57-190

RIO TINTO FIELD WORK

MURCHISON QUADRANGLE 51

Table of Contents VOL I – IV
Pieman 40 Chains 1956 on Murchison
Statement – Murchison – 20 Chains
Participating Geologists

30 CHAIN PHOTOS RUN 1, 2, 3

20 CHAIN PHOTOS RUN 1, 2

CCD

MURCHISON QUADRANGLE 51 PROGRESS SCHEDULE 446002

20 chains Brass Universal 1947

	RUN NO	PHOTO NO	OVERLAY FINISHED	OVERLAY CHECKED	FIELD NOTES PRINTED	FIELD NOTES TYPED	FIELD NOTES CHECKED		COMPILATION PRELIMINARY	COMPILATION CONTOUR MAP
VOL I	1	23755	✓	✓	✓	✓	✓			
		756	✓	✓		✓	✓			
		757	✓	✓		—	—			
		758	✓	✓		✓	✓			
		759	✓	✓		—	—			
		23761	✓	✓		—	—			
		762	✓	✓		—	—			
		764	✓	✓		✓	✓			
		767	✓	✓		✓	✓			
		769	✓	✓		✓	✓			
	2	26465	✓	✓		✓	✓			
		466	✓	✓		✓	✓			
		467	✓	✓		✓	✓			
		468	✓	✓		✓	✓			
		469	✓	✓		—	—			
		26470	✓	✓		✓	✓			
		471	✓	✓		—	—			
		472	✓	✓		✓	✓			
		473	✓	✓	✓	✓	✓			
		474	✓	✓		✓	✓			
VOL II	3	23833	✓	✓		✓	✓			
		834	✓	✓		✓	✓			
		835	✓	✓		✓	✓			
		836	✓	✓		✓	✓			
		837	✓	✓		✓	✓			
		838	✓	✓		—	—			
		839	✓	✓		—	—			
		23840	✓	✓		✓	✓			
		843	✓	✓		✓	✓			
		844	✓	✓	✓	✓	✓			
		845	✓	✓		✓	✓			

001

ARCHISON QUADRANGLE 51 Progress Schedule 446003

20 chains Brown & Duncan 1947

Run No	PHOTO NO	OVERLAY FINISHED	OVERLAY CHECKED	FIELD NOTES PRINTED	FIELD NOTES TYPED	FIELD NOTES CHECKED		COMPILATION PRELIMINARY	COMPILATION CONTOUR MAP
4	31059	✓	✓						
5	23871	✓			✓				✓
	872	✓			✓				✓
	873	✓			✓				✓
	874	✓	✓	✓					✓
	875	✓			✓?				✓
	876	✓			✓				✓
	877	✓	✓	✓					✓
	879 A	✓	✓	—	✓				✓
2	879 B	✓	✓	✓?					✓
	23880	✓	✓						✓
	881	✓	✓						✓
	882	✓	✓						✓
						NO RUN 6			
VOL III 7	23968	✓			✓				✓
	969	✓			✓				✓
	23970	✓			✓				✓
	971	✓			✓				✓
	972	✓	✓	✓					✓
	973	✓			✓				✓
	974	✓	✓	✓					✓
	975	✓	✓	✓					✓
	976	✓			✓				✓
	977	✓	✓	✓					✓
8	23978	✓	✓						✓
	979	✓	✓						✓
	23980	✓	✓	✓					✓
	981	✓	✓	✓					✓
	982	✓	✓						✓
	983	✓	✓	✓					✓
	984	✓	✓	✓					✓
	985	✓			✓				✓
	986	✓			✓				✓
	987	✓			✓				✓

002

MURCHISON QUADRANGLE 51 Progress Schedule 446004

20 chains Brown Edition 1947

	RUN NO	PHOTO NO	OVERLAY FINISHED	OVERLAY CHECKED	FIELD NOTES PRINTED	FIELD NOTES TYPED	FIELD NOTES CHECKED		COMPILATION PRELIMINARY	COMPILATION CONTOUR MAP
VOL IV	9	31154	✓	✓						✓
		155	✓	✓	✓					✓
		156	✓	✓	✓					✓
		157	✓	✓	✓					✓
		158	✓	✓	✓					✓
		159	✓	✓	✓					✓
		31160	✓	✓	✓					✓
		161	✓	✓						✓
		162	✓	✓	✓					✓
		165	✓	✓						✓
	WEST TIE	26052	✓	✓						✓
		054	✓	✓						✓
		056	✓	✓						✓
		~~058~~	~~+~~							✓
		053	✓	✓	✓					✓
	10	31170	✓	✓						✓
		171	✓	✓						✓
		172	✓	✓	✓					✓
		173	✓	✓	✓					✓
		174	✓	✓	✓					✓
		175	✓	✓						✓
		177	✓	✓						✓
		179	✓	✓						✓
	11	31267	✓	✓	✓					✓
		268	✓	✓	✓					✓
		31272	✓	✓						✓
		273	✓	✓						✓
	12	31282	✓	✓						✓
		284	✓	✓						✓
		286	✓	✓						✓

004

Pierson 40 chains 1956 on MURCHISON

Proper Schedule

446605

RUN NO	T-NO	PHOTO NO
6	T319	34
		34
		35
		35
		37
		39
7	T318	116
		119
		119
8	T318	81
		82
		83
		85
		85
9	T318	48
		50
		51
10	T324	19
10A	T316	8

005

Statement

MURCHISON 20 chains Brown & Dreaver 1947

446006

Run No.	Rio's Total	Taken for Tracing	No	Remarks
West Tie	26040-26069	26052, 4, 6, ~~8~~ 3.	4	
East Tie	2117-2077	——	0	
Run 1	23752-23799	23755, 6, 7, 8, 9		
		23761, 2, 4, 7, 9.	10	
Run 2	26462-26510	26465, 6, 7, 8, 9		
		26470, 1, 2, 3, 4	10	
Run 3	23800-23847	23833, 4, 5, 6, 7, 8, 9		
		23840, 3, 4, 5	11	
Run 4	31027-31061	31059	1	
Run 5	23871-23922	23871, 2, 3, 4, 5, 6, 7, 9, 9		
		23880, 1, 2.	12	
Run 6	——	——	—	New flown
Run 7	23923-23977	23968, 9		
		23970, 1, 2, 3, 4, 5, 6, 7.	10	
Run 8	23978-24024	23978, 9		
		23980, 1, 2, 3, 4, 5, 6, 7	10	
Run 9	31114-31169	31154, 5, 6, 7, 8, 9		
		31160, 1, 2, 5	10	
		~~Total~~	18	
Run 10	31170-31214	31170, 1, 2, 3, 4, 5, 7, 9	8	
Run 11	31220-31273	31267, 8		
		31272, 3	4	
Run 12	31274-31320	31282, 4, 6	3	
~~Duplicated Completed~~		Total	93	

30 chains Brown & Dreaver 1952

Run 1	42826-42845	42826, 7, 8	
		42830, 1	5
Run 2	42848-42872	42867, 8	
		42871	3
Run 3	-42897	42874	1
Run 4	42898-42922	——	0
		Total	9

78
15
93

Geologists Participating in Field work

006

Murchison 20 chains 1947

446007

A.B.C. — A. Bruno Campana

W.J.A. — Warren J. Atkinson

J.W.S. — J. Shields

D. K. — Don King

B. B. —

— G. Fish

57-190.

003

MURCHISON 30 chains Brown & Dunn 1952

Program Sheet

446608

	RUN NO	PHOTO NO	OVERLAY FINISHED	OVERLAY CHECKED	FIELD NOTES PRINTED	FIELD NOTES TYPED	FIELD NOTES CHECKED		COMPILATION PRELIMINARY	COMPILATION CONTOUR MAP
VOL I	1	42826.	✓	✓		✓	✓			
		827.	✓	✓		✓	✓			
		828 U/A				✓	✓			
		42830.	✓	✓		✓	✓			
		31.	✓	✓		✓	✓			
	2	42867 U/A								
		868.	✓	✓		✓	✓			
		42871.	✓	✓		✓	✓			
	3	42874	✓	✓		✓	✓			

007

MU REGION

QUAD 51

30 chrome Photos

Runs 1, 2, 3 (TOTAL) No Label

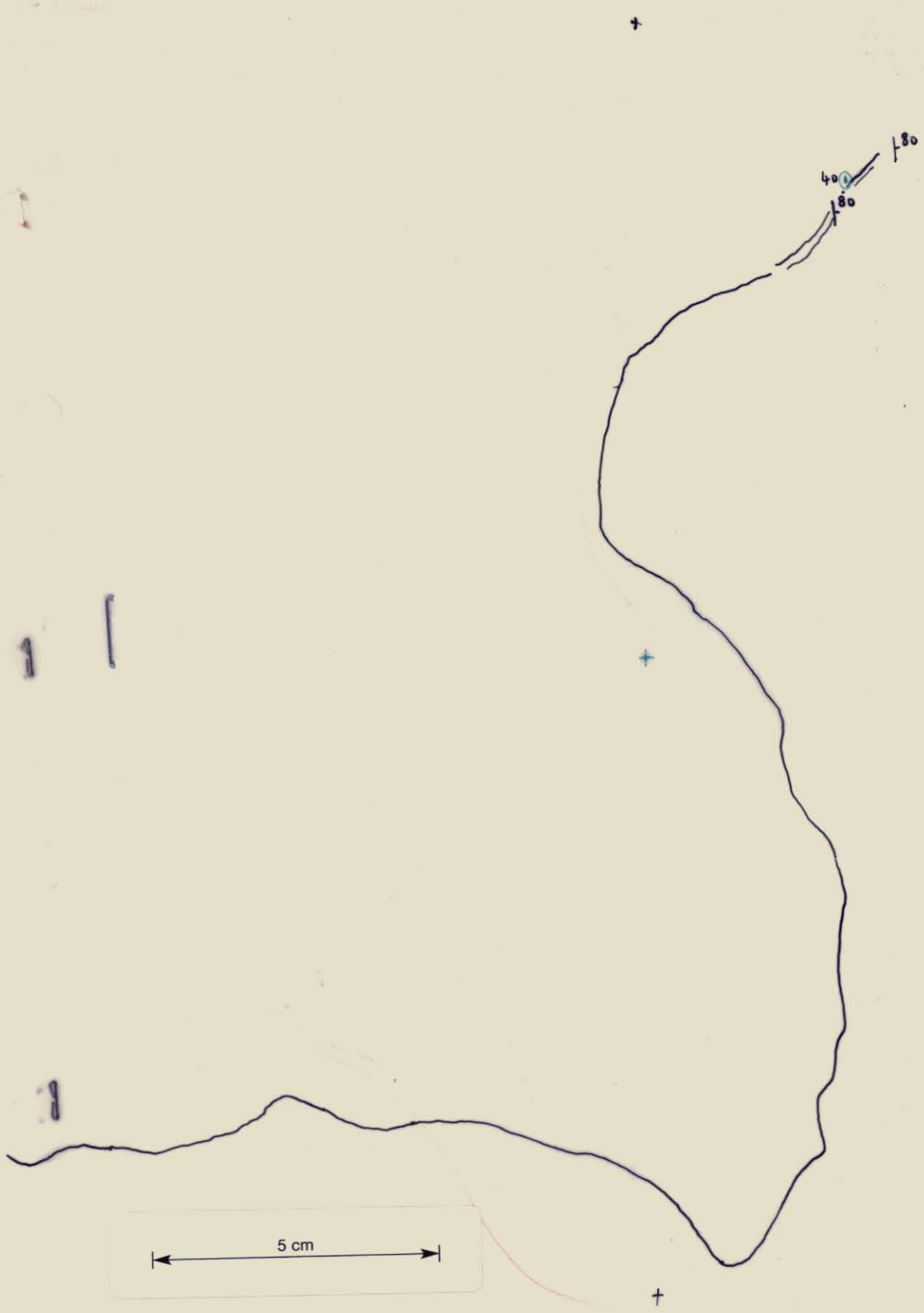
009

446009

MURCHISON RUN 1 42826 (30 chain)

1)Alternating green-grey rudely cleaved slates and medium grained greywacke conglomerate. Bedding in slates generally parallel to cleavage but local rolls indicate northerly pitch of 40°. Conglomerate has plentiful greenish matrix, pebbles of volcanic mater: material and pink & grey rounded quartz & quartzite pebbles up to 1½" diameter. Is the Razorback-type conglom erate.?

M.Solomon



008

1)Massive pyroclastics;creamy or grey felspar or quartz felspar rock. Locally chloritic.
2)Miners Slates;grey finely banded siltstones and slates with thin conglomeratic bands containing rounded pebbles of Dundas rock and quartz
3)Pale grey & purplish shales
4)Well bedded medium grained sandstones,locally alternating with slates. Locally felspathic and containing dark grains. Generally pale grey.
5)Slatey sandstones,fine tuffaceous sandstones and typical Miners slates.
6)Massive pyroclastics;blocky felspar rock.

MURCHISON : RUN 1. : 42827

MUR HISON run 1 42830 M Solomon 446011

013

1)On lower slopes:pink felspar porphyry with sparse ferromag.and some alteration of felspar to chlorite;weathering to white rock showing up isolated quartz phenocrysts.
2)Hornfelsed slatey rocks;crumpled,vague bedding.
3)Massive grey qfp laced with quartz veins.
4)Augite basalts(?)like battery volcanics,Queenstown.
5)Grey-green qfp,some ferromag.(chloritised)&abundant felspar phenocrysts. Suggestions of fluxion banding;light cleavage. Quartz veining common.

012

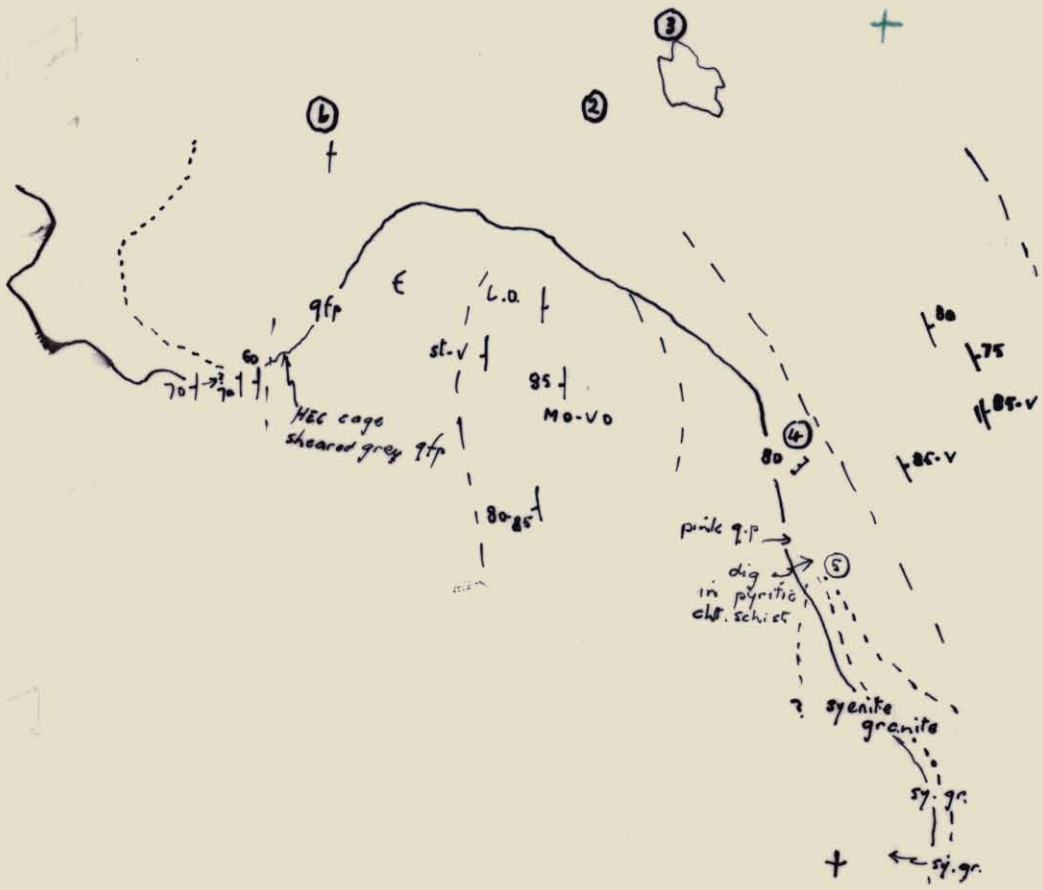
MURCHISON : RUN (1): 42830

MURCHISON Run 1 42831 M Solomon 446012

015

1)Sheared quartz felspar porphyry with local haematisation.
Within 70 feet of Owen Cong. mainly coarse quartz schist.
No evidence of Jukes conglomerate.
2)Sandy shales and alternating shale and sandstone;if visible cleavage is axial plane type,suggests axes dip west about 60°
3)Upper Owen red-brown sandstone,part tubicolar-like,alternating with medium conglomerate.Close folding,wavelength 100 feet,
Structure across Murchison Gorge is a north-pitching anticline.
Owen thickness 1000 feet(?)
4)Alternation of pale sericitic schist and green chlorite and quartz chl rite schist.
5)Variable pink granite-syenite,coarse to fine grained,mainly pink felspar and chlorite,with or without biotite and quartz.
Locally sheared;chloritisation and pyritisation visible.
6)Tuff,shaley beds,and qfp.

