

EL 17 / 73

**DESCRIPTION OF
GOLD-BEARING CARBONATE ROCK**

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Allstate Explorations N.L.
Suite 3107,
Tower Building,
Australia Square,
SYDNEY, NSW 2000

Attention: A. Silver

74-1004

REPORT MP 3929/74

YOUR REFERENCE:

Letter dated April 16th and
telex

MATERIAL:

Two drill core samples

LOCALITY:

Beaconsfield, Tasmania

IDENTIFICATION:

Samples 1 and 2

DATE RECEIVED:

21-4-74

WORK REQUIRED:

Petrographic and mineragraphic
description, analysis for total
and cyanide soluble gold and
tellurium and colour photo-
graphs to shows mineral
associations

Investigation and Report by: Sylvia Whitehead

Chemical Analysis: M.R. Hankel

Officer in Charge, Mineralogy/Petrology Section: Dr K.J. Henley



for F.R. Hartley
Director

mhb

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These two samples are similar to samples 602, 603 and 609 submitted previously in that pyrite is the most abundant sulphide. It is associated with carbonate and minor quartz.

In these two samples the pyrite has been extensively fractured and the other sulphides - mainly chalcopyrite, galena and minor sphalerite occur in the fractures and interstices between pyrite fragments.

Very few minute particles of gold were found included in pyrite grains. Analytical results show that the cyanide soluble gold in each sample is considerably less than the total gold almost certainly because much of the gold occurs as minute particles locked in pyrite grains.

Samples 602, 603 and 609 were all found to have less than 1 ppm tellurium.

Sample No. 1 TS 32270 PS 22003

Drill Hole:

A6 (WL) 3 at 1894' 9"

Rock Name:

Pyrite breccia with migratory chalcopyrite, galena, sphalerite and some carbonate-quartz gangue

Hand Specimen:

The sample is predominantly fine to medium grained, pale yellow sulphide intergrown with minor grey carbonate

Chemical Analysis:

Total gold 23.9 ppm. Cyanide soluble gold 0.6 ppm
Tellurium <1 ppm

Thin and Polished Sections:

A visual estimate of the constituents is as follows:

	%
Pyrite	80-90
Chalcopyrite	3-4
Galena	trace
Sphalerite	trace
Gold	2 minute inclusions or pyrite
Carbonate	5-10
Quartz	trace

The sample is composed mainly of a mass of coarse grained to medium grained pyrite which has been extensively fractured and crushed to form a pyrite breccia (Plate 1a) and minor amounts of carbonate, chalcopyrite, sphalerite and galena have crystallized in interstices and in fractures between the fragments of pyrite. The width of the veins of chalcopyrite, galena and sphalerite vary from 0.02 mm up to 0.08 mm and there are a few larger, irregular grains of chalcopyrite and sphalerite up to 0.2 mm in size in some interstices between fragments of pyrite.

Two very small particles of gold both approximately 4x8 microns in size were found included within pyrite grains (Plate 1b).

Much of the pyrite in this section is slightly anisotropic

possibly due to the presence of some impurity. This is not unusual.

The carbonate (ankerite or dolomite) is medium grained (0.05-0.2 mm) and it fills fractures and interstices between angular fragments of pyrite but a few carbonate crystals contain relatively small inclusions of pyrite. In one zone where there is less pyrite the carbonate is intergrown with a few grains of chalcopyrite up to 0.2 mm in size and some of this chalcopyrite clearly fills interstices between crystals of carbonate.

A little quartz is intergrown with some carbonate and one large (1 x 1.5 mm) quartz crystal shows evidence suggesting that it replaced some carbonate. It contains a few inclusions which appear to be remnants of carbonate and also a few of pyrite.

A little fine granular quartz forms a vein through some carbonate.

Conclusion:

This was vein material composed of pyrite and carbonate and it was extensively crushed. Carbonate probably migrated and recrystallized and, accompanied by migratory copper, lead and zinc sulphide minerals it now fills fractures and interstices in the pyritic breccia.

No free gold was found and only very small gold inclusions were found in some pyrite.

