHENER FAULT MODEL STUDIES

PLATE LIX.
Open cut - Ukaparinga Mine

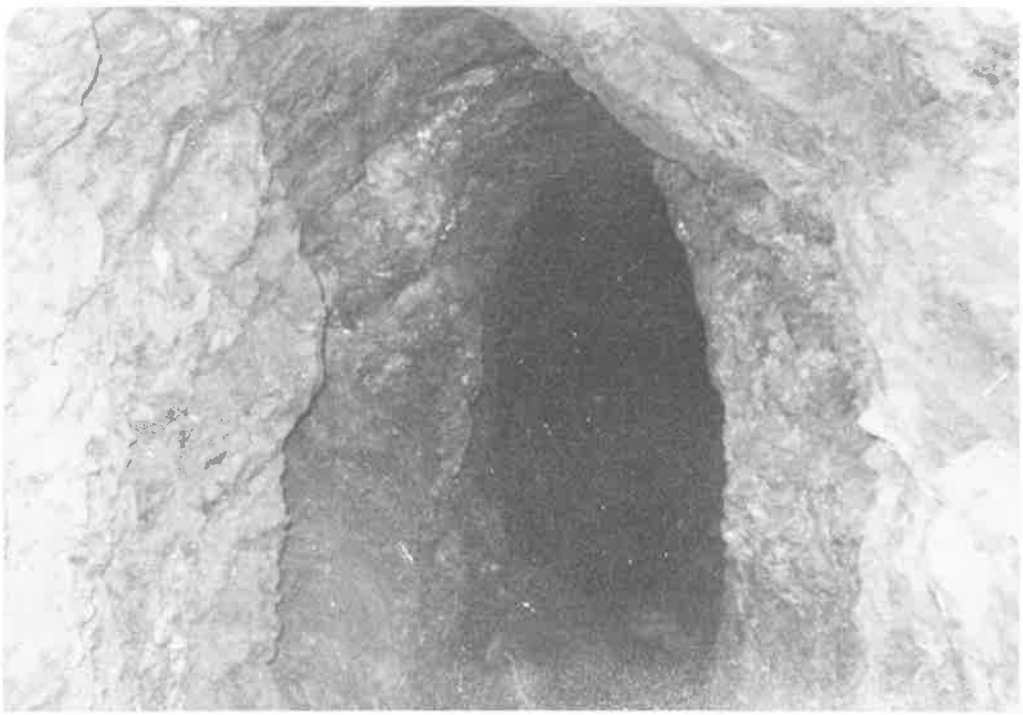


PLATE LX.
Inside the Ukaparinga Mine adit, showing azurite and malachite in the Ukaparinga Schist.

PLATE LXI.
Looking north-west from Hale National Park to the drill sites on the eastern side of the Ukaparinga Mine hill.

PLATE LXII.
Longyear 38 diamond drill, Ukaparinga DDH 3.

PLATE LXIII.
Looking due South at percussion drill sites on the northern end of the Southern Hills Prospect. Note the white outcrops of Victoria Creek Marble in the road cuttings.

PLATE LXIV.
Schramm rotary-percussion drill collaring PDH 2, Southern Hills Prospect. South Para Reservoir in background to west.

PLATE LXV.
Close-up view of azurite veins in Ukaparinga Schist, exposed in the open-cut in the Ukaparinga Mine.

PLATE LXVI.
Chalcopyrite in diamond drill core.

PLATE LXVII.

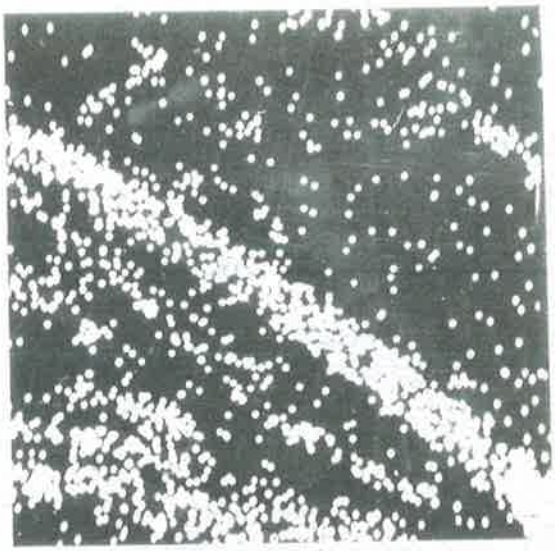
Electron probe photomicrographs illustrating element distribution and grain shape in biotite flakes from the +208 µm leached portion of a cyclosized bulk sample of Ukaparinga PDH 26 (from the interval 16.75 to 18.3 metres hole depth). Assay before leaching was 1.35% copper, and after agitation leaching for 21 hours in sulphuric acid at pH 1.5-1.7 maintained by the addition of acid (the equivalent of 32 kgm per tonne of ore) and ferric sulphate (the equivalent of 83 kgm per tonne of ore), the assay of the leach residue was 1.32% copper,,or about 2% recovery.

The flakes are mounted with the cleavage surface parallel to the mount surface. Field of view is approximately 100 µm.

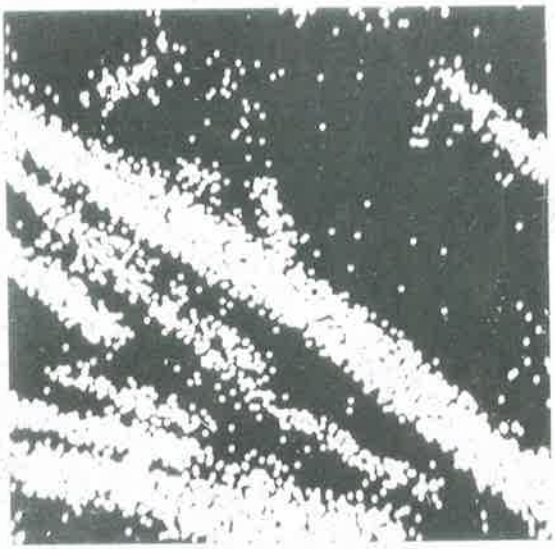
In this and subsequent electron probe photomicrographs the whitest areas in the element distribution image contain the highest element concentration.