5 cm



MURCHISON : RUN (1) 42831

014

MURCHISON 2 – 42468

446013

MURCHISON : RUN 2 42468

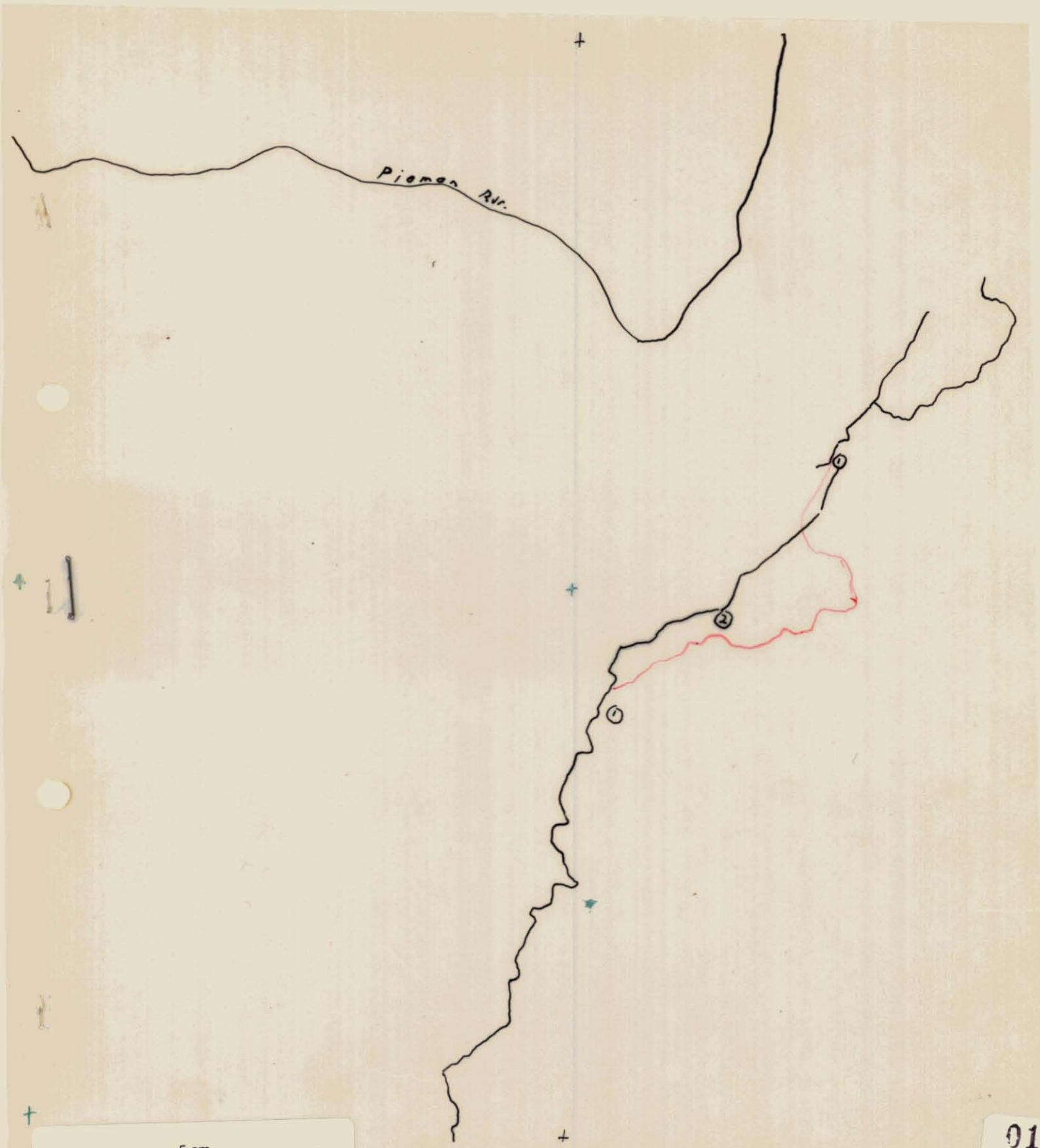
016

MURCHISON run 2 42868 M Solomon 446014

017 1)Massive,blocky,generally blue or green grey in colour,felspar porph ry. Locally loaded with inclusions(siltstone,porphyry) to give fragmental appearance. No acid lavas with free quartz observed;mainly keratophyres,andesites,possibly basalts.

MURCHISON 2 — 42871

446015



018

↑ MURCHISON : RUN (2) 42871

MUR HISON RUN 2 42871

1)Quartz schists: stressed pyroclastics(?)

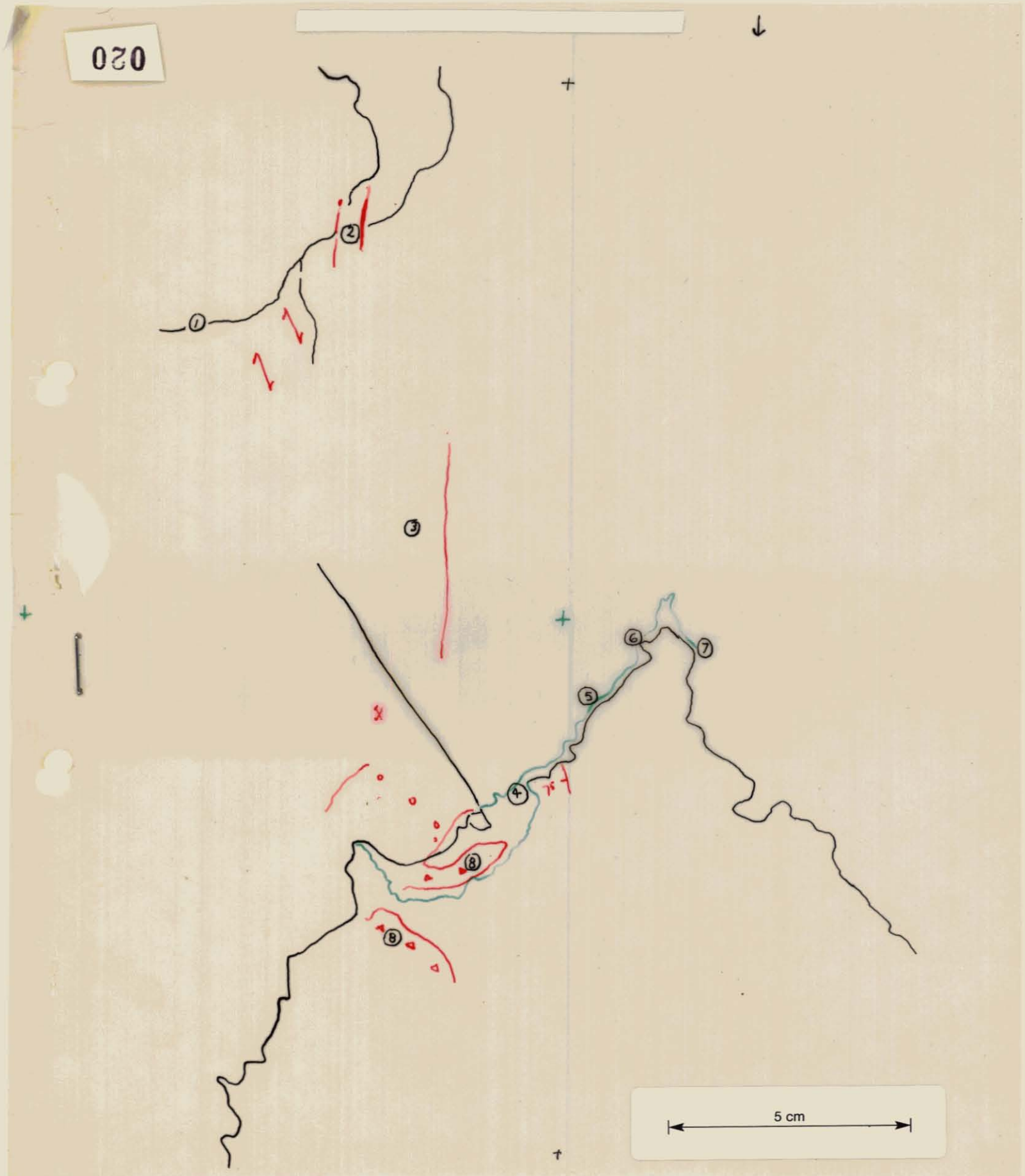
2)Glacial blanket: Coarse morainic material with abundant "Owen conglomerate" erratics

(not Solomon--Atkinson?)
B.Campana & B.Fraser 8-9/1/58

MURCHISON RUN 3 — 42874

446017

020



021

MUR HISON RUN 3 42874

446018

B.Campana and B.Fraser 8-9/1/58

1)"Massive pyroclastics":quartz-porphyries and felsite
partly massive,partly stressed and sc
schistose

2)dark laminated slates:mineralised in the Hercules Mine
~~[illegible]~~

3)"Quartz-schists:stressed pyroclastics and lavas

4)dark blue,poorly bedded skates

5)tuffs

6)slates

7)tuffs and slates of the Dundas group

8)Morainic drift,with abundant Owen conglomerate erratics

M.Solomon(note on photo) "Aren't these Permian?"
Refers to either item 2,4,or both.

CGD

MURCHISON QUADRANGLE 51 PROGRESS SCHEDULE

20 chains Drawn & Duncan 1947

	RUN No	PHOTO No	OVERLAY FINISHED	OVERLAY CHECKED	FIELD NOTES PRINTED	FIELD NOTES TYPED	FIELD NOTES CHECKED		COMPILATION PRELIMINARY	COMPILATION CONTOUR MA
VOL I	1	23755	✓	✓	✓	✓	✓			
		756	✓	✓		✓	✓			
		757	✓	✓		—	—			
		758	✓	✓		✓	✓			
		759	✓	✓		—	—			
		23761	✓	✓		—	—			
		762	✓	✓		—	—			
		764	✓	✓		✓	✓			
		767	✓	✓		✓	✓			
		769	✓	✓		✓	✓			
	2	26465	✓	✓		✓	✓			
		466	✓	✓		✓	✓			
		467	✓	✓		✓	✓			
		468	✓	✓		✓	✓			
		469	✓	✓		—	—			
		26470	✓	✓		✓	✓			
		471	✓	✓		—	—			
		472	✓	✓		✓	✓			
		473	✓	✓	✓	✓	✓			
		474	✓	✓		✓	✓			

022

MURCHISON

446020

QUAD 51

20 CHAIN PLOTS

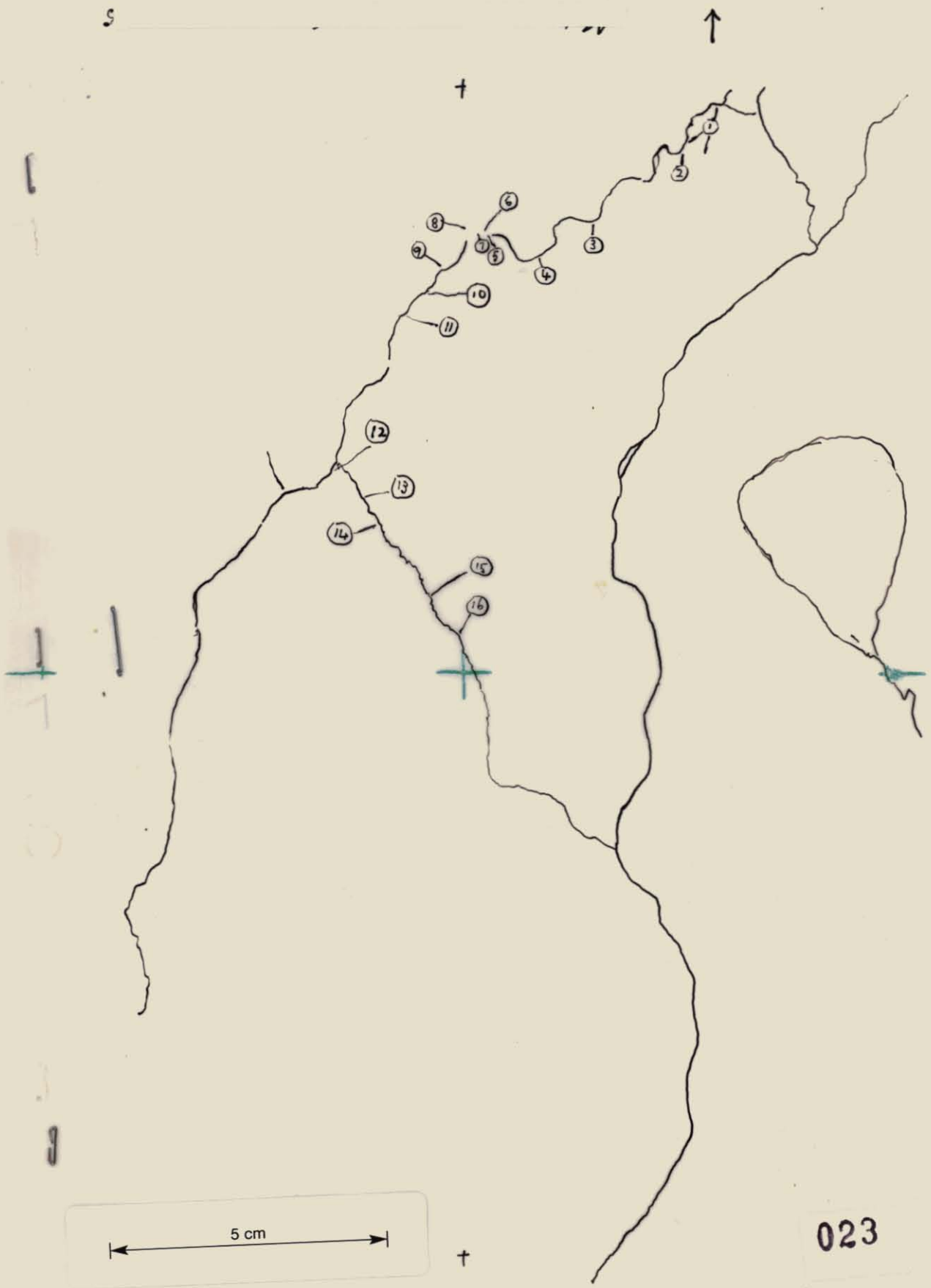
Runs 1 & 2 This Folder

3, 4, 5,
6, 7, 8
9, 10, 11, 12, last Tie

} Other Folders

MURCHISON 1— 23755

446021



023

MURCHISON ~~Mss~~ 1 – 23755

024

44C022

G. Fish 23/2/59

(1) Interbedded dark blue-grey fine grained ss or quartzite & a dark blue pyroclastic Strike 350/vert.

(2) Interbedded feldspathic shale, slate & quartzite Strike 350/67°E

(3) a grey quartzite containing sub rounded grains of quartz, flakes of biotite, & minor flakes of muscovite Strike 350/70°E

(4) a very siliceous grey rock somewhat similar to (1). In places it resembles a quartzite – in others a porphyry. (Specimen) There is a linear direction Bedding? 340°/70°E

(5) a grey-green banded chert interbedded with (4) Strike 330/62°E

(6) Same as (4) but more massive & containing disseminated grains of pyrrhotite. The rock looks igneous – it may be a siliceous quartz porphyry

(7) Fine grained grey quartzite containing occasional white coloured bands along the bedding plane. Strike 360/60°E. also interbedded is a siliceous porphyry containing fragments of slate. One specimen – rounded spherical slate pebble 6" x 2".

(8) Similar grey quartzite to (7)

(9) Quartzite 345/62°E interbedded with a siliceous black shale Cleavage direction 325/steep W.

(10) Blue extremely siliceous quartz porphyry containing crystals of glassy quartz, flakes of biotite & grains of pyrrhotite.

(11) Green siliceous pyroclastic probably a tuffaceous member lineation 340°/West interbedded with a rock similar to (6)

(12) Grey quartzite 23755 lineation 345° interbedded with (4)
Bedding 340°/66°E

(13) Grey chert or quartzite interbedded with a grey-green quartzite Strike 330/60°E. The rock is very gently folded – drag folds?

(14) Banded pale grey-black fine grained chert Strike 330/65°E.

(15) Same chert 330/60°E

(16) Banded chert interbedded with a quartzite 320/65°E.

Murchison Run 1/23755.