Sample No. 2 TS 32271 PS 22004

Drill Hole:

A6 (WL) 8 at 1900 ft

Hand Specimen:

A small piece of core composed of pyrite breccia with migratory chalcopyrite, galena, arsenopyrite and a trace of gold intergrown sulphide and carbonate

Chemical Analysis:

Total gold 22.6 ppm, cyanide soluble gold 8.0 ppm

Tellurium <1 ppm

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Thin and Polished Sections:

A visual estimate of the constituents is as follows:

	%
Pyrite	40-45
Chalcopyrite	5-10
Galena	2-3
Tetrahedrite	trace
Sphalerite	trace
Arsenopyrite	1-2
Gold	2 particles (4 microns) in pyrite
Carbonate	35-40
Quartz	10-15

This sample is also composed of an extensively fractured mass of coarse grained pyrite with carbonate and quartz now filling many of the fractures and interstices between the fragments (Plate 2a). Some of the carbonate is coarser grained (to 3 mm) than in sample 1 and these larger crystals show evidence of strain and incipient granulation between crossed nicols indicating that at least some carbonate was present before the vein material was fractured and crushed.

Chalcopyrite and galena occur sporadically in some fractures in the pyrite mass as veins which are generally less than 0.05 mm thick. Coarser grained chalcopyrite forms masses up to 1 mm across along some boundaries between pyrite and carbonate. It penetrates along some boundaries between carbonate crystals and surrounds a few small crystals of carbonate and of pyrite.

Galena is intergrown with chalcopyrite in these larger masses (Plate 2b) and it forms grains averaging 0.05-0.1 mm in size. A trace of tetrahedrite is associated with some galena and chalcopyrite and the largest tetrahedrite grain contains inclusions of another phase which may be bournonite. This is present in insignificant amounts.

Very few, very small grains of sphalerite are associated with the chalcopyrite and galena.

Arsenopyrite occurs in a few fractures in pyrite and some forms aggregates of crystals intergrown with quartz and carbonate in a few of the larger interstices between pyrite fragments. It varies in grain size up to 0.1 mm and does not appear to be

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associated with the chalcopyrite and galena.

Two minute particles of gold 4-5 microns in size were found included in pyrite but one of these is in a small fracture, an extension of which contains a little galena.

This specimen has had a similar history to that suggested for sample 1. in that vein material composed mainly of pyrite and probably carbonate has been fractured and some chalcopyrite, galena and traces of other sulphides have been deposited in fractures and interstices.

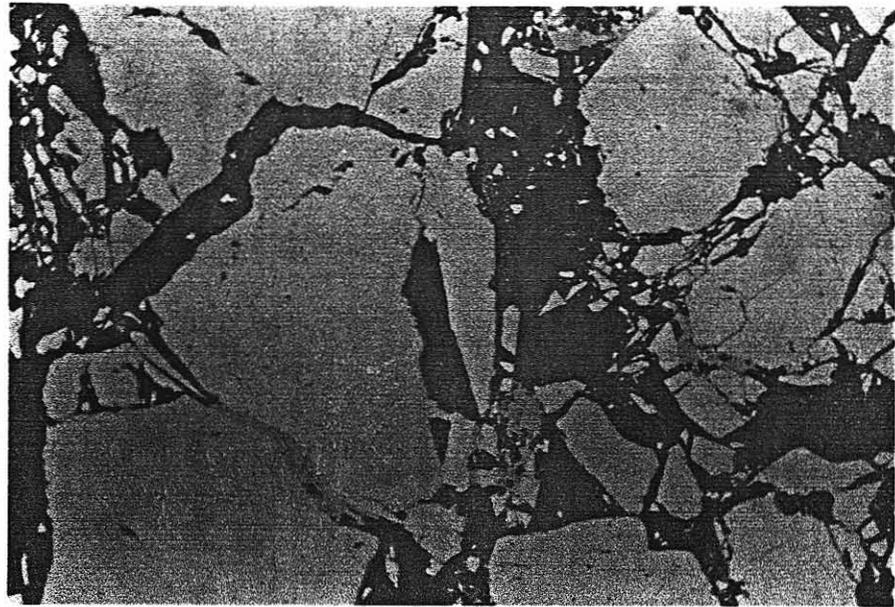
In addition this sample contains a little arsenopyrite which also crystallized after the pyrite was fractured.

Gold was found only as minute inclusions in pyrite.