PLATE LXVII

Secondary electron image showing grain shape



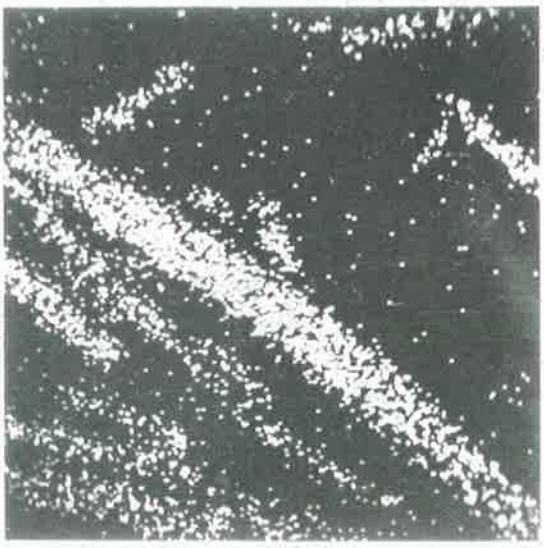
Copper Kα image



Silicon Kα image

Aluminium Kα image

Magnesium Kα image



Iron Kα image

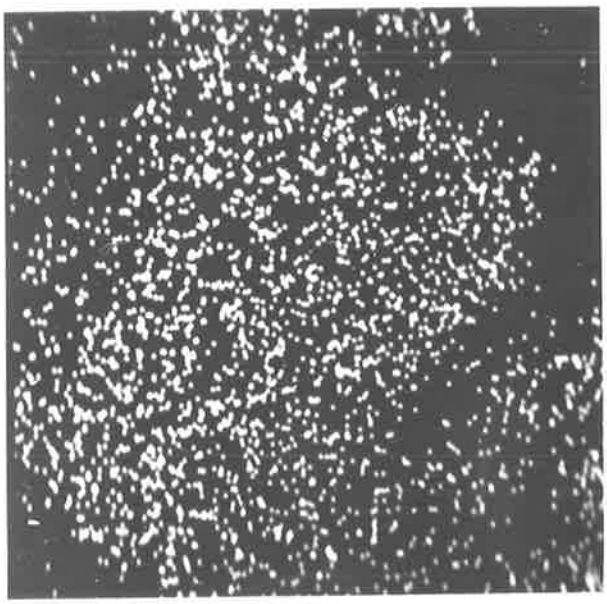
PLATE LXVIII

As for the previous plate, except that here the biotite laths are oriented with the cleavage surface perpendicular to the mount surface, and the field of view is approximately 200 μm.

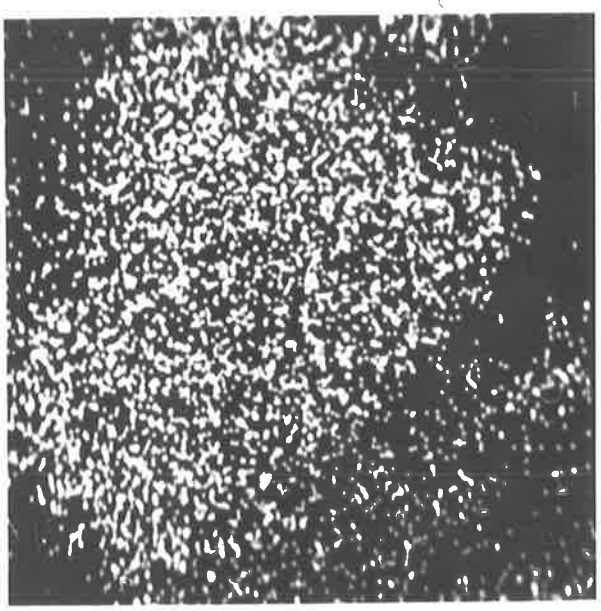
PLATE LXVIII.

Copper Kα image

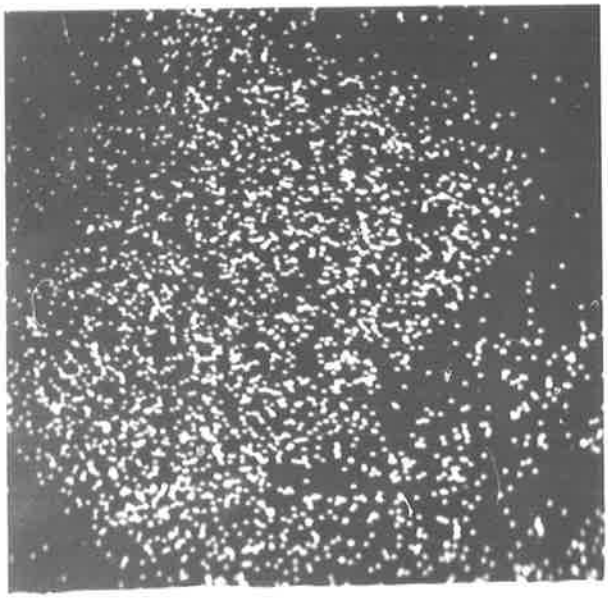
Secondary electron image showing grain shapes