025

MURCHISON run 1 23755 Graeme Fish 23/2/59

1)Interbedded dark blue-grey fine grained sstone or quartzite and a dark blue pyroclastic.Strike 350/vertical.
2)Interbedded fàlspathic shale,slate and quartzite.Strike 350/67E.
3)A grey quartzite containing sub-rounded grains of quartz,flakes of biotite,and minor flakes of muscovite.Strike 350/70E
4)A very siliceous grey rock somewhat similar to (3). In places it resembles a quartzite--in others a porphyry(specimen).There is a linear direction. Bedding? 340/70E
5)A grey green banded chert,interbedded with (4).Strike 330/52E
6)Same as (4) but more massive and containing disseminated grains of pyrrhotite. The rock looks igneous--it may be a siliceous quartz porphyry.
7)Fine grained grey quartzite containing occasional white coloured bands along the bedding plane.Strike 360/60E.Also interbedded as a siliceous porphyry containing fragments of slate. One specimen--rounded spherical slate pebble 6" by 2".
8)Similar grey quartzite to (7)
9)Quartzite 345/62E interbedded with a siliceous black shale cleavage direction 325/steep West
10)Blue extremely siliceous quartz porphyry containing crystals of glassy quartz,flakes of biotite and grains of pyrrhotite.
11)Green siliceous pyroclastic probably a tuffaceous member lineation 340/west interbedded with a rock similar to (4)
12)Grey quartzite lineation 345 interbedded with (4)Bedding 340/66E
13)Grey chert or quartzite interbedded with a grey-green quartzite strike 330/60E The rock is very gently folded--drag folds?
14)Banded pale grey-black fine grained chert strike 330/65E
15)Same chert 330/60E
16)Banded chert interbedded with a quartzite 32o/65E

026

MURCHISON Run 1 23756

446024

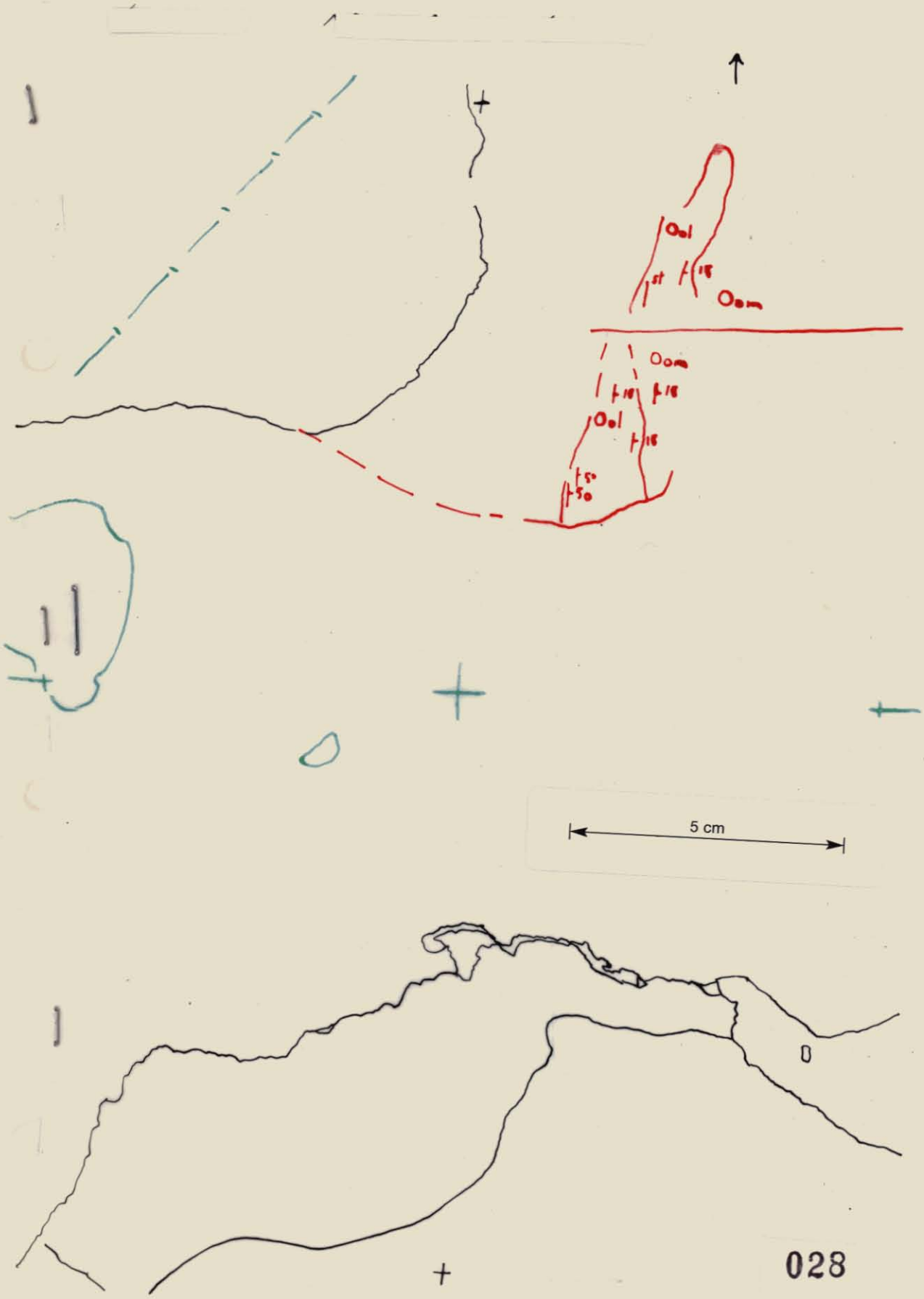
1)Massive,dark green,porph roid:specimen(1)
2)Boulder moraines

MURCHISON I— 23756

446025

MURCHISON 1-23757

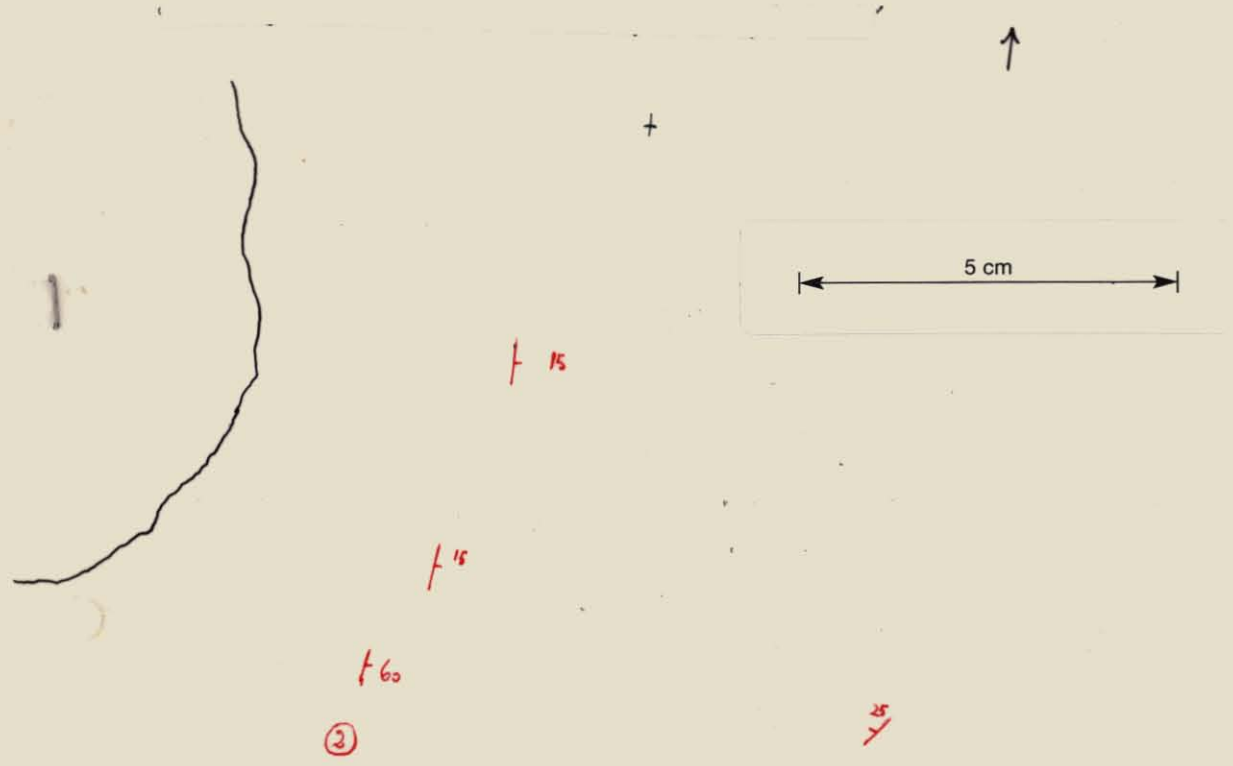
446026

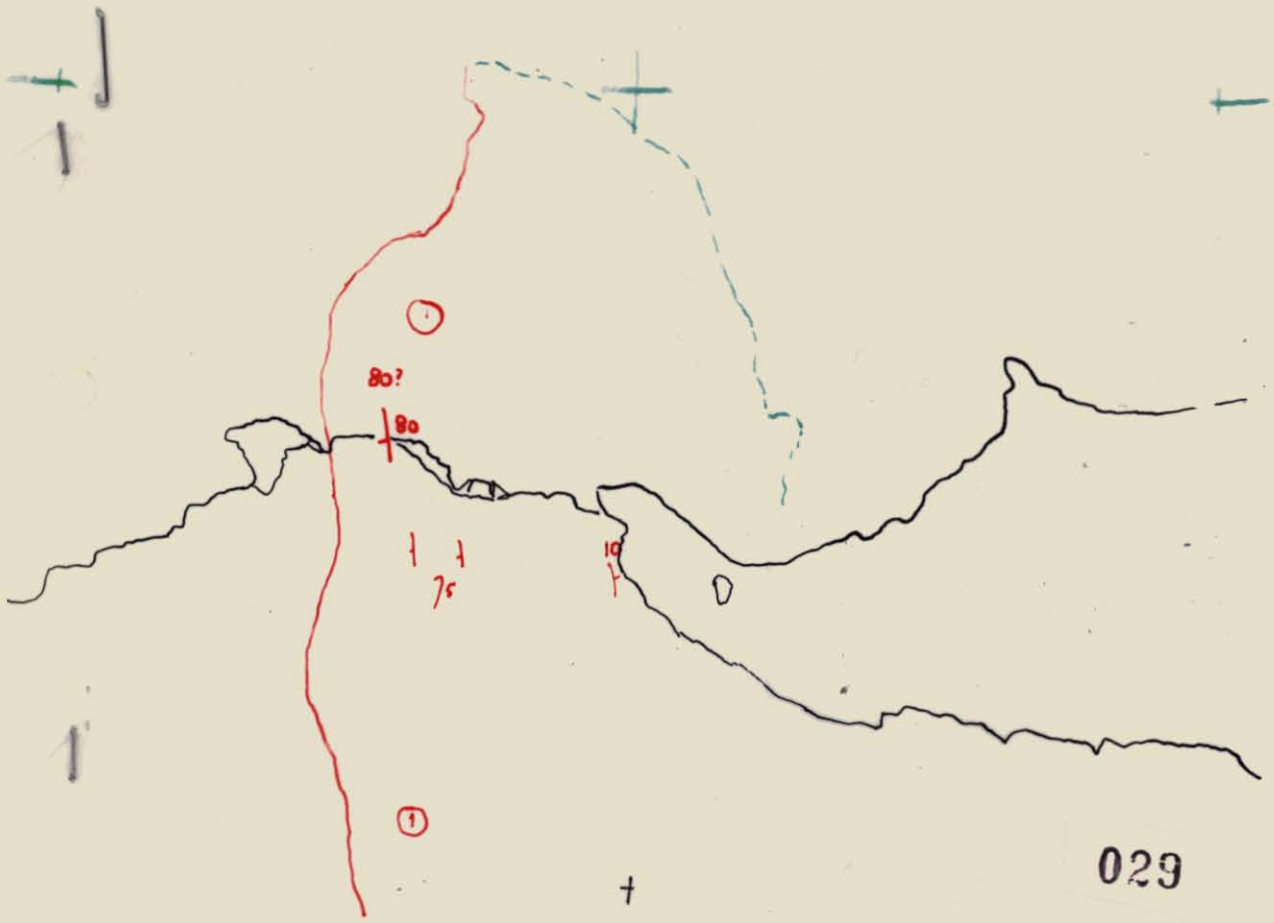


028

MURCHISON 1-23758

446627





029

MURCHISON Run 1 23758

030 1)Owen conglomerate

2)Glacial

446028

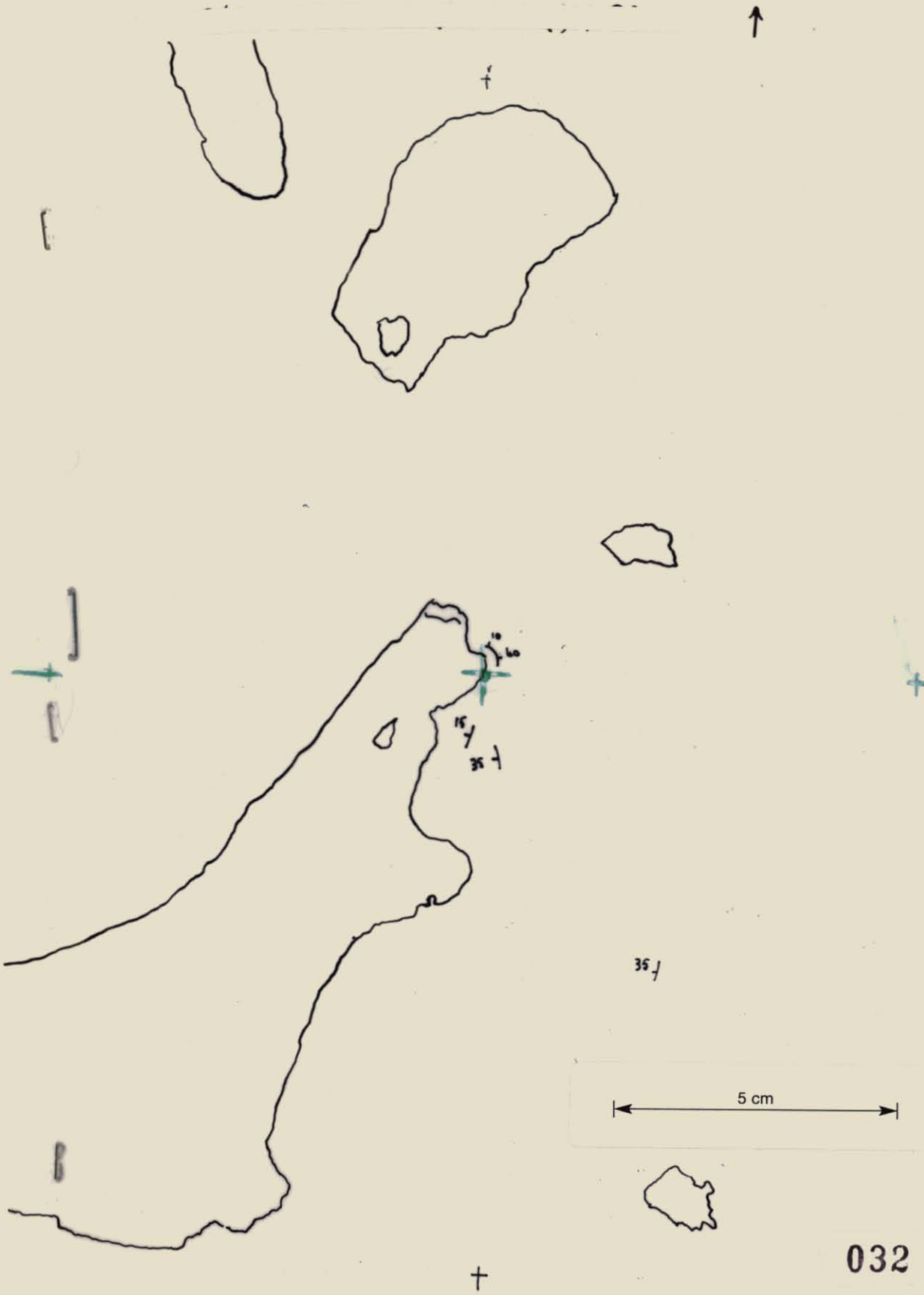
MURCHISON 1—23759

446028

031

MURCHISON I-23761

446630



032

MURCHISON 1—23762

446031

035

MURCHISON Run 1 23764 M Solomon 446032

1)Red pebbly sandstone and conglomerate
2)greywacke quartzites and fine conglomerate--tupical upper Owen.
Middle Owen thin if present.

037

MURCHISON Run 1 23767 R.B.F.March '58

1)Jukes
2)Owen(undif)

446033

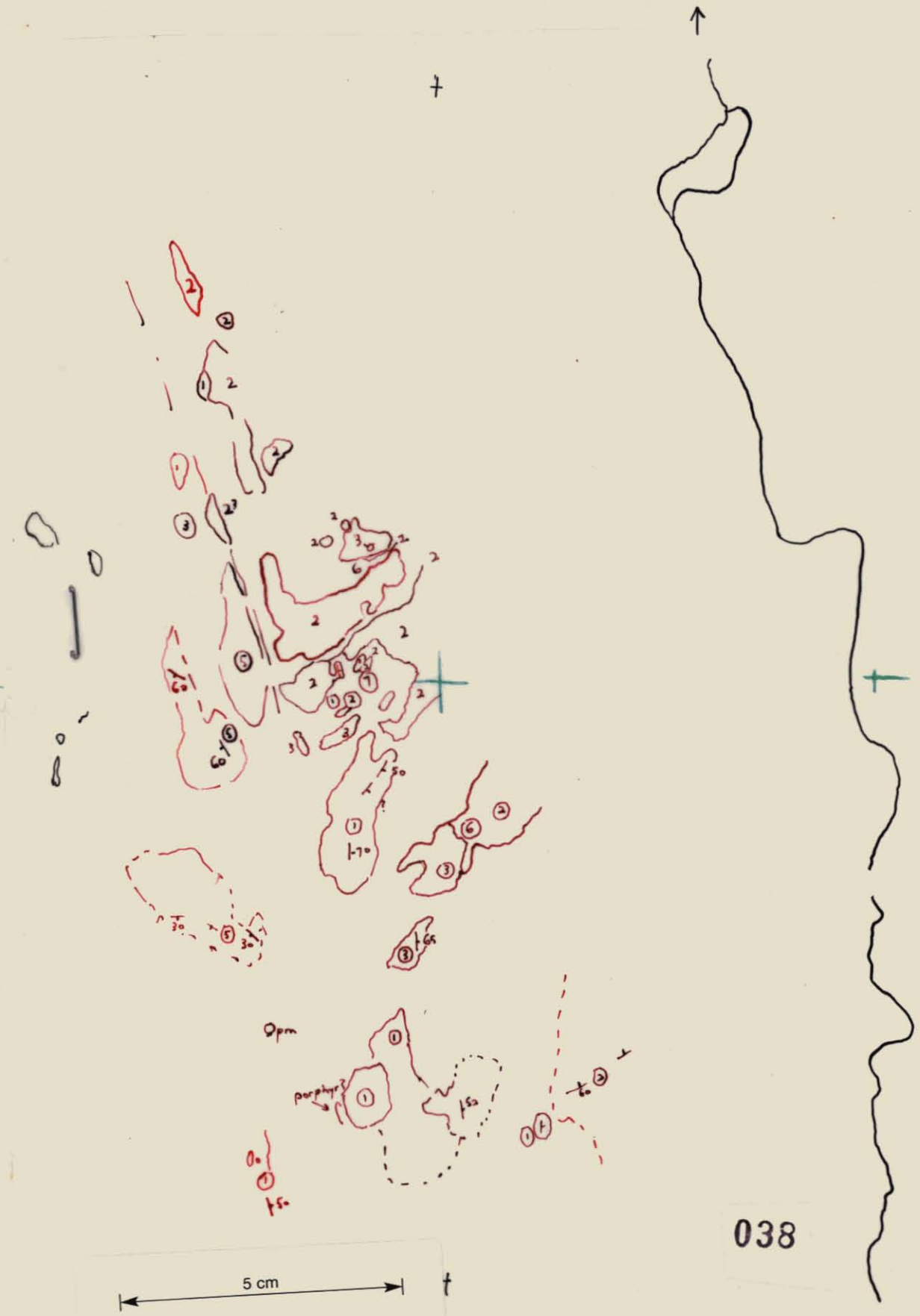
036

039

MURCHISON Run 1 23769 R.B.F. Feb-Mar '58 446034

1)Thinly bedded red-brown quartzites and granule and pebble conglomerates.Fragments are quartzite or fault-quartz. white,pink
2)Precambrian quartzites
3)Very coarse(up to 3 feet diam)conglomerate-breccia,talus,basal. Matrix sparse,haematite in places.Influence of jointing still dominating shape of boulders.Little transport. Mostly white quartz and quartzite(PC)fragments.Unconformity well exposed in several places.--Owen on PC Possibly some post-consolidation tectonism.
5)Flaggy grey quartzites,impure. Some approaching greywacke. Owen.Some argillite bands.
6)Points where Owen unconformity well shown.
7)In this general area,thin owen outliers(red brown quartzites,thin interbedded granule to cobble conglomerates)on Precambeian qzites.