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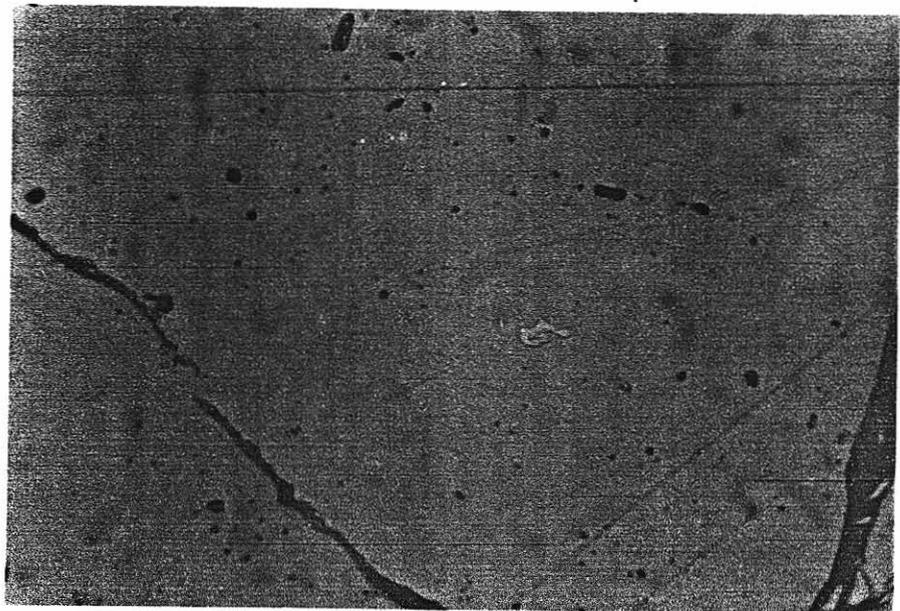
PLATE 1

- a. Polished section of sample 1. Chalcopyrite (darker yellow) and carbonate (reddish brown) have filled numerous fractures and interstices in extensively fractured pyrite (pale yellow)
- b. A gold particle (yellow) included in pyrite



A

0.1mm



B

0.1mm

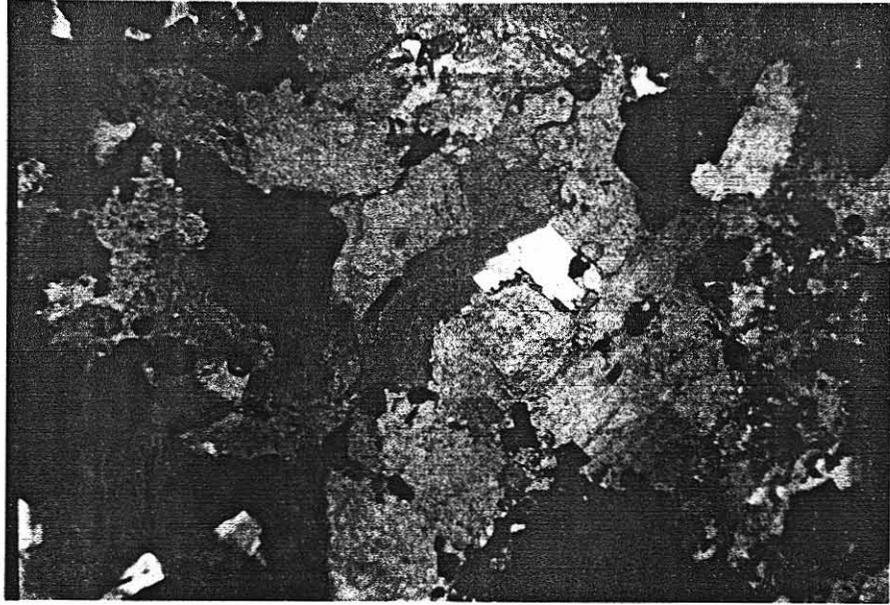
5 cm

PLATE 2

- a. Thin section of sample 2 with crossed nicols. This shows pyrite and other sulphides (black) with moderately coarse grained carbonate (yellow and various colours) and with a little quartz (white)