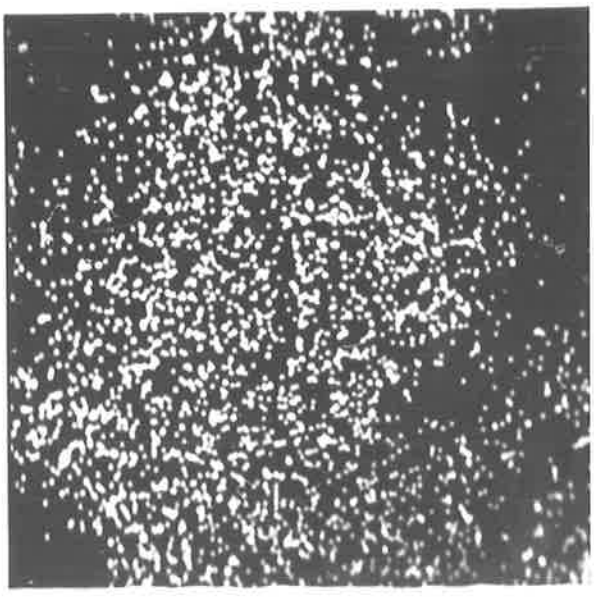
Aluminium Kα image



Silicon Kα image



Iron Kα image



Magnesium Kα image

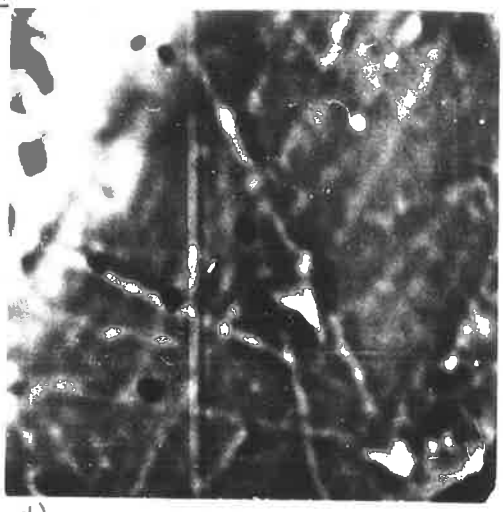
PLATES LXIX AND LXX

These (and the remaining Plates LXXI - LXXVIII) were supplied by Dr.Keith Henley and result from the study he undertook at my request (Henley, 1972; Henley and Jones 1974).

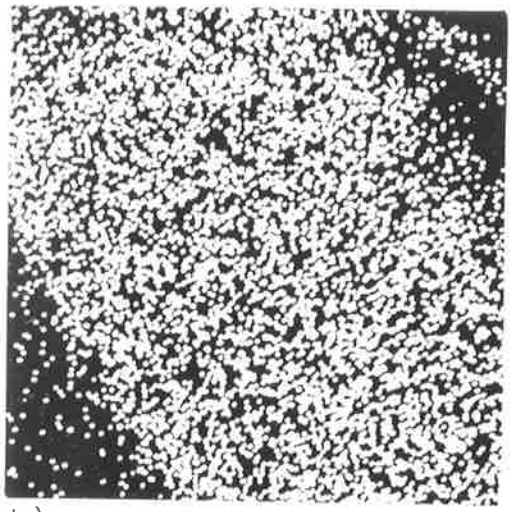
The electron probe photomicrographs show biotite flakes in the unleached and leached ground ore respectively from the same sample as illustrated in the preceding two plates. Field of view in each case is approximately 100 μm.

PLATE LXIX

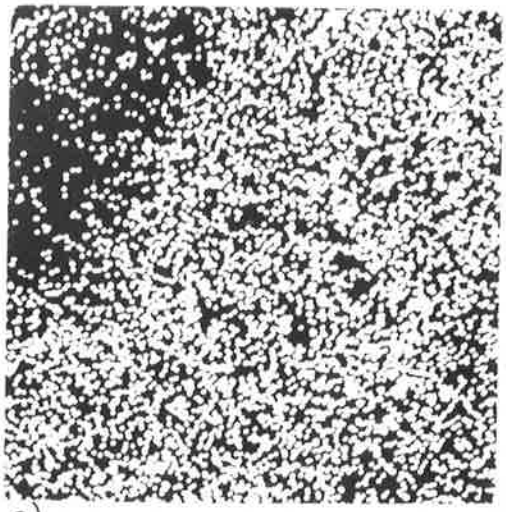
a) A.E.I.
Absorbed electron image showing shape of Flake 1



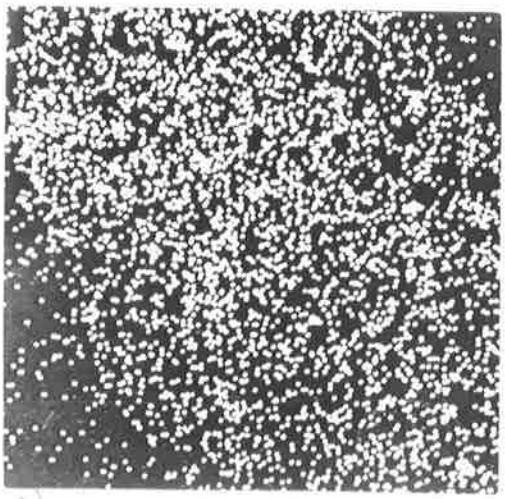
d) A.E.I.
Absorbed electron image showing shape of Flake 2