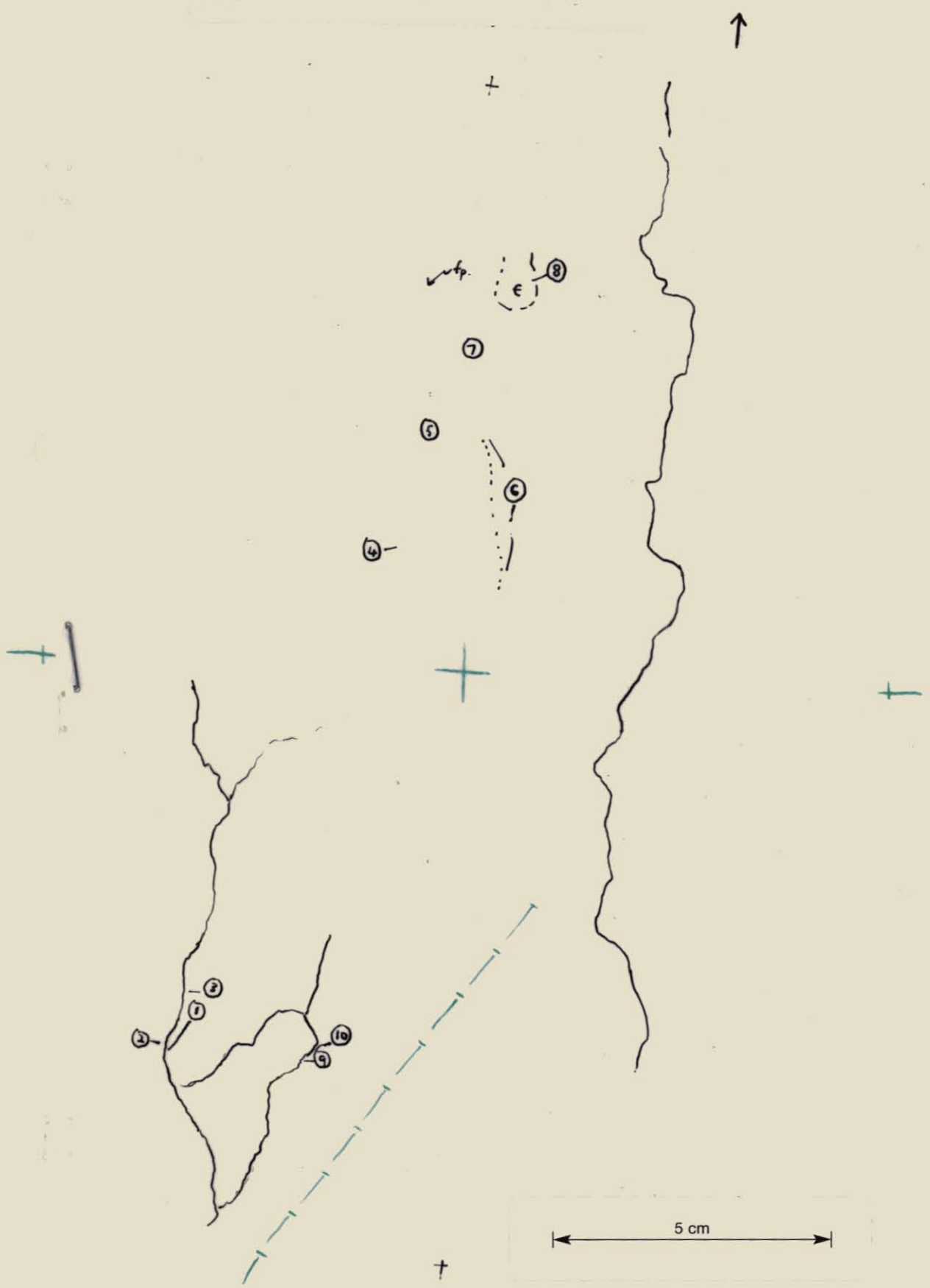
Symbol U --unconformity exposed(basal Owen breccia on PC qzites)



038

HURCHISON 2—26465

RUN NO 2



446036

041

MURCHISON Run 2 26465 G Fish 22/2/59

1)Massive grey quartzite--very fine grains of quartz--massively bedded.
2)Same rock interbedded with a fine grained banded grey fairly siliceous slate. Strike 360/68E
3)A grey-fawn fine grained sstone containing mainly quartz,felspar with occasional flakes of muscovite.It strikes 360/75E
It is interbedded with the shale(2)
4)A green fairly siliceous rock containing large phenocrysts of hornblende?,plates of biotite,felspar,pyrite and pyrrhotite, in fine grained siliceous and felspathic matrix-$\frac{2}{4}$hornblende(?) porphyry---in situ?
5)and 6)Similar type of rock definitely in place.--finer grained ground mass but phenocrysts of hornblende are of the order of 5mm in diameter.
7)Siliceous pyroclastic --lava? Sheared green in colour,lineation 340
8)Green siliceous pyroclastic--lineation 360/vert

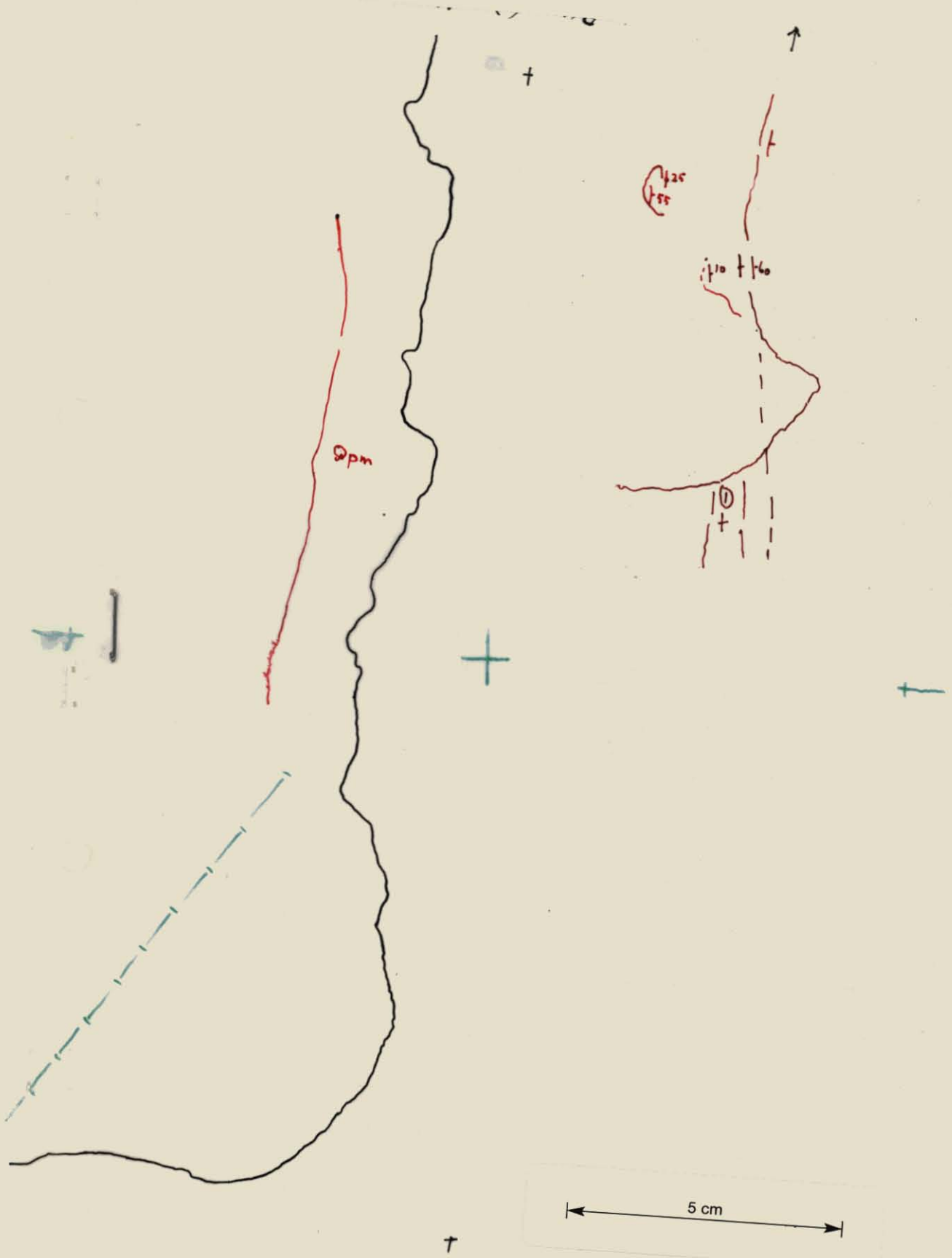
G Fish 27/2/59

9)Blue felspathic shale fine grained strike 355/70E
10)Green felspathic very weathered pyroclastic--lava? same as (27) and (28) in photo 3-23844. Lineation 360/65E
This may be a bedded tuff as the strke follows the regional sedimentary bedding direction.

MURCHISON 2 — 2646

042

446037



1)Coarse conglomerate

MURCHISON 2 – 26467

044

446039

045

MURCHISON Run 2 26467 M Solomon

446040

1)Up to 300 feet of dark purplish fine-medium conglomerate-breccia with plentiful dark ferruginoous matrix,interbedded with reddish sa sandstone. Probably Upper Owen.

MURCHISON 2 — 26468

046

446041

MURCHISON 2-26469

047

446042

MURCHISON 2 — 26470

048

446043

MUR HISON Run 2 26470 M Solomon

446044

1)Glaciated pavements on Lower Owen conglomerate
2)Loose hematite fragments
3)About 500 feet of purplish pebbly quartzite,fine conglomerate, and pink & grey quartzites. Rather shaley at base (however Owen)wit hematite lenses. Lowe Owen greater than 500 feet,less than 1000 ft thick
4)Medium to fine dark conglomerates with thin sandstones. Typical Middle Owen.

MURCHISON 2 – 26471

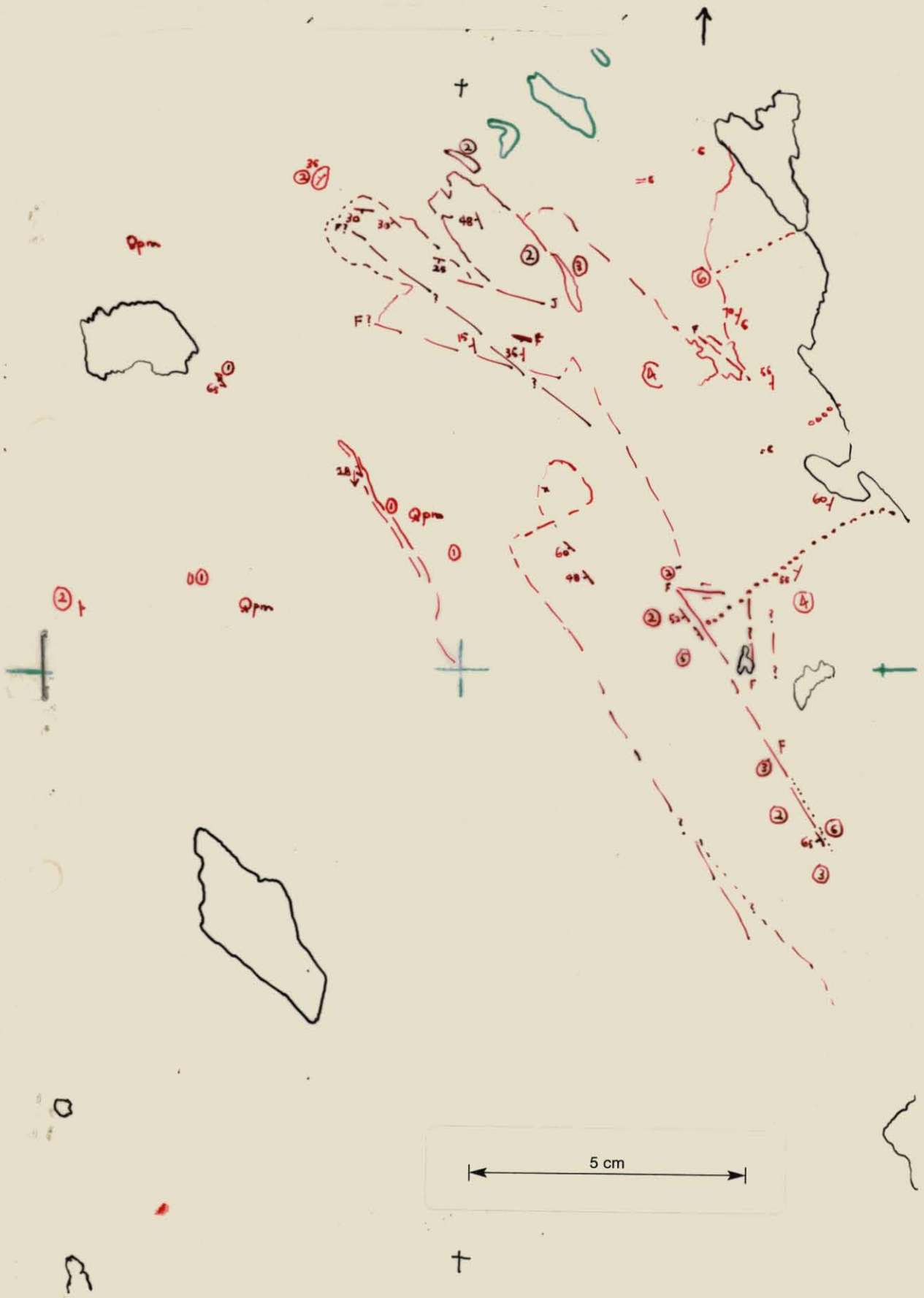
050

446045

MURCHISON 2 — 26472

051

446046



446047

052 MURCHISON Run 2 26472 R.B.F. 26/2/58

Symbols U:unconformity ~~X~~ ~~K~~ = c :costean

ooo Conglomerate Ø Cambrian porphyry,possibly some sedimentary bands,some included fragments.