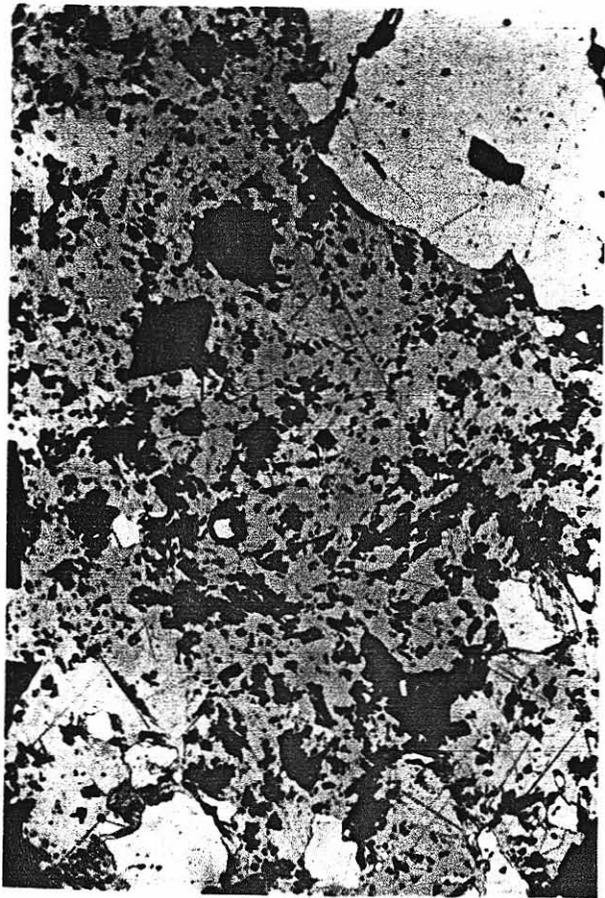
- b. Polished section of sample 2 showing chalcopyrite (darker yellow) and galena (bluish grey) with grains of pyrite (pale yellow)

- c. Extensively fractured pyrite (paler yellow) with small veins of chalcopyrite (orange) and of galena (bluish grey). One particle of gold (arrow) is included in pyrite



A.

1.0 mm



B



C.