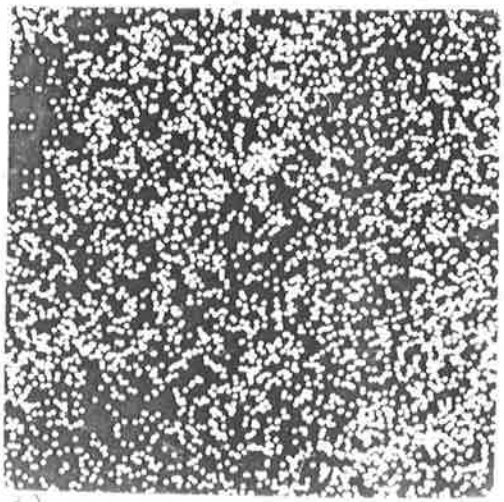
b) K
Potassium Kα image of Flake 1



e) K
Potassium Kα image of Flake 2



c) Cu
Copper Kα image of Flake 1

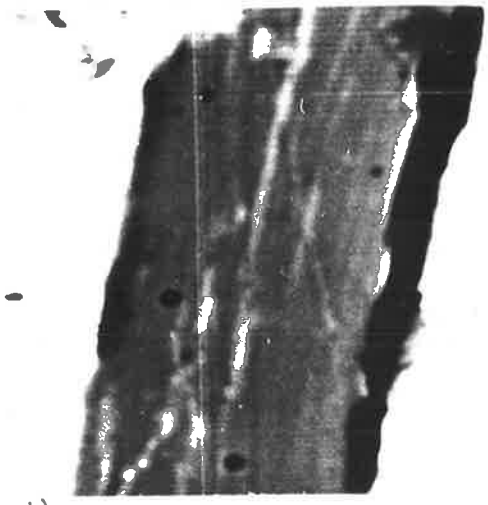


f) Cu
Copper Kα image of Flake 2

PLATE LXX

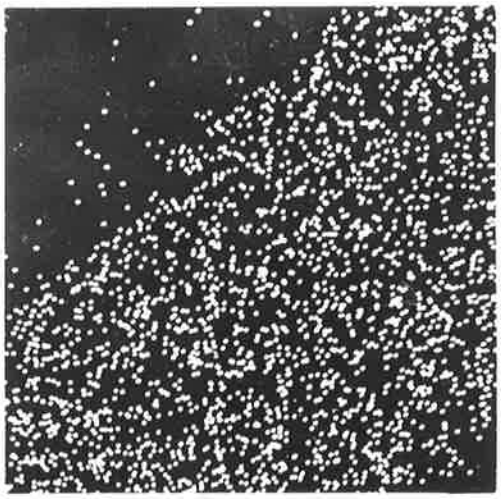
a) A.E.I.

Absorbed electron image showing shape of Flake 3



d) A.E.I.

Absorbed electron image showing shape of Flake 4



b) K.

Potassium Kα image of Flake 3

e) K.

Potassium Kα image of Flake 4

c) Cu

Copper Kα image of Flake 3

f) Cu

Copper Kα image of Flake 4

LEACHED ORE

PLATES LXXI - LXXV

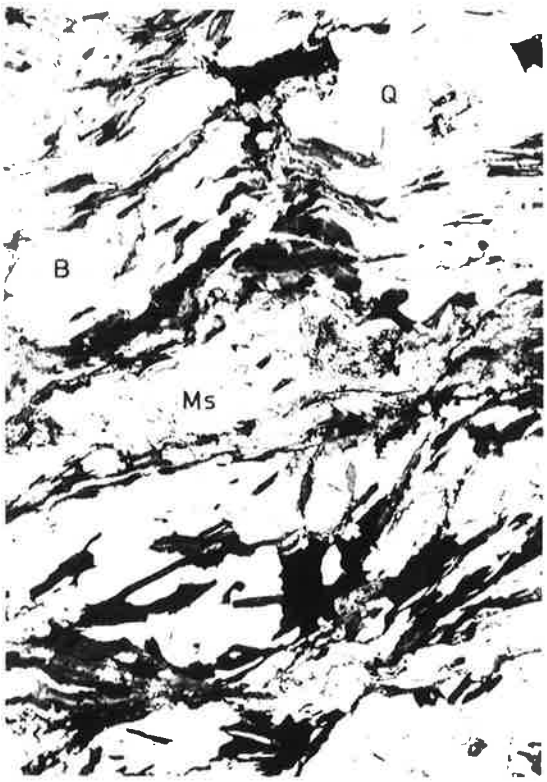
Photomicrographs of core samples from Ukaparinga DDH 2, taken in plane-polarized transmitted light at a magnification of x12.

This 40-metre (downhole) unweathered section of drill core was chosen for detailed study as it represented an intersection of 0.85% copper as primary chalcopyrite over a true thickness of 16 metres, and included sections grading up to 2.1% copper over true widths of 1.5 metres. Hence it provided the best opportunity to study comprehensively the mineralogy of the ore.

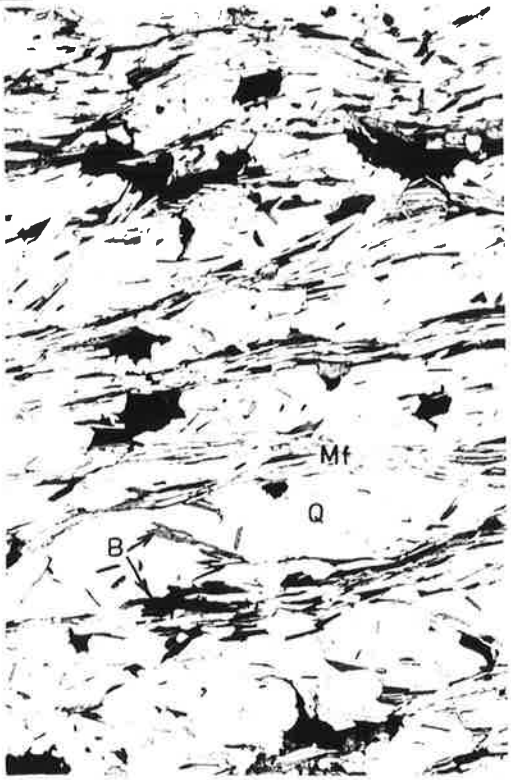
Symbols used for the various minerals are as follows:

Q = Quartz
Mf = Muscovite (flaky)
Ms = Muscovite (sericitic)
B = Biotite
C = Chlorite
T = Tourmaline
S = Staurolite
F = Feldspar

PLATE LXXI.



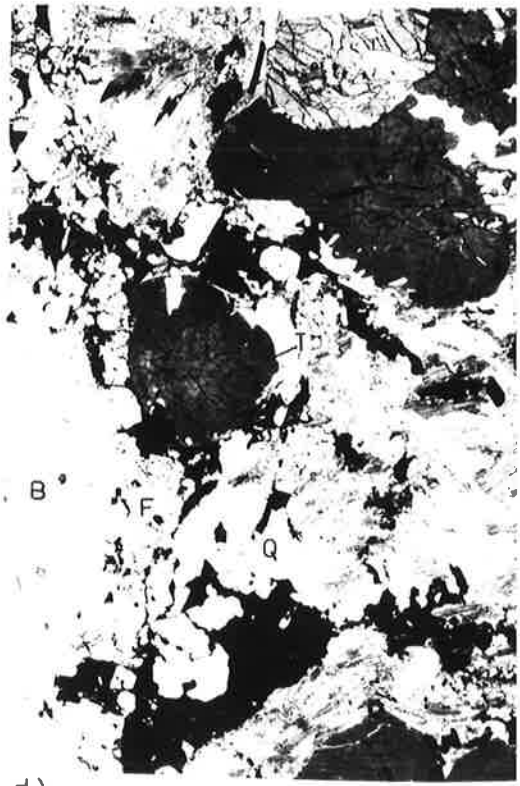
a) 97.5 m.



b) 102.4 m.