1)Gordon limestone,gently folded
2)Owen(sandstone and conglomerate) Red brown and white qzites and granule and pebble conglomerates,about 700 feet true thickness
3)Purple,generally cobble sized breccia conglomerate,cobbles of pink and white quartz,porphyries,chlorite schist.Matrix same material. Occurs as thin(5'-20')band immediately below Owen sandstone, locally unconformably with Owen and Dora conglomerate below it abd sometimes apparently gradational with both as at (6). Equivalent to Jukes?
4)Conglomerate--"Dora Conglomerate"--very coarse(up to 3' diameter) Conglomerate boulders mainly porphyry,some quartzites Schist partixles
5)20 feet Jukes(?),80 feet red qzites and pebble conglomerate, 300 feet wh ite quartz veined qzites. Horizontal thickness

MURCHISON 2 — 26473

053

446048

↓ RUN (2) MURCHISON 26473

MURCHISON 2 - 26473

054

446049

17/4/57. ABC

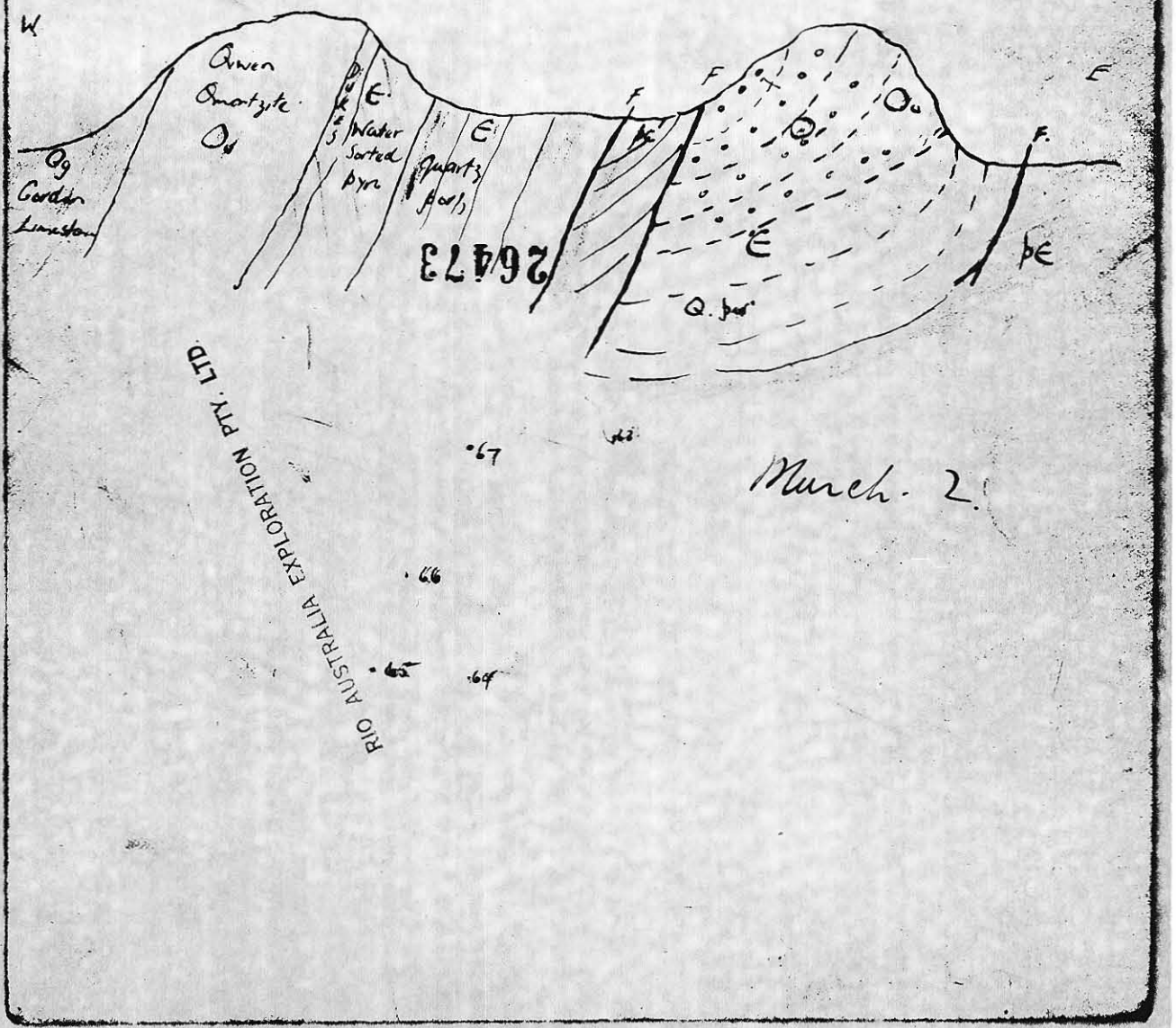
63 Owen Qtz 130°/65°W.

64 Dukes Breccia 145/70°W

65 Massive Quartzite pE-Carbine 135/60°W. — Unconformity - faulted.

66 Contorted quadzites pE- 155°/60°W.

67 Green chloritised schist with chert fragments - pellet like.



RIO AUSTRALIA EXPLORATION PTY. LTD.

Murch. 2.

MURCHISON Run 2 26473 A.B.C. 17/4/57

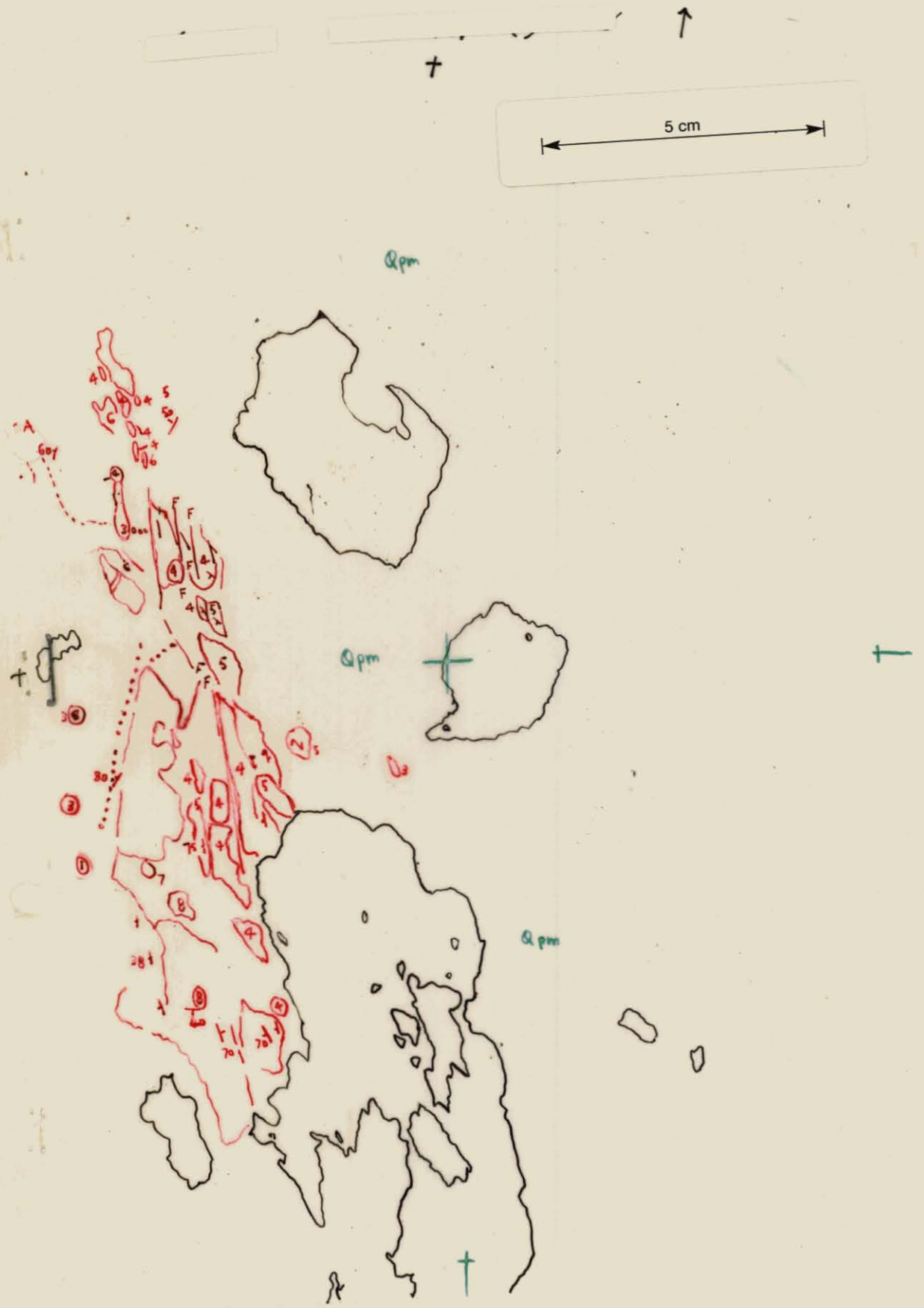
63) Owen qzite 130/65W
64) Jukes breccia 145/70W
65) Massive qzite PreCambriah --Carbine 135/60W--Unconformity--faulted
66) Contorted qzites PreC-- 155/60W
67) Green chloritic schist with chert fragments--pellet like.

(plus section)

MURCHISON 2— 26474

056

446051



057 MURCHISON Run 2 26474 R.B.F. Feb-Mar 1958 446052

Symbols: C.S.Chlorite schist = c :costean A:adit

1)Brown red-white qzites interbedded with bands granule conglomerate and breccia.Some pebbles--Owen
2?)Slaty cleavage in some of the argillaceous members,evidently in Owen,down faulted into Cambrian in places.Minor carbonaceous bands in some of the 'slaty' types.
3)Dora conglomerate
4)Fault zone in qzites and schists,severe tectonic brecciation. both edges fairly well delimited.
5)Grey and white qzites, quartz veined.Small diverse faulting.Strongly jointed,minor bands white qzite.pebble breccia. Minoe argillaceous bands.Apparently similar to material in fault zones,but less tectonism.
6)porphyry(conglomerate and finer sedimentary bands undifferentiated) Some qzite and qtz-chlorite schists
7)to be inspected further
8)Conglomerate,apparently stratigraphically higher than Jukes,some pink sandstone bands.

57-190

RIO TINTO FIELD WORK

MURCHISON QUADRANGLE 51

Table of Contents - Vol II

20 CHAIN PHOTOS RUNS 3, 4, 5

446054

ENGROSSED

VOL II	3	23833.	✓	✓		✓	✓			
		834.	✓	✓		✓	✓			
		835.	✓	✓		✓	✓			
		836.	✓	✓		✓	✓			
		837.	✓	✓		✓	✓			
		838.	✓	✓		—	—			
		839.	✓	✓		—	—			
		23840.	✓	✓		✓	✓			
		843.	✓	✓		✓	✓			
		844.	✓	✓	✓	✓	✓			
		845.	✓	✓		✓	✓			

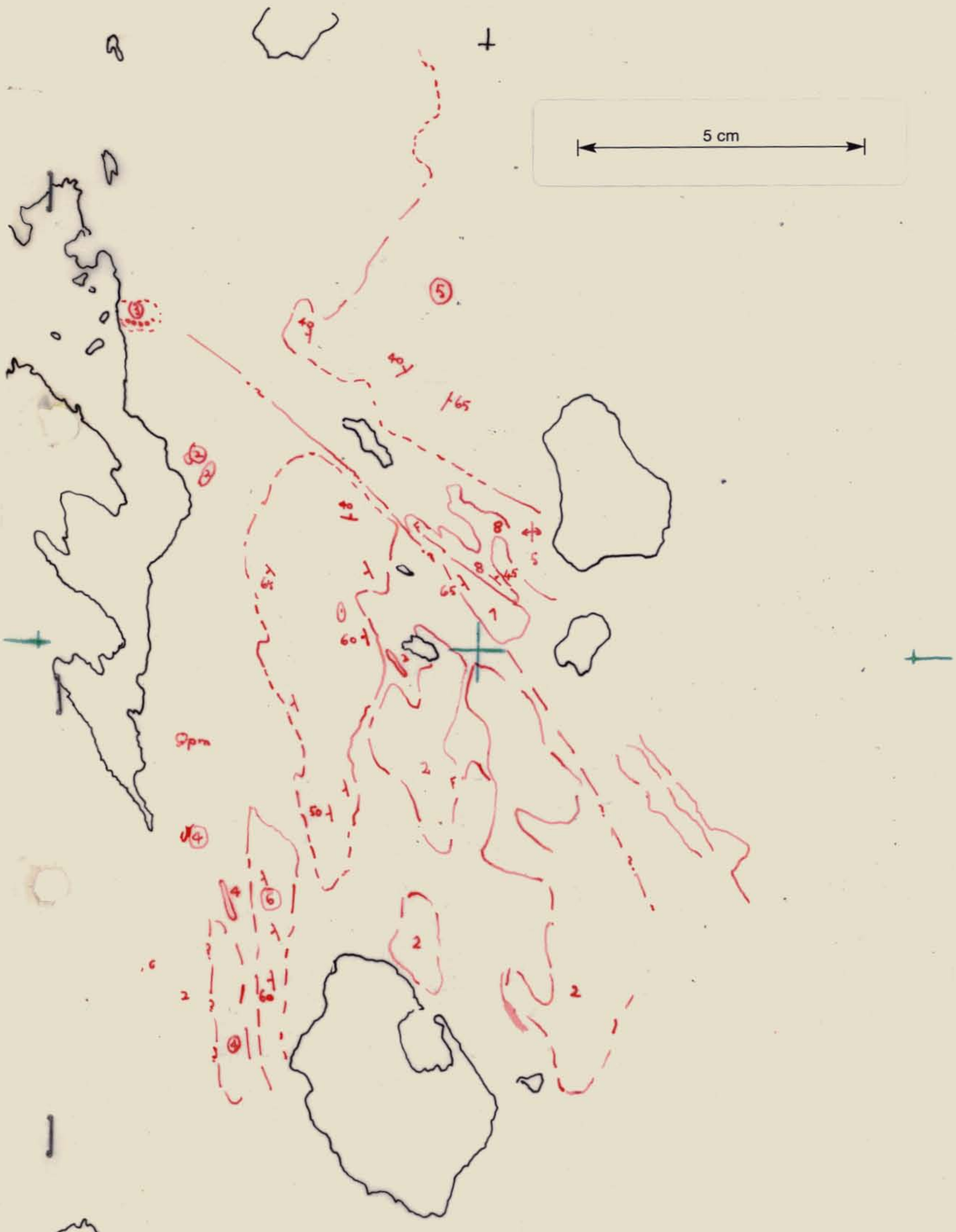
	Run No	Photo No	FINISHED	CHECKED	PRINTED	TYPED	CHECKED		PRELIMINARY	CONTOUR MA
	4	31059.	✓	✓						
	5	23871.	✓			✓				✓
		872.	✓			✓				✓
		873.	✓			✓				✓
		874.	✓	✓	✓					✓
		875.	✓			✓				✓
		876.	✓			✓				✓
		877.	✓	✓	✓					✓
		879 A.	✓	✓	—	✓				✓
		879 B.	✓	✓	✓					✓
		23880.	✓	✓						✓
		881.	✓	✓						✓
		882.	✓	✓						✓

WO RUN 6

MURCHISON 3 — 23833

000

446055



↑ RUN (3) MURCHISON 23833

001

MURCHISON run 3 23833 R.B.F. Feb '58 446056

1)Owen qzites,brown and white,granule and pebble conglomerates. No Jukes seen.Apparently unconformable on (2)
2)Porphyries,some sedimentary fragments,some shearing.Some chlorite schist.One occurrence of minor pyrite seen.--Cambrian
3)Dora conglomerate. See Murchison Run 2--26472
4)Sheared qzites,tectonically brecciated.Much qtz veining.Some s sheared fine chlorite-sericite schist with slaty cleavage. occurs in fault zone
5)PreC qzites,whi e to grey,some hematite staining,fine,recrystallised,fluted,cleaved(giving thin flakes),forms hill,tightly folded much quartz,asymmetrically ripple marked.
6)Mainly white and grey qzites,s me flaggy,heavily jointed,qz veined S Some more argillaceous members as fine chlorite schist with slaty cleavage. Near e st edge of strong tectonic zone.Evidently either intercalating in Cambrian section,ot in Owen--more likely in the Owen outlier.
7)White and red brown qzites,thin bedded,some argillaceous bands and white quartz granule and cobble conglomerate.
8)Very coarse boulder breccia(talus)basal Owen resting on PreC qzite

Symbols: U:Apparent unconformity
=c:costean
A:adit

C02 MUR HISON Run 3 23834 A.B.C. 16/4/57 446057

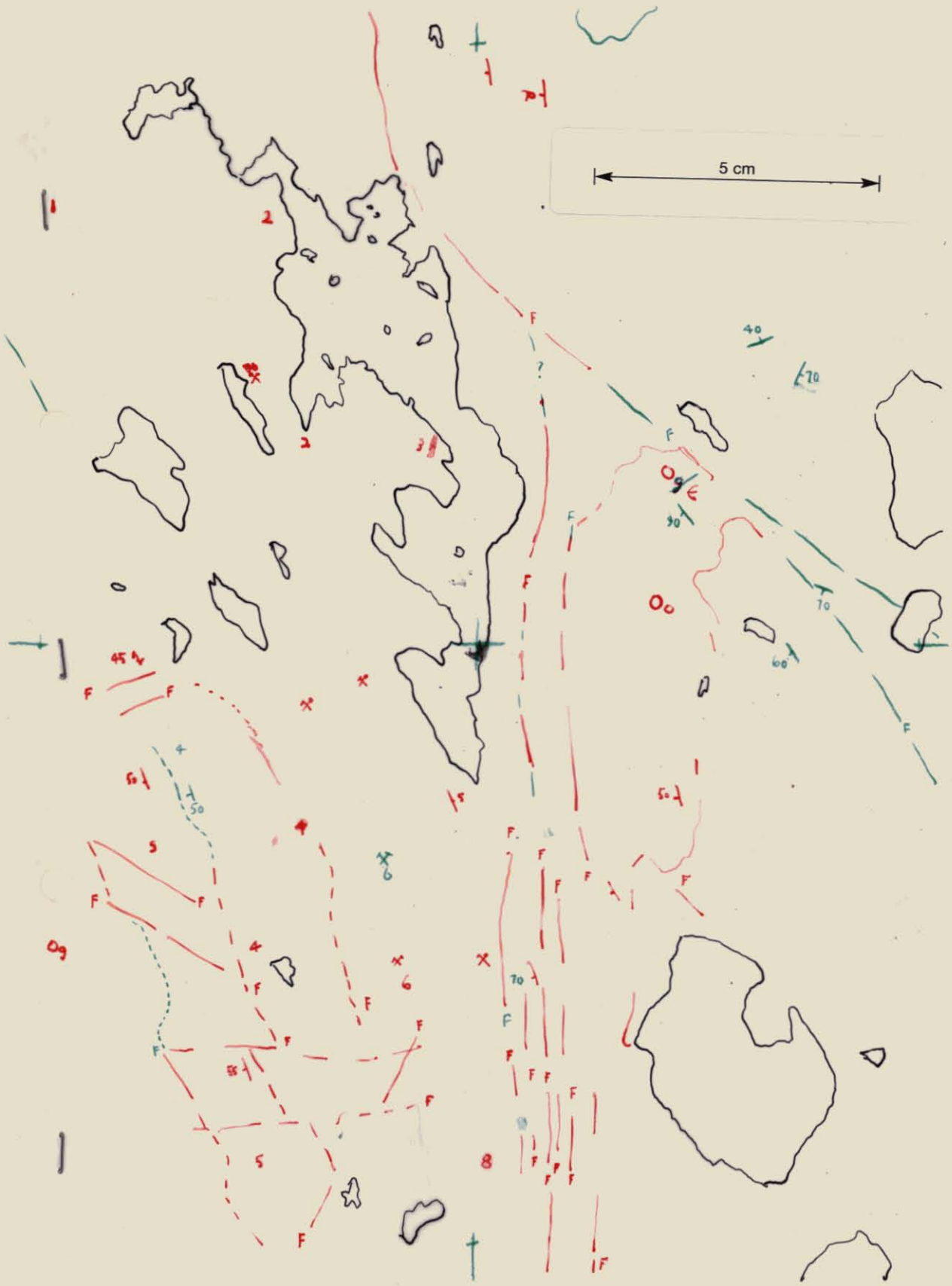
1)Chloritised quartz porph. Massive,schistose
2)chloritised quartz porph--greater schistosity than (1)
3)Quartz porph less slightly chloritised with qzite pebbles up to 6" plus cherty pellets--submarine equivalents of L)and 2)
4)Jukes breccia
5)Owen qzite and conglomerate
6)Water sorted pyroclastic,subrounded boulders of felsite in matrix ak n to the quartz porphyry.
7)Gordon li estone
8)faulted quartz porphyry and PC qzite