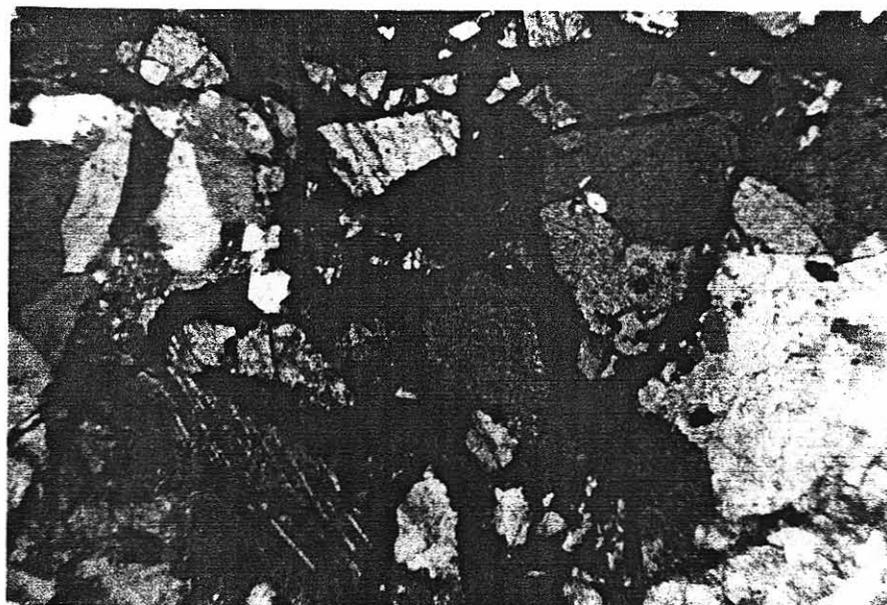
0.1 mm

0.1 mm

5 cm

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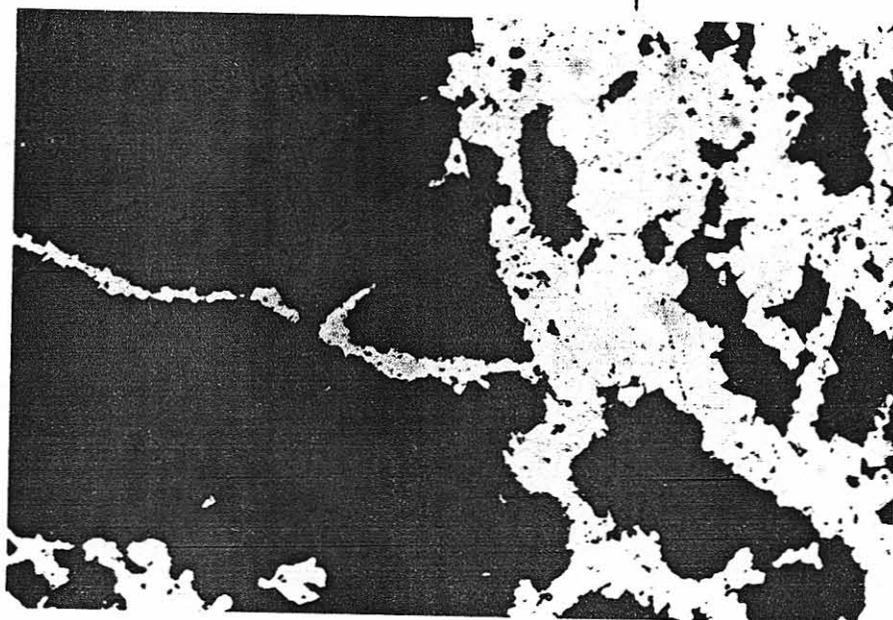
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there



A.

1 mm.

yrite



B.

0.1 mm.

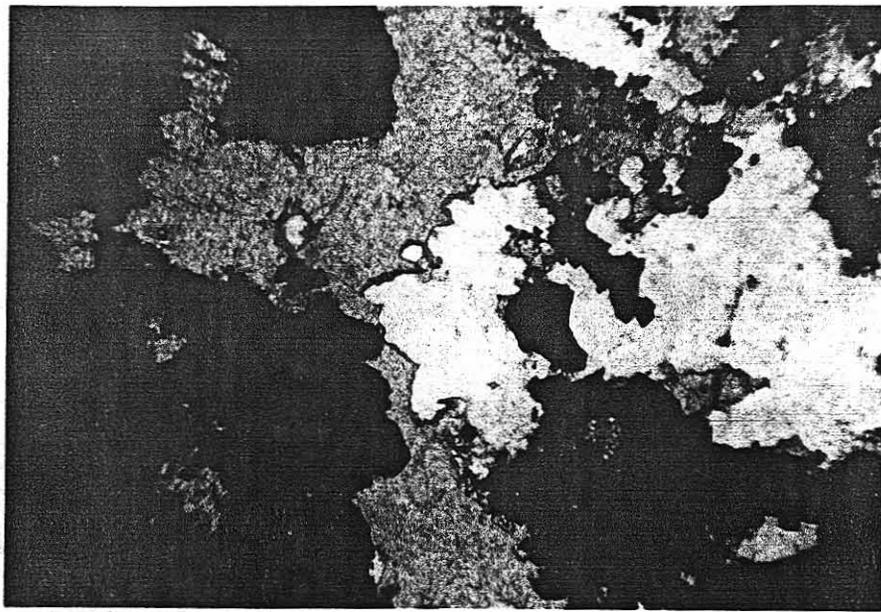
5 cm

PLATE 4 (Sample 603 described in report MP3634/74)

- a. Thin section showing carbonate (cloudy yellowish) and quartz (almost white) intergrown with opaque sulphide (black)

- b. Polished section of sample 603. Pyrite (yellow-coarse grained) with a vein-like mass containing small crystals of arsenopyrite (paler yellow than pyrite), some chalcopyrite (orange-yellow) and some sphalerite (purplish brown against chalcopyrite). The black is carbonate

- c. Polished section of sample 603. This is mainly a mass of intergrown crystals of arsenopyrite (paler yellow) with a little chalcopyrite (orange) and galena (pale grey) in some interstices. There are two grains of pyrite (P) which are slightly darker than the arsenopyrite