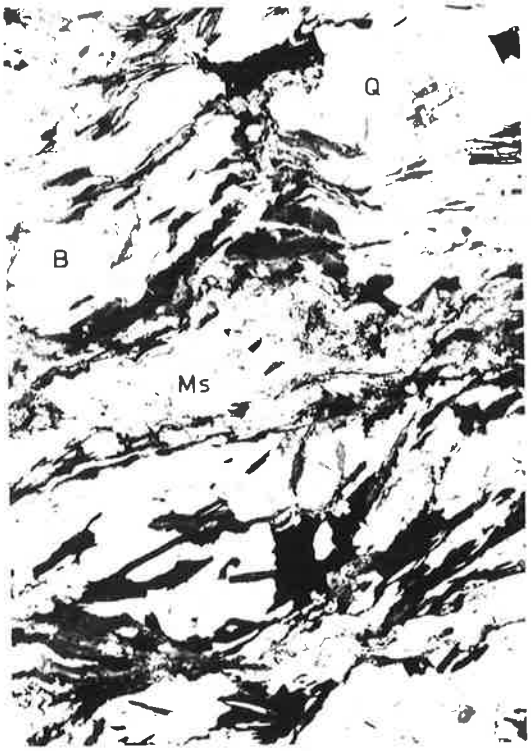
2 mm

c) 106.8 m.

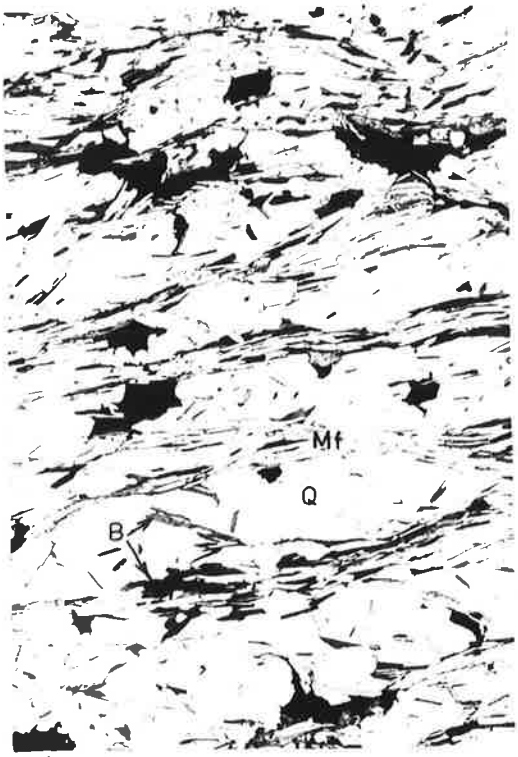


d) 106.8 m.

PLATE LXXI



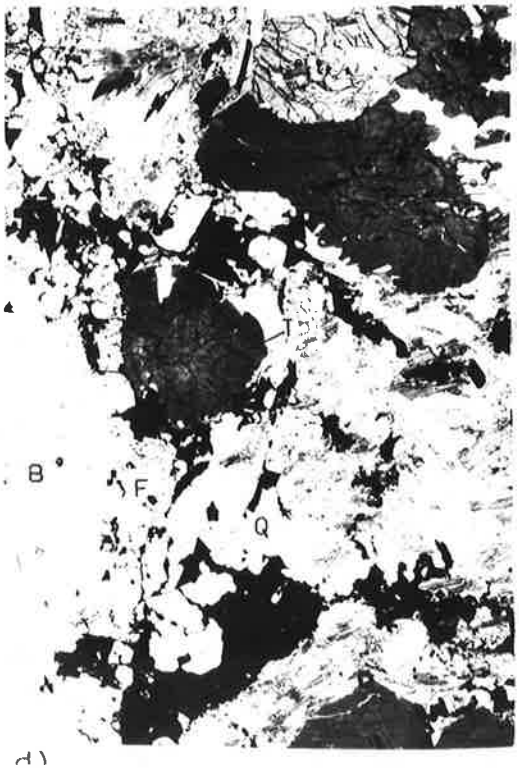
a) 97.5 m.



b) 102.4 m.

2 mm

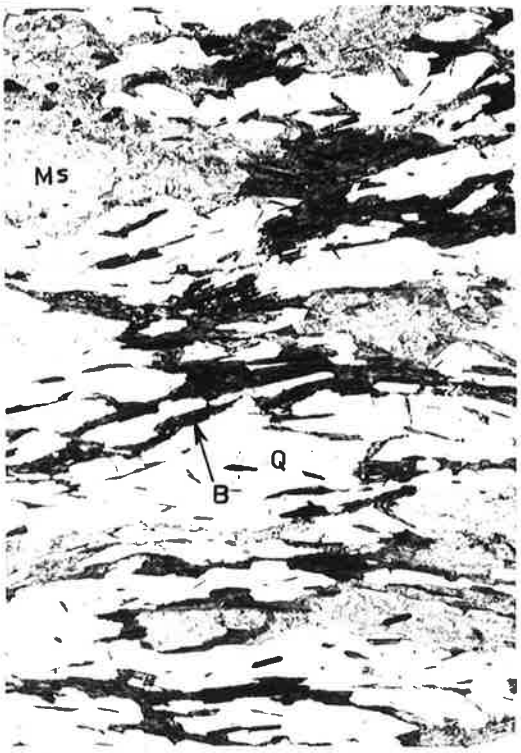
c) 106.8 m.



d) 106.8 m.