(plus section)

MURCHISON 3 – 23534

446058

003

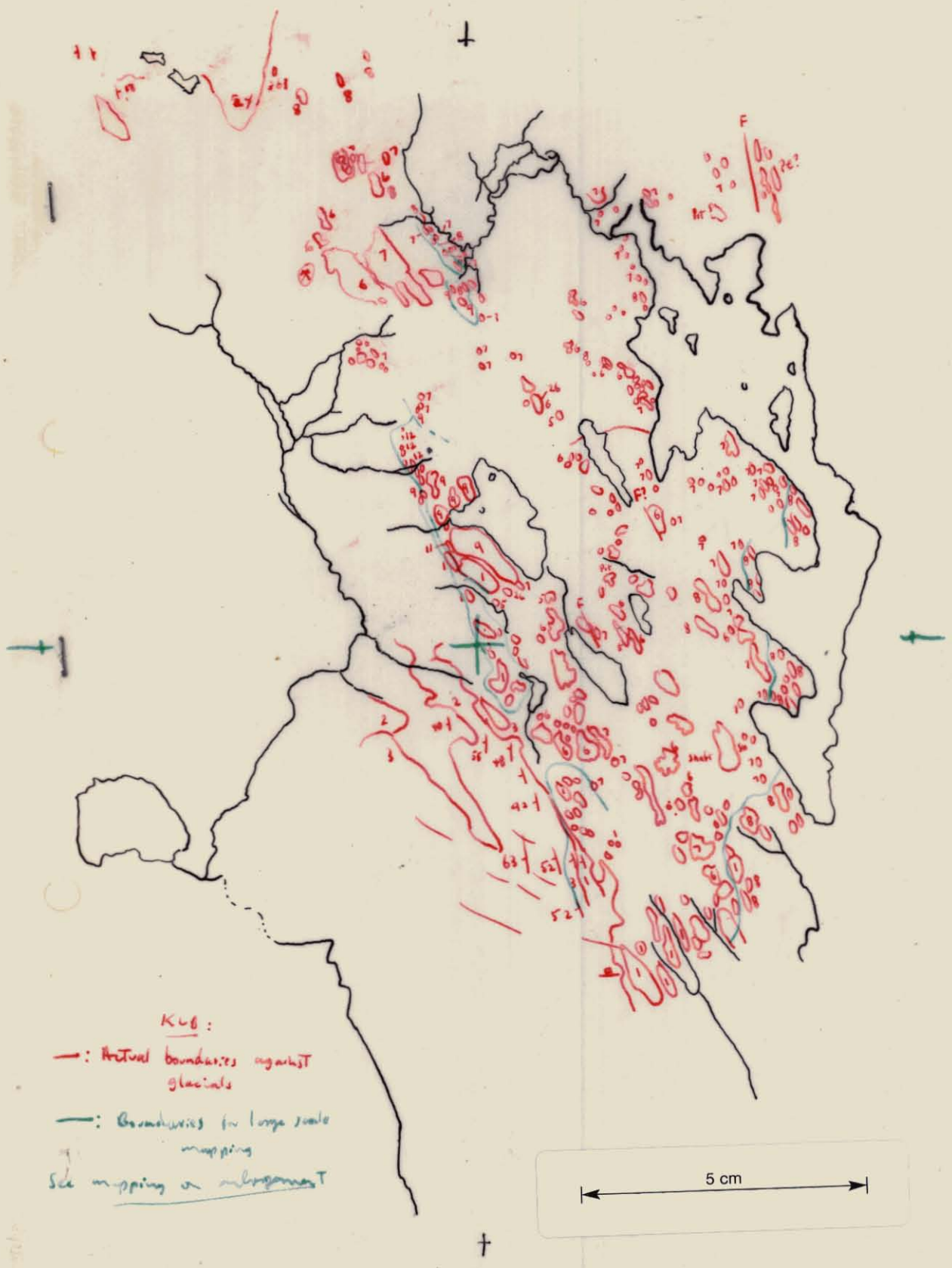


↑ RUN (3) · MURCHISON 23837

MURCHISON 3— 23535

446059

004



↑ RUN (3) MURCHISON No 23835

446060

005 MURCHISON Run 3 23835 A.B.C. 16/4/57

See 1"to 400' mapping on enlargement of this photo

61) Owen conglomerate 140/west--faulted & qtz veined

62) Impure silty li estone(Gordon Camb) 160/70W

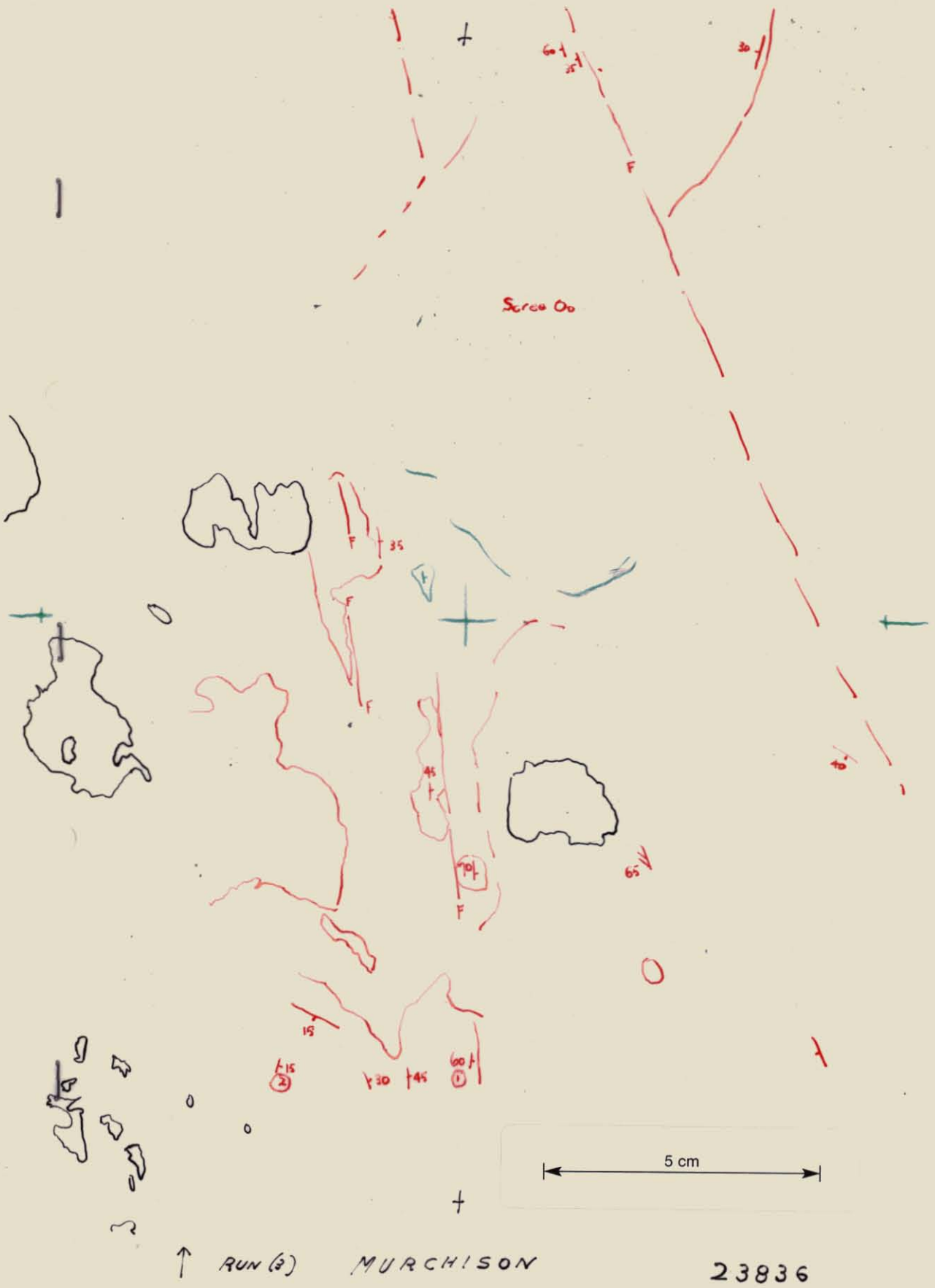
25) Massive felsite--to qtz porphyry 160/66W

26) Chloritised quartz porpph 155/70W Trenck(X)--Fe and Cu

MURCHISON 3-23836

006

446061



↑ RUN (3) MURCHISON 23836

MUR HISON Run 3 23836 R.B.F. Mar '58

(607 1)Pink-brown very coarse qzites Some bands pe bble and granule conglomerates interbedded bedding generally less than 3 feet
2)from 1)to 2)bedding remains thin.Conglomerate(granule-pebble) become more frequent--pink grey qzites--haematitic sparse argillaceous members-- relief about 500 feet from valley.
3)Ice smoothed exposures very coarse(boulder)conglomerstes. Lower Owen?

MURCHISON 3 – 23831

008

446063

RUN (3) MURCHISON 23837

009

Symbols: ooo cobble and boulder conglomerate

1)to 2):Pink-brown qzites,medium grain,crossbedded,imterbedded with thin bands,mainly granule(some pebble)conglomerates containing white to reddish angular to rounded quzartzite and fault quartz fragments. Most beds less than 2ft thick.Relief from 1)to 2) about 300 feet.
2)to 3):Mottlesd red-white conglomerate,cobble to boulder,rounded to angular,edgewise,sparse hematite matrix. Junction with 1)-2) unexposed but evidently not faulted.Very few fine bands.Possibly 600 feet stratigraphic thickness.Some folding,possibly some strike faulting.
4)to 5):As for 2)to 3)
6)Mainly pink and white quartzites,granule and pebble conglomerates, some quartz veining.

MURCHISON 3— 23838

446663

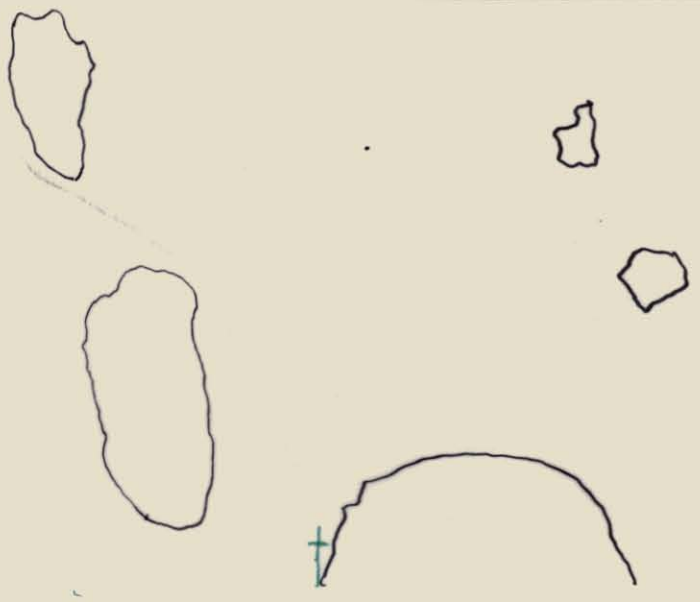
010

MURCHISON 3 — 23839

011

446066

5 cm



RUN (3) MURCHISON 23839

MURCHISON 3 — 23840

446067

012

↑ RUN (3) MURCHISON 23840

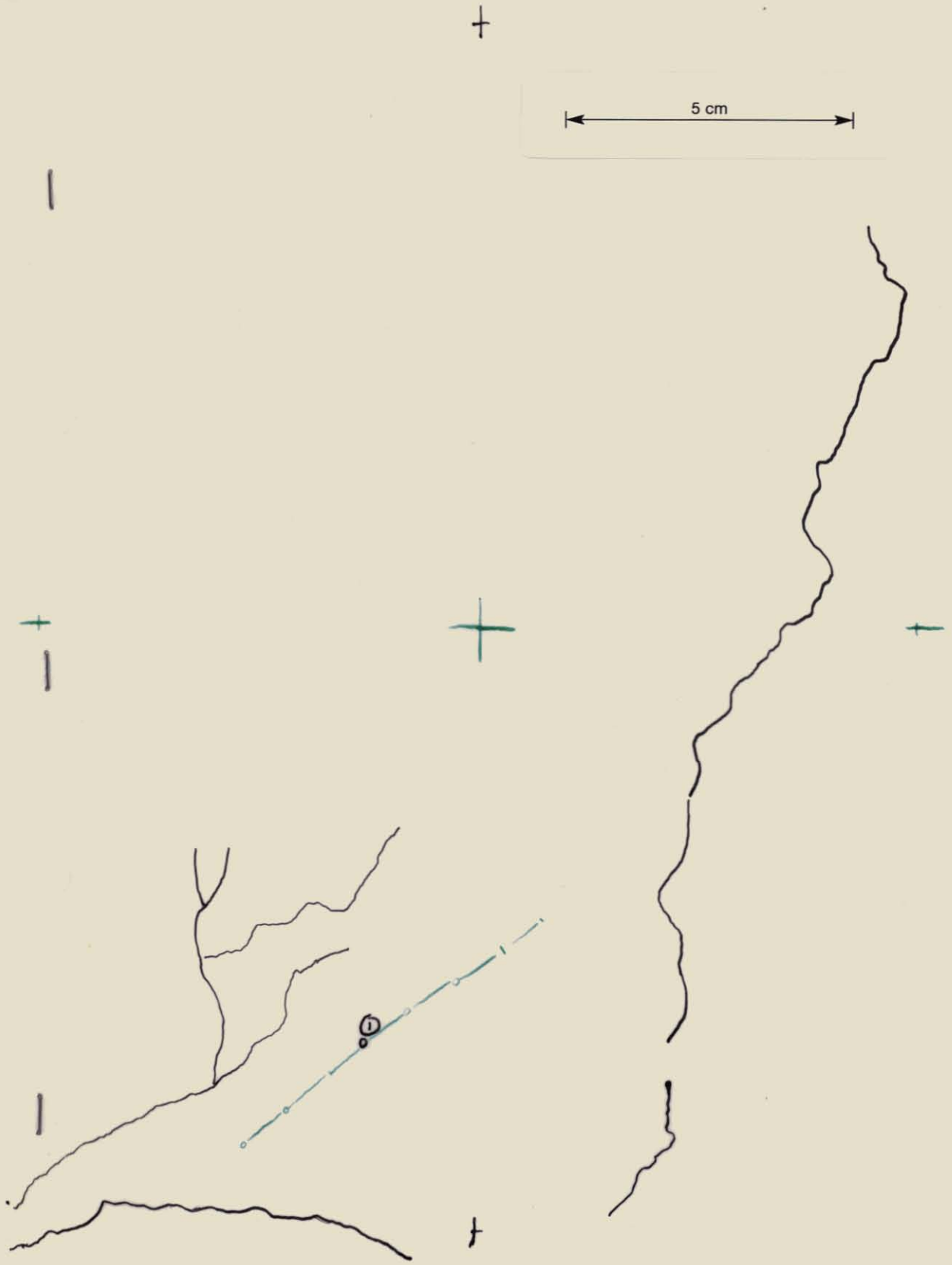
MURCHISON Run 3 23840 M.Solomon 446668

013 1)Pink and grey coarse siliceous conglomerate(Ool)Thin sandstones
2)Medium grained siliceous conglomerate(Oom)
3)Pinkish medium grained siliceous conglomerate and pale reddish sandstones,Middle Owen(Oom)