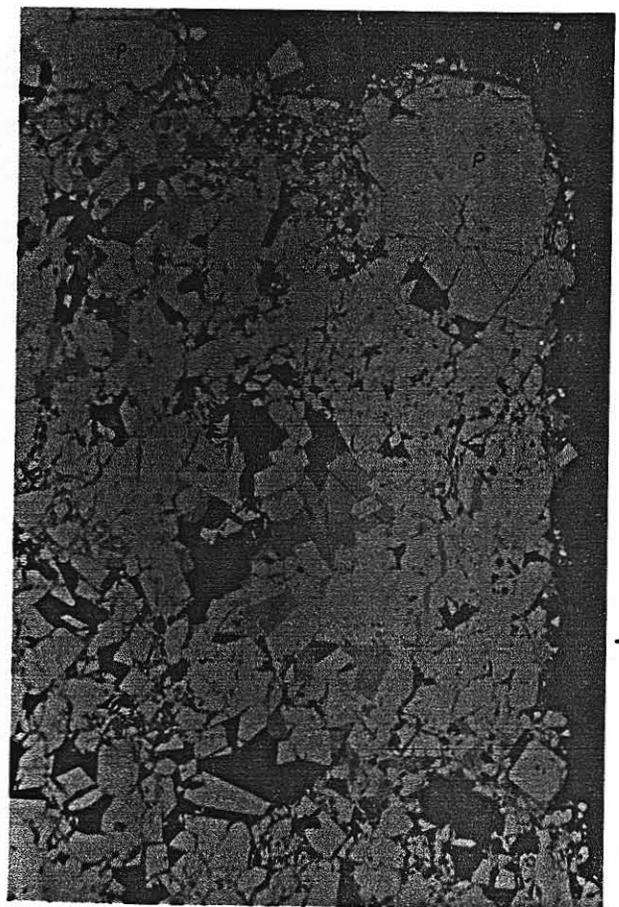


A.

1.0 mm.



0.1mm



C.

0.1mm

5 cm

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ome

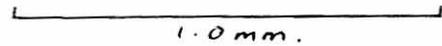
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PLATE 5 (Sample 609 described in Report MP3634/74)

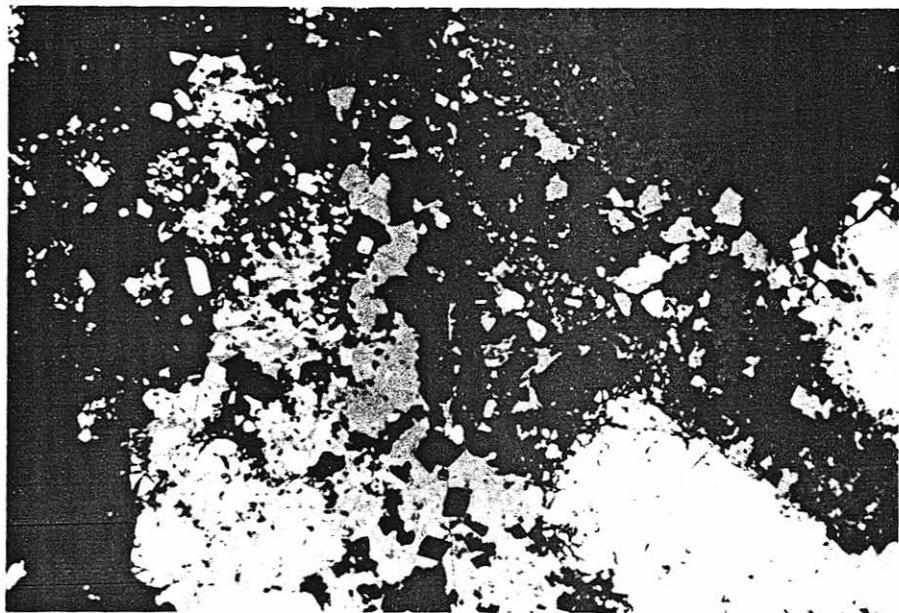
- a. Thin section of sample 609.
Sulphide - probably chalcopyrite
(black) fills some interstices
between carbonate crystals (pinkish
yellow)
- b. Polished section of sample 609
Pyrite (very pale yellow) has been
fractured and partly enclosed by
chalcopyrite (dark yellow). A little
sphalerite (greyish brown) occurs along
a vein. The dark is mainly carbonate



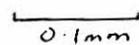
a.