PLATE LXXII

a) 107.5 m.



b) 112 m.

2 mm

c) 114 m.

d) 119 m.

PLATE LXIX.

UKAPARINGA SCHIST - THIN SECTIONS - DDH 2

a) TS 4364. Quartz segregation in biotite-chlorite schist. Where quartz is in contact with chalcopyrite it has curious lobate margins, possibly indicating replacement by chalcopyrite.

b) TS 4365. Banded mica schist. The upper band is composed of sericitic muscovite, biotite and chlorite with minor quartz and chalcopyrite. Lower is predominantly quartz.

2 mm

c) TS 4367. Sericitic muscovite, biotite & chlorite intergrown with quartz & opaques.

d) TS 4368. Well-developed schistosity defined by sub-parallel biotite, chlorite & muscovite.

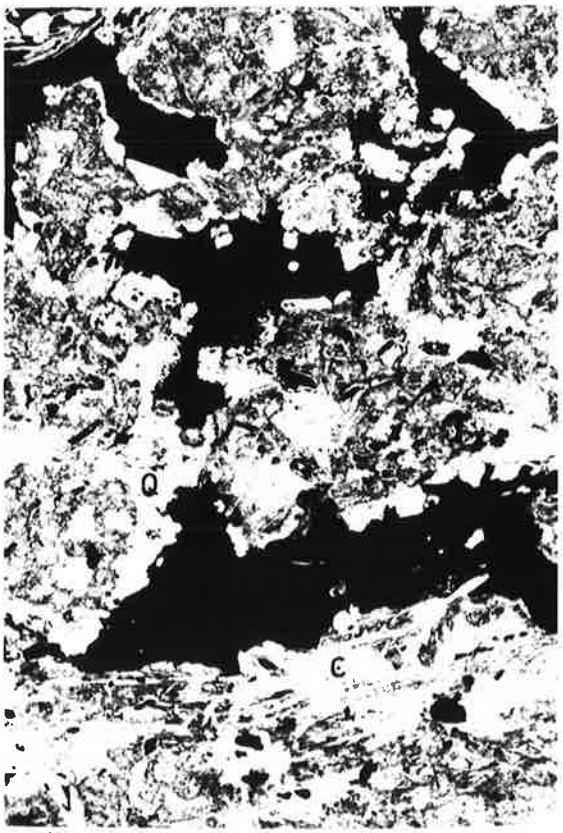
PLATE LXXIV

a) 126 m. Well-developed schistosity defined by sub-parallel flakes of B & C, elongate aggregates of Ms & elongate Q grains.

b) 132 m. Moderately developed schistosity defined by sub-parallel flakes of B & C & elongate Q grains.

2 mm

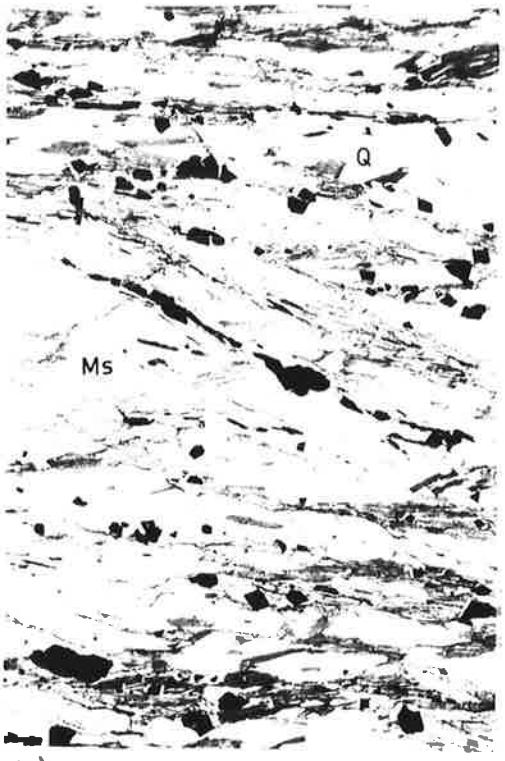
c) 133 m. Highly chloritized schist with B relicts & minor opaques & Q.



d) 136.5 m. Abundant anhedral opaques (mainly P & Cp) locally marginned by Q.

PLATE LXXV

a) 136.5 m.



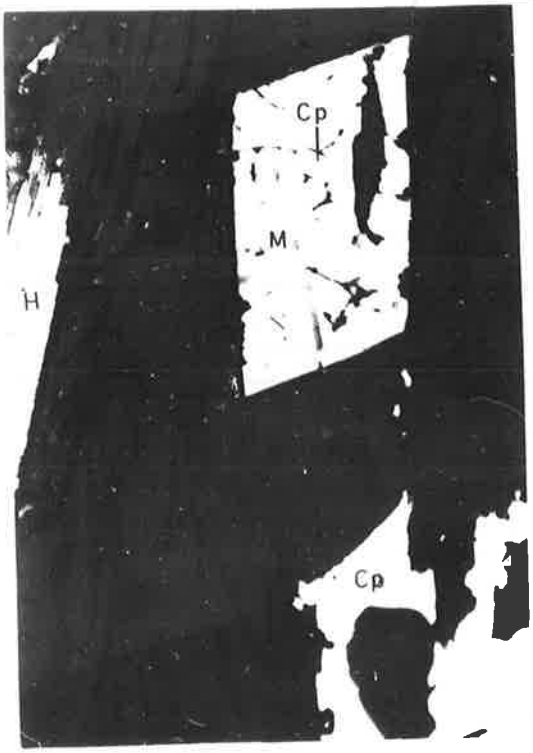
b) Oxidised ore from adit.

2 mm

c) As (b)

d) As (b).