MURCHISON 3 – 23843

014

446069



MURCHISON Run 3 23843 M.Solomon

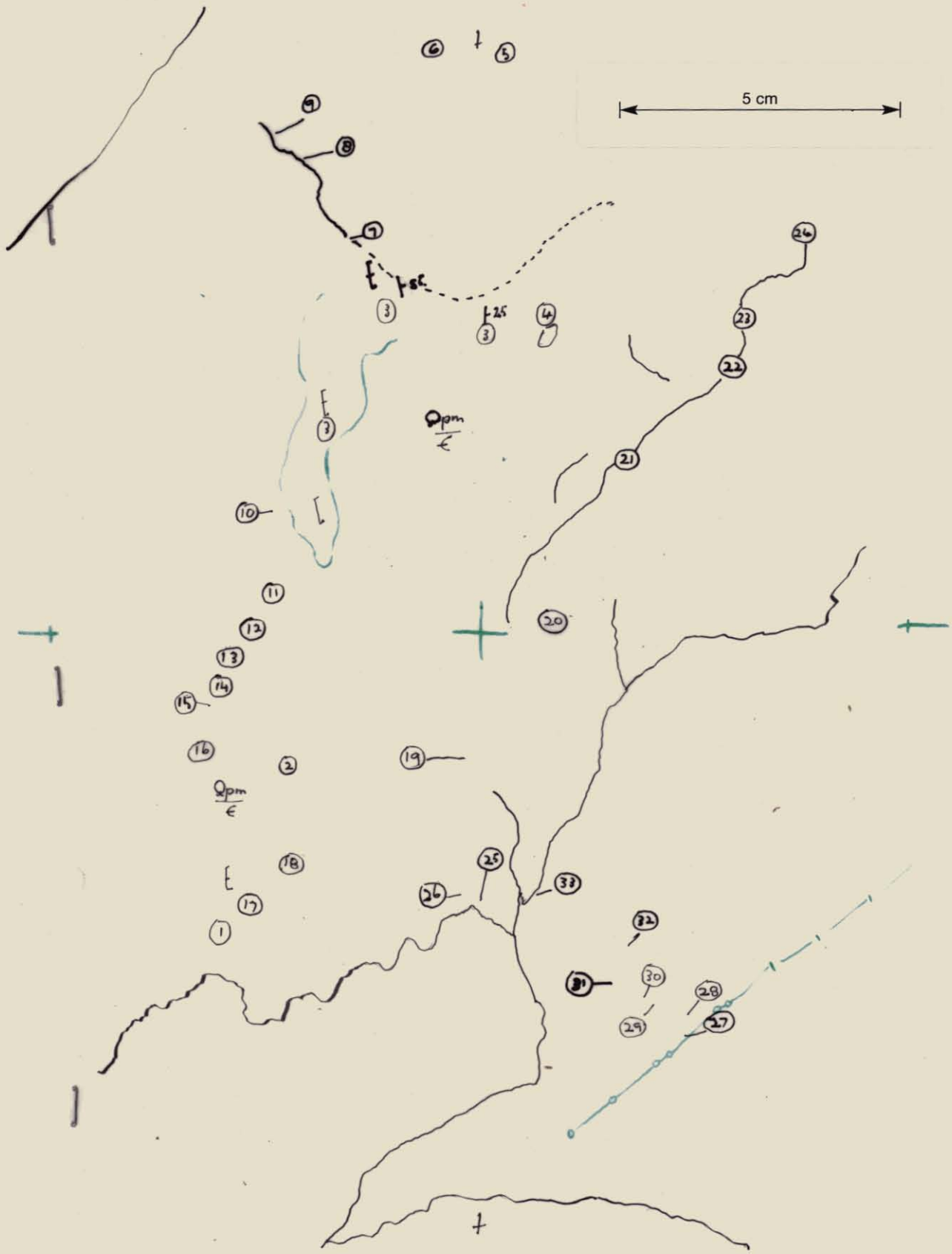
446070

015 1)Massive featureless green felspar porphyry

MURCHISON 3 — 23844

446071

016



MURCHISON Run 3 23844 446072

M.Solomon

1)Grey equigranular quartz-felspar rock with many fragments of cherty siltstone.
2)Boulders(in situ?)blue grey augite basalt.
3)Variable pale grey rocks,lightly shearded.Some like felspar porph, some like felspathic tuffaceous sandstone,some dense grey siltaton Very little bedding. Thin morainic cover
4)Massive blue grey augite-felspa porph ry,like Lynch creek basalts. Despite large size outcrop,this rock probably glacial erratic.

G.Fish 24-25-26/2/59

5)Banded very siliceous Cambrian slate plale-grey black in colour strike 350/80E
6)green faintly felspathic tuffaceous rock with well defined lineation 326
7)Pale blue coloured felspathic sandstone weathers to a fawn colour strike 350/steep E
8)Bluish felspathic tuffaceous sstone strike 360/60E interbedded with the chert
9)Fawn felspathic tuffaceous sstone strike 355/60E
10)Bluish felspathic rick probably a porphyry lineation 330
11)Green-blue felspar porphyry lineation 335
12)Blue siliceous quartz porphyry containing small(1mm)crystals of glassy quartz lineation 340
13)Grey blue cherty siltstone containing fragments of chert or slate Well defined shear direction at 345
14)Blue extrememly fine grained siliceous rock(cherty siltstone) lineation 340/steep E Well developed joint direction 110
15)Blue siliceous quartz porphyry
16)Same as (14) Bedding hard to discern
17)Same as (15) Lineation 340
18)Bale blue coloured chert
19)Bouldwrs of hornblende(?)porphyry--in situ?
20)Similar boulder outcrops of hornblende porphyry
21)Similar rock containing pyrite--again may not be in situ
22)Very siliceous green coloured lava(feldspar porphyry)lineation 34
23)Green lava same as (22)very fine grained
24)Large number of hornblende porphyry boulders
25)Green tuffaceous rock containing fragments up to 3mm in size lineation 320
26)Grey felspathic very fine grained siltstone Lineation 340
27)Green chloritic felspar porphyry good coutcrop massive no distinct lineation
28)Same as (27)less weathered lineation 340
29)Pale blue felspathic siltstone lineation 340interbedded with a banded grey black slate or shale strike 360/60E
30)Blue banded felspathic shale strike 355/60E interbedded with a green mineralised felspar porphyry lineation 330
31)Green felspathic tuff mineralised(pyrite) and containing chlorit
32)Green fairly siliceous lava containing phenocrysts of felspar and also grains of pyrite
33)Green felspar porphyry fairly finegrained siliceous matrix

MURCHISON 3 – 23844

446073

017

(1) Grey equigranular quartz-felspar rock ± many fragments cherty siltstone.
(2) Boulders (in situ??) blue-grey augite basalt.
(3) Variable pale grey rocks, lightly sheared. Some like felspar porphyry, some like felspathic tuffaceous sandstone, some dense grey siltstone. Very little bedding. Thin moraine cover.
(4) Massive blue grey augite-felspar porphyry, like Lynd Creek basalts. Despite large size outcrop., this rock probably glacial erratic
(5) Banded very siliceous & slaty pale-grey-black in colour Strike 350°/50°E
(6) Green fairly feldspathic tuffaceous rock well defined lineation - 320°
(7) Pale blue coloured ~~silst~~ feldspathic silst. weathers to a fawn colour Strike 350/steep E
(8) Bluish feldspathic tuffaceous ss Strike 360/60°E interbedded with the chert.
(9) Fawn feldspathic tuffaceous ss Strike 355/60°E
(10) Bluish feldspathic rock probably a porphyry lineation 320°
(11) Green-blue feldspar porphyry lineation 335°
(12) Blue siliceous quartz porphyry containing small (1 mm) crystals of glassy quartz lineation 340°
(13) Grey blue cherty siltstone containing fragments of chert or slate. Well defined shear direction at 345°.
(14) Blue extremely fine grained siliceous rock (cherty siltstone lineation 340/ steep E. Well developed joint direction 110°
(15) Blue siliceous quartz porphyry.
(16) Same as (14) Bedding hard to discern
(17) Same as (15) lineation 340°
(18) Blue pale coloured chert.
(19) Boulders of hornblende? porphyry – in situ?
(20) Similar boulder outcrops of hornblende porphyry.
(21) Similar rock containing pyrite – again may not be in situ.
(22) Very siliceous green coloured lava (feldspar porphyry) lineation 340°
(23) Green lava same as (22) very fine grained.
(24) Large mass of Hornblende porphyry boulders.
(25) Green tuffaceous rock containing fragments up to 3 mm lineation 320°
(26) Grey feldspathic very fine grained siltstone. lineation 340°
(27) Green chloritic feldspar porphyry good outcrop massive no distinct lineation
(28) Same as (27) less weathered lineation 340°
(29) Pale blue feldspathic silst lineation 340° interbedded with a banded grey black slate or shale Strike 360/60°E.
(30) Blue banded feldspathic shale Strike 355/60°E interbedded with a green mineralised feldspar porphyry lineation 320
(31) Green feldspathic tuff mineralised (pyrite) + containing chlorite.
(32) Green fairly siliceous lava containing phenocrysts of feldspar + also grains of pyrite
(33) Green feldspar porphyry fairly fine grained siliceous matrix

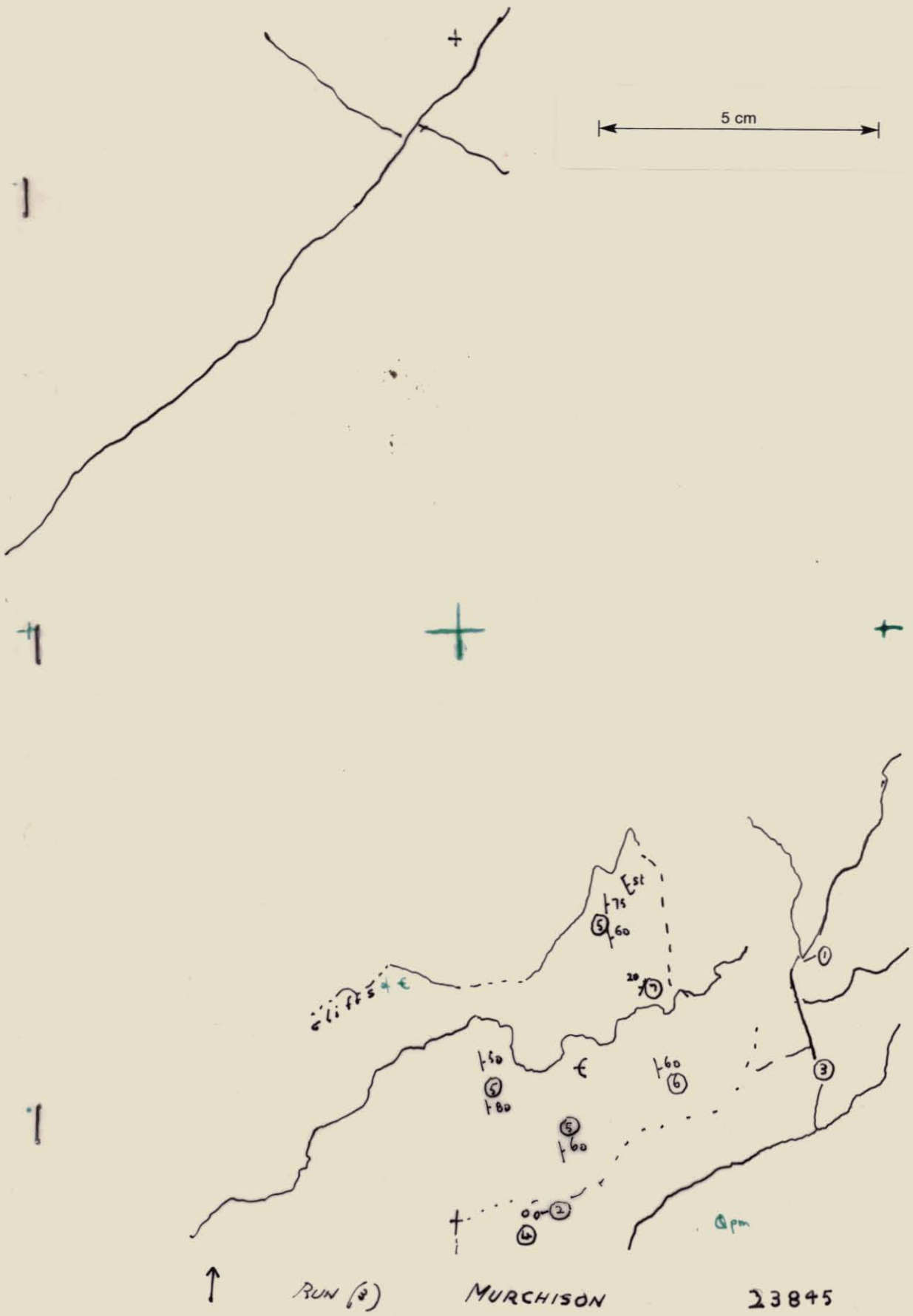
23844

Murchison Rub 3.

MURCHISON 3 – 23845

018

446074



MURCHISON Run 3 23845 M.Solomon

446075

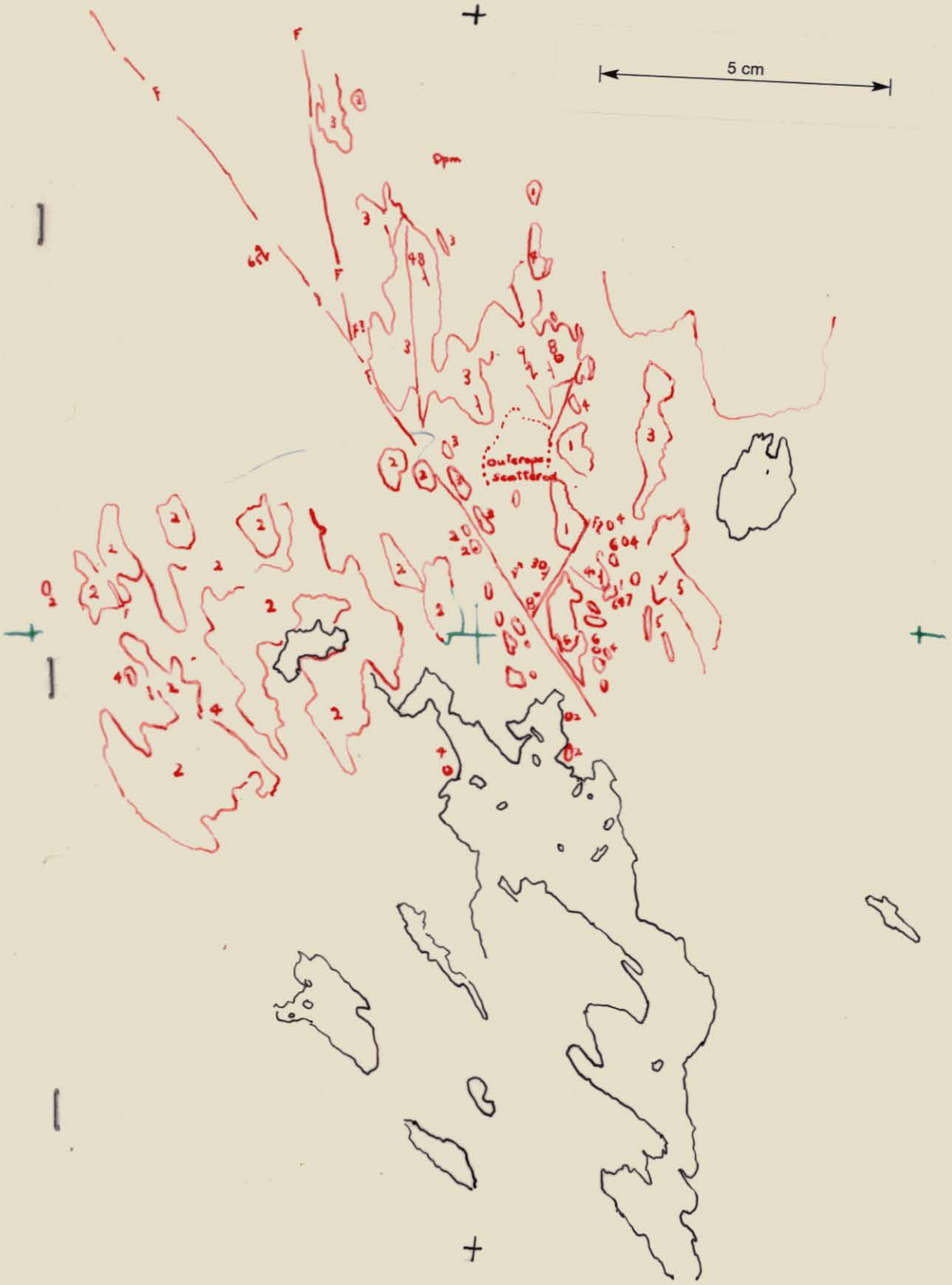
G 019

1)Grey shaley fine sandstone
2)Large boulders (in situ?)massive brown augite-felspar porph ry with amygdules filled with quartz,clacite and or prehnite.Rock contains fragments porphyry up to 1 foot.
3)Weathered felspar porph ry?Poor outcrop on track.
4)Grey-green chertysiltstones,main cleavage 330/vert. Banding at 350 350/steep E
5)Well bedded pale grey sandstone shaley bands show up by development of fracture cleavage. Dip always to E.
6)Cream-grey fine grained impure sandstone. Bedding poorly developed Some chert-like pebbles.
7)Grey highly ~~dexexxpxd~~ felspathic rock,crude cleavage(140/vert) Fairly well bedded but looks igneous. Arkose?