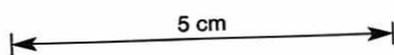
1.0 mm.



b.



0.1 mm



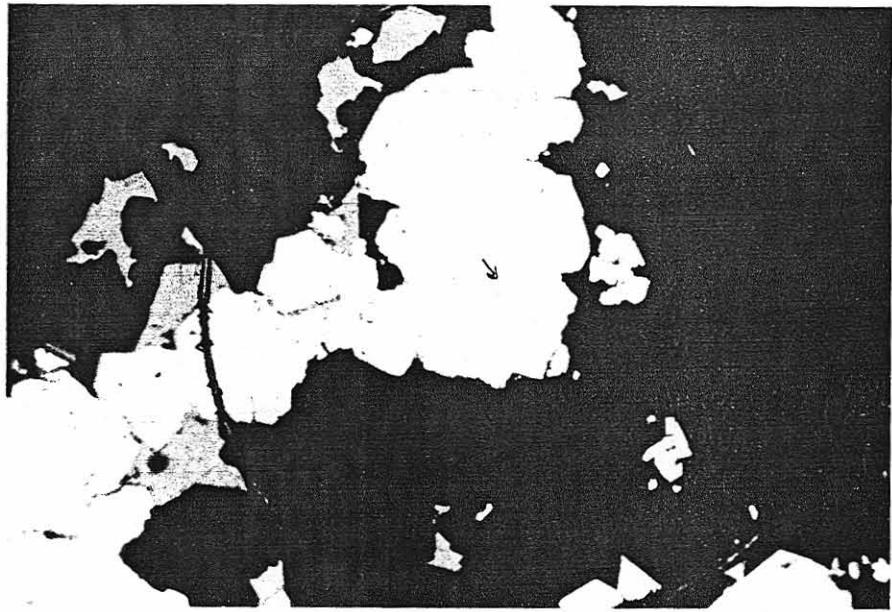
5 cm

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PLATE 6 (Sample 609 described in Report MP3634/74)

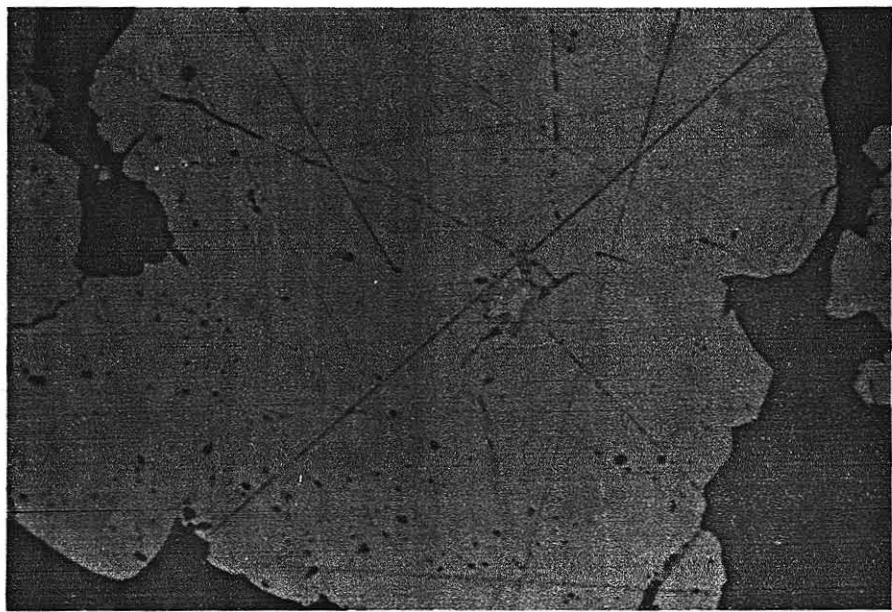
- a. Polished section of sample 609. Pyrite (pale yellow) with some chalcopyrite (darker yellow) and one inclusion of gold (arrow). The dark areas are carbonate
- b. Higher magnification of the gold particle in pyrite shown in fig (a). A trace of chalcopyrite is associated with the gold

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a.

0.1mm.



b.

0.1mm.

5 cm