PLATE LXXVI

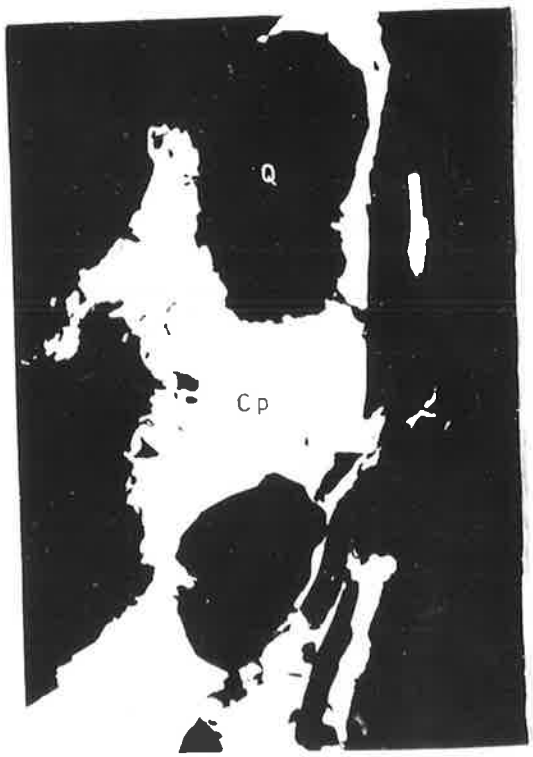


a)

b)

0·2 mm

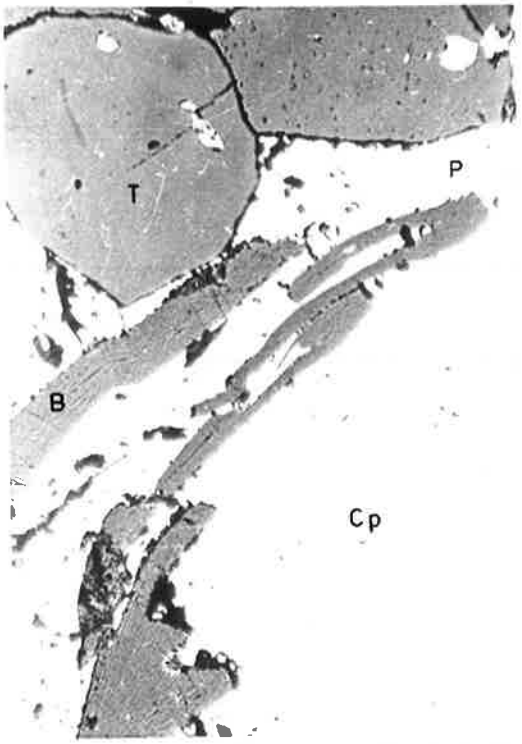
c)



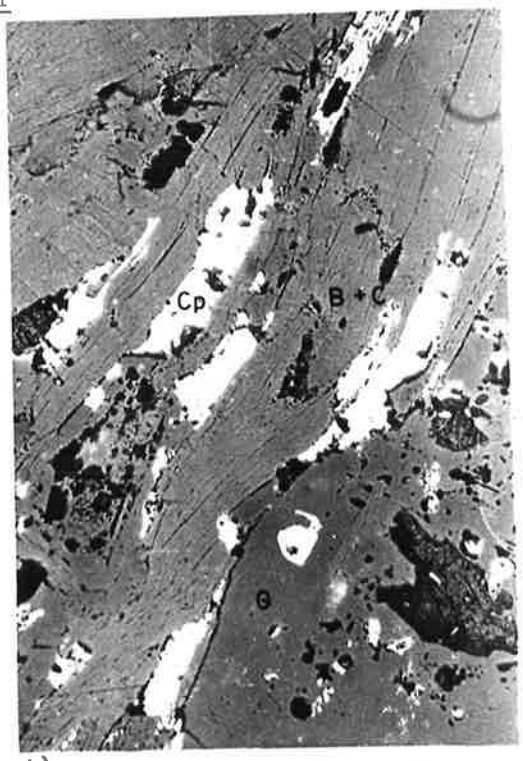
d)

SAMPLE AS SHOWN IN PLATE LXXI(c), UNPOLARIZED REFLECTED LIGHT.
MAGNIFICATION ×98.

PLATE LXXVII

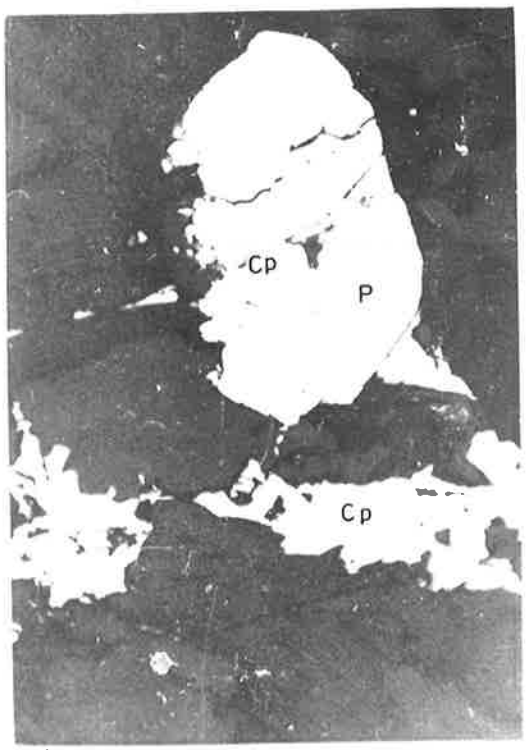


a) Euhedral T grains & B flakes are enveloped in Cp & P with no obvious signs of replacement.

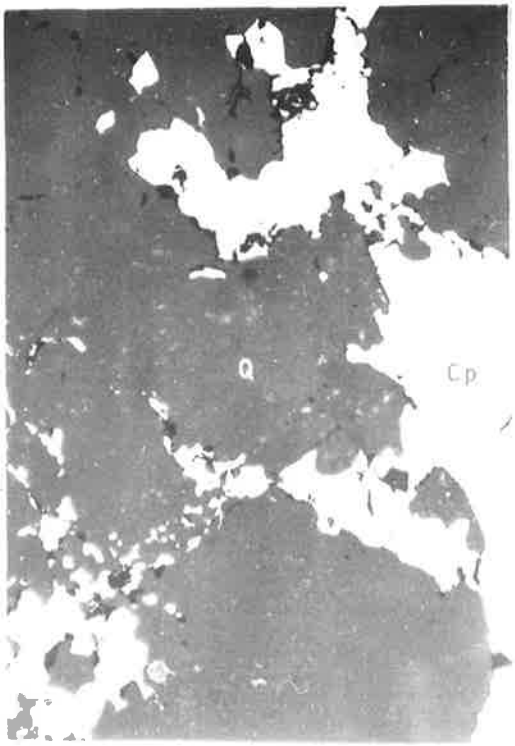


b) Cp grains show elongation parallel to, & intricate interleaving with, the micaceous schistosity.

0·2 mm

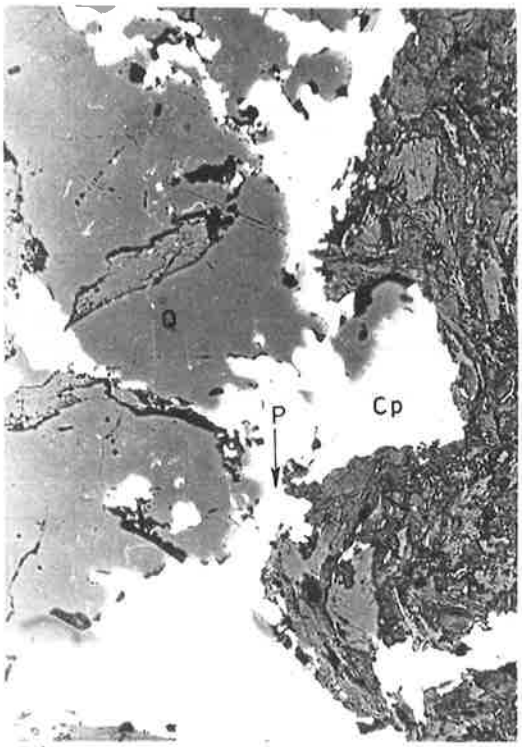


c) A subhedral P grain has been fractured & veined by Cp.

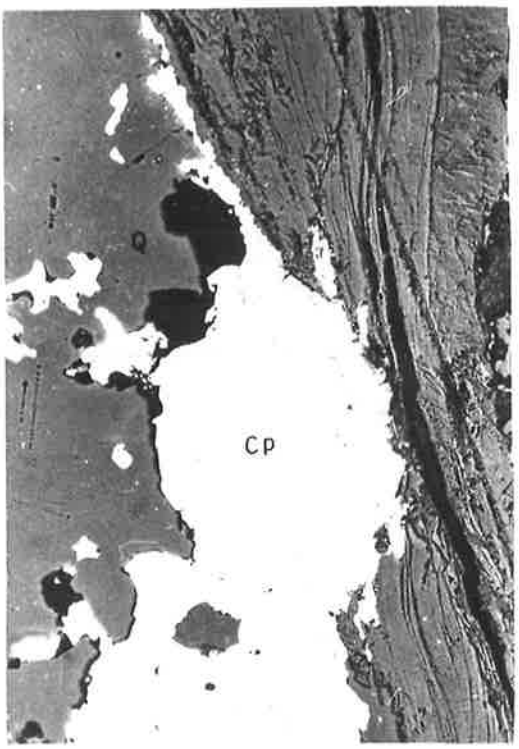


Anhedral Cp is moulded on & intergrown with Q down to very fine sizes.

PLATE LXXVIII

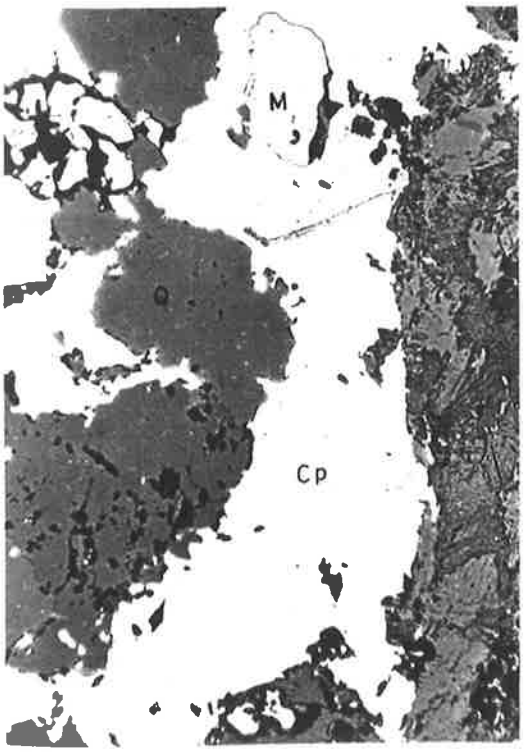


a) 120.5 m.

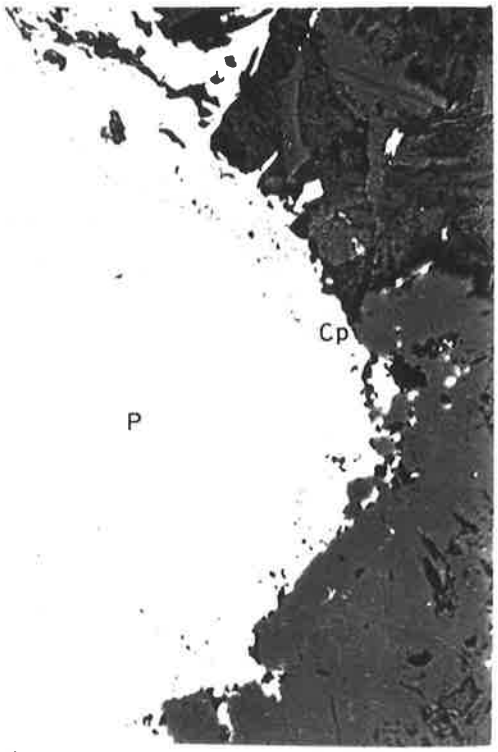


b) 120.5 m.

0·2 mm



c) 120.5 m.



d) 120.5 m.