MURCHISON 4 - 31059

446076

020



RUN (4) MURCHISON 31059

RBF Nor 58

1 Pink-white quartzites and granule calts, occasional pebbly bands Owen Quartz veined minor argillaceous bands
2 Quartz + quartz felspar porphyry. Evidently extrusive. Stressed to quartz-chlorite and chlorite schists in part probably some derived sedimentary members. (Є)
3 Flaggy white grey quartzites. Slightly sericitic, interbedded with argillaceous (chlorite schist) material thin beds. Owen.
4 Tectonically brecciated quartzites and chlorite schists either at base of porphyry or within Owen probably the latter
5 Pre-Cambrian quartzites
6 "Porphyroid" uncertain in hand + field occurrence whether sedimentary (Owen) or Cambrian porphyry or derived sediment. Most likely inlier of porphyry in down-faulted Owen.
7 Siliceous rock, originally a limestone. Now silicified. Stratigraphic position and thickness indefinite. Either in Owen or at base of porphyry. Thickness probably not > 30'
8 Occurrence of zones of marked slaty cleavage in rocks of type 9
9 Mainly argyllaceous rocks (chlorite schists) with interbedded quartzites. Lithologically like (4) but without the marked tectonic brecciation. Lineation at 310° & 320° dipping West

Murchison Run 4

McRUMSON 5 – 23871

022

446078

RUN 5

MURCHISON

23871

5 cm

5 – 23871

McRUMSON

022

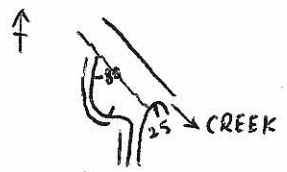
Murhison Run 5 No 2387I

(I). Green grey well jointed sandy shale.

(3). Dark grey rather impure sandstone, micaceous with some slatey bands. I5°/80° E, changing westward to 45°/60° SE.

(2). Purple slatey tuff(?); poor cleavage.

(4). Grey quartzite, similar to (3), tight folding, pitching 20°/25° S, and also a drag pitching 90°/65°E.



(5). Syncline in quartzites of (3)&(4): pitch I55/65 S.

024

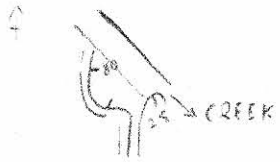
Murhison Run 5 No 2387I

(I). Green grey well jointed sandy shale.

(3). Dark grey rather impure sandstone, micaceous with some slatey bands. I5/80° E, changing westward to 45/60° SE.

(2). Purple slatey tuff(?); poor cleavage.

(4). Grey quartzite, similar to (3), tight folding, pitching 20/25° S, and also a drag pitching 90/65E.



(5). Syncline in quartzites of (3)&(4): pitch I55/65 S.

025

446080

(1) Green-grey well jointed sandy shale
(2) Purple slatey tuff(?); poor cleavage.
(3) Dark grey rather impure sandstone, micaceous, with some slatey bands. 15/80E, changing westward to 45/60SE then 110/60S.
(4) Grey quartzite, similar to (3), light folding, pitching 20/25S & also a drag pitching 90/65E.

(5) Synclines in quartzites of (3) & (4) : pitch 15 S/65 S.

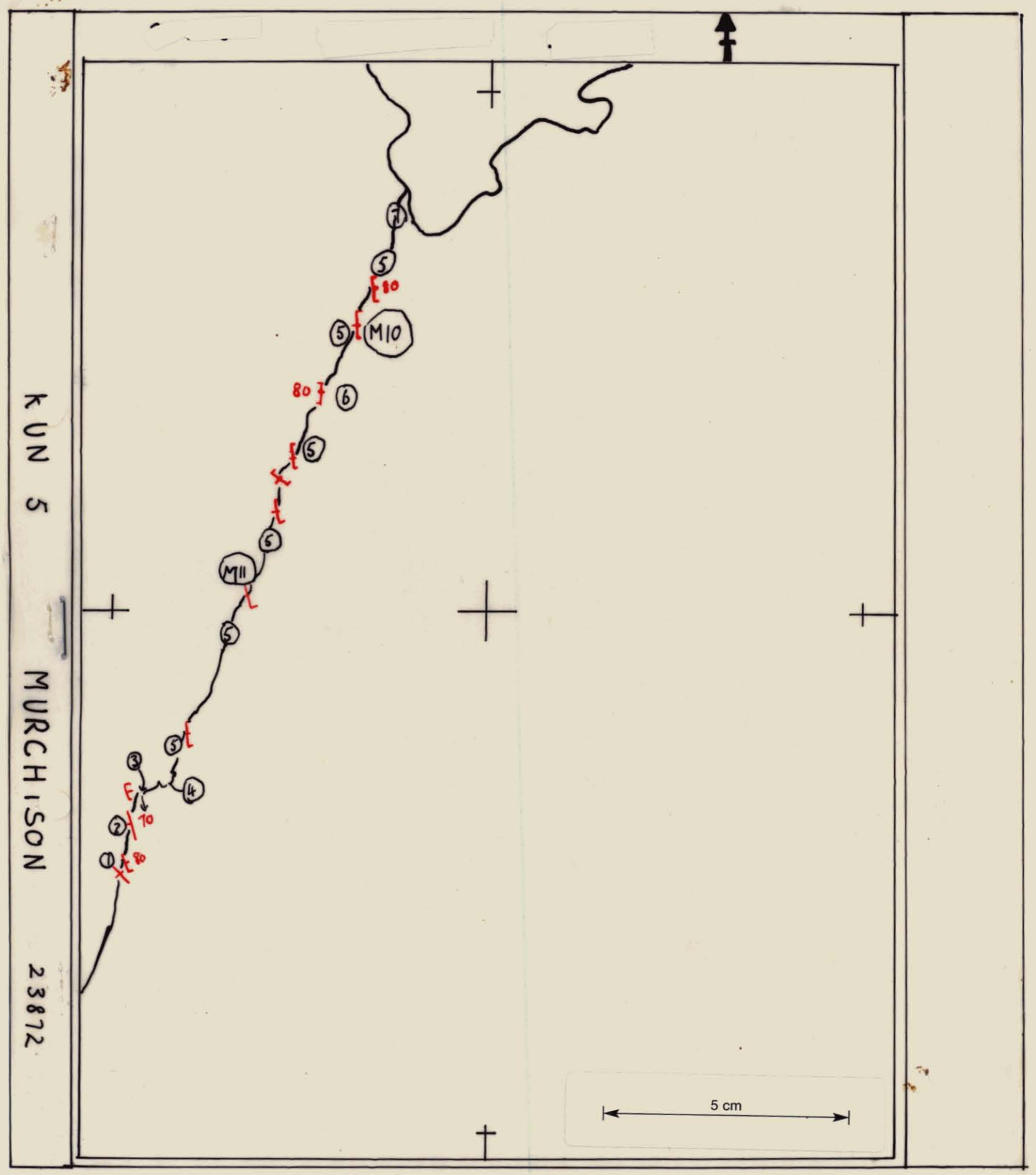
Murchison Run 5

23871

MURCHISON 5 - 23872

026

446081



027 Run 5 Murchison No 23872 446032

(I). Grey green slates, no bedding.

(2). Sheared quaetzose tuff or greywacke agglomerate, largly greenish sandy matrix with lenticular quartz pebbles. Some chromite(?) grains Alternates with micaceous sandy tuff.

(3). Purple and grey bedded shales; sandy tuffs. Foldingsymmetrical, pitches I60°/70°S.

(4). massive grey quartizites, rather impure.

(5). Grey to pale gyrey sheared felspar rock, featureless. Occasionally seems porpyritic with fine felspar phenocrysts in a silica-felspar aphemitic groundmass. Weathers pale brown. -mass cherts ?

(6). Grey sheared slates, pyritic.

(7). Alternation of (5), quartz felspar porphyry, and tuffaceous quartzose sandstone.

028

Run 5 Murchison No 23872 446083

(I). Grey green slates, no bedding.

(2). Sheared quaetzose tuff or greywacke agglomerate, largly greenish sandy matrix with lenticular quartz pebbles. Some chromite(?) grair Alternates with micaceous sandy tuff.

(3). Purple and grey bedded shales; sandy tuffs. Foldingsymmetrical, pitches I60/70S.

(4). massive grey quartizites, rather impure.

(5). Grey to pale gyrey sheared felspar rock, featureless. Occasionally seems porpyritic with fine felspar phenocrysts in a silica-felspar aphemitic groundmass. Weathers pale brown. -mass cherts ?

(6). Grey sheared slates, pyritic.

(7). Alternation of (5), quartz felspar porphyry, and tuffaceous quartzose sandstone.

029

446084

(1) ~~grey~~ green slates. ~~no bedding~~.
(2) Sheared quartzose tuff or grey wacke agglomerate; largely greenish sandy matrix with lenticular quartz pebbles. Some chromite(?) grains. Alternates with micaceous sandy tuff.
(3) Purple & grey banded shales; sandy tuffs. Folding symmetrical, pitches 160/70S.
(4) Massive grey quartzites, rather impure.
(5) Grey to pale grey sheared felspar rock, featureless. Occasionally seen porphyritic with fine felspar phenocrysts in a schist felspar aphanitic groundmass. Weathers pale brown.
(6) Grey sheared slates, pyritic.
(7) Alternation of (5), quartz felspar porphyry, & tuffaceous quartzose sandstone.

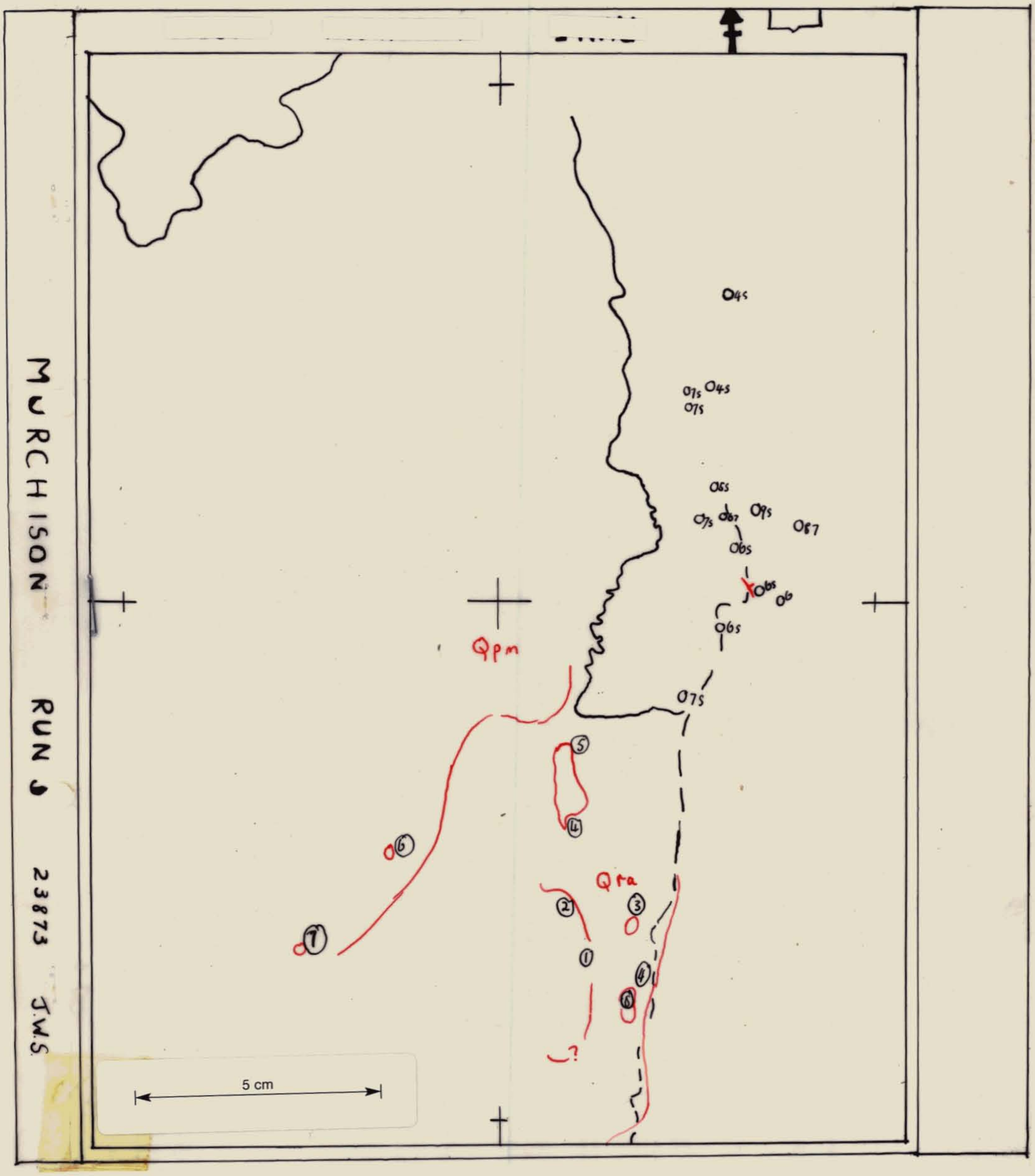
Rawdon River 5

23872

MURCHISON 5 - 23873

030

446085



5 - 23873
MURCHISON
030

(I). Quartz felspar rock, grain size medium, approx equigranular. Chert inclusions.

(2). Qf rock porphyritic to equigranular, locally with many inclusions of chert and slate, massive.

(3). Albite porphyry with epidote.

(4). Felspar porphyry, phenocrysts partly epidotosed. Iregular veins (magnetite).

(5). Felspar porphyry, With irregular fragments, similar material.

(6). Pale grey felspar porphyry with inclusions.

(7). Quartz veined fp.

(8). Massive equigranular felsphathic rock.

.....

S4. Quartz tuff . Trend 320°.

S4/. Quartz Tuff.

S5. Medium grained felsite.

S6. Medium grained felsite, with alternate bands of green and pink Bands I"-2" wide.

S7. Felsite with rounded pebbles of shale(?). Inclusions up to I2" in diamiter. Water sorted pyroclastics.

S8. Probable outcrop of slate.

S9. Quartz tuff trending 320°. One horizon has pebbles of felsite included in it. Slate lenses up to 3' long.

Murchison Run 5 NO 23873 J.WS.& Others.

(I). Quartz felspar rock, grain size medium, approx equigranular. Chert inclusions.

(2). Qf rock porphyritic to equigranular, locally with many inclusions of chert and slate, massive.

(3). Albite porphyry with epidote.

(4). Felspar porphyry, phenocrysts partly epidotosed. Iregular veins (magnetite).

(5). Felspar porphyry, With iregular fragments, similar material.

(6). Pale grey felspar porphyry with inclusions.

(7). Quartz veined fp.

(8). Massive equigranular felsphahic rock.

.....

S4. Quartz tuff . Trend 320°.

S4/. Quartz Tuff.

S5. Medium grained felsite.

S6. Medium grained felsite, with alternate bands of green and pink Bands I"-2" wide.

S7. Felsite with rounded pebbles of shale(?). Inclusions up to I2" in diamiter. Water sorted pyroclastics.

S8. Probable outcrop of slate.

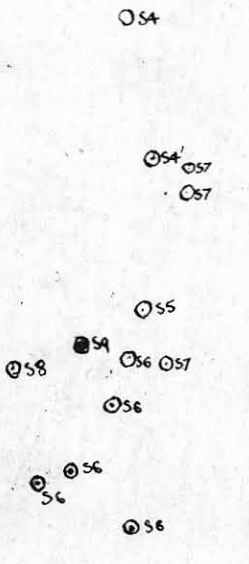
S9. Quartz tuff trending 320°. One horizon has pebbles of felsite included in it. Slate lenses up to 3'long.

446088

033

20/3/57

S4 Quartz Tuff Trend 320°
S4' Quartz Tuff
S5 M.G. Felsite
S6 Medium grained felsite with alternate bands of green & pink. Bands 1"-2" wide
S7 Felsite with rounded pebbles of Shale(?) Inclusions up to 12" in diam. "Water Sorted Pyroclastics".
S8 Probable outcrop of slate
S9 Quartz Tuff Trending 320°. One horizon has pebbles of felsite included in it. Slate lenses up to 3' long.



23873

Rhyolite R 5

S7

(1) Quartz felspar rock, grain size medium, approx. equigranular. Inclusions chert.
(2) Qf rock, porphyritic to equigranular, locally with many inclusions chert & slate.
(3) Albite porphyry ± veins epidote. Massive
(4) Felspar porphyry, phenocrysts partly epidotised. Irregular veins hematite (± magnetite).
(5) Felspar porphyry ± irregular fragments similar material.
(6) Pale grey felspar porphyry ± inclusions.
(7) Quartz veined
(8) Massive equigranular felspathic rock.

MURCHISON 5 – 23874

034

446039

035

MURCHISON 5-23874

446090

Ref Murchison 5/23873

⑦ Felsite ± rounded pebbles of shale up to 12" in diam. "Water-Sorted Pyroclastics".

① Medium bedded pale conglomerates & qzites, overlying conglomerate of ③ & overlain by reddish sandstone.

② Pink quartz-albite rock ± pellets siltstone & bands grey chert? or felspar(?). Knobbly appearance.
Locally contains many boulders of similar igneous rock, sometimes almost to exclusion of matrix, forming a "boulder bed". Crude cleavage.

③ Coarse-medium grained siliceous conglomerate, poorly sorted Col. Few sandstone bands.

④ Albite femag roughly equigranular rock, strong banding. Keratophyre?

⑤ Alternations pink-brown keratophyre; keratophyre boulder bed; sandy shale.
Keratophyre mainly pink felspar, some ferromagnesian, a few quartz crystals.

⑥ Boulders keratophyre, coarsely banded (probably not in situ). Also poor outcrop(?) grey cherty siltstone.

⑦ Red sandstone bed in coarse lower Owen conglomerate.

⑧ Massive pink mottled green pink quartz albite-chlorite rock ± clots of chlorite.

⑨ Lenses of cherty siltstone in pink albite-quartz rock containing many fragments cherty siltstone.

⑩ Massive outcrops pinkish mottled pink & green approx. equigranular rock loaded with fragments up to 6" diameter of keratophyre, siltstone, etc.

Outcrops along zone of ⑩, ⑨, ⑧, ⑤, ④ ② very similar in composition & appearance. Like rocks NW of Comstock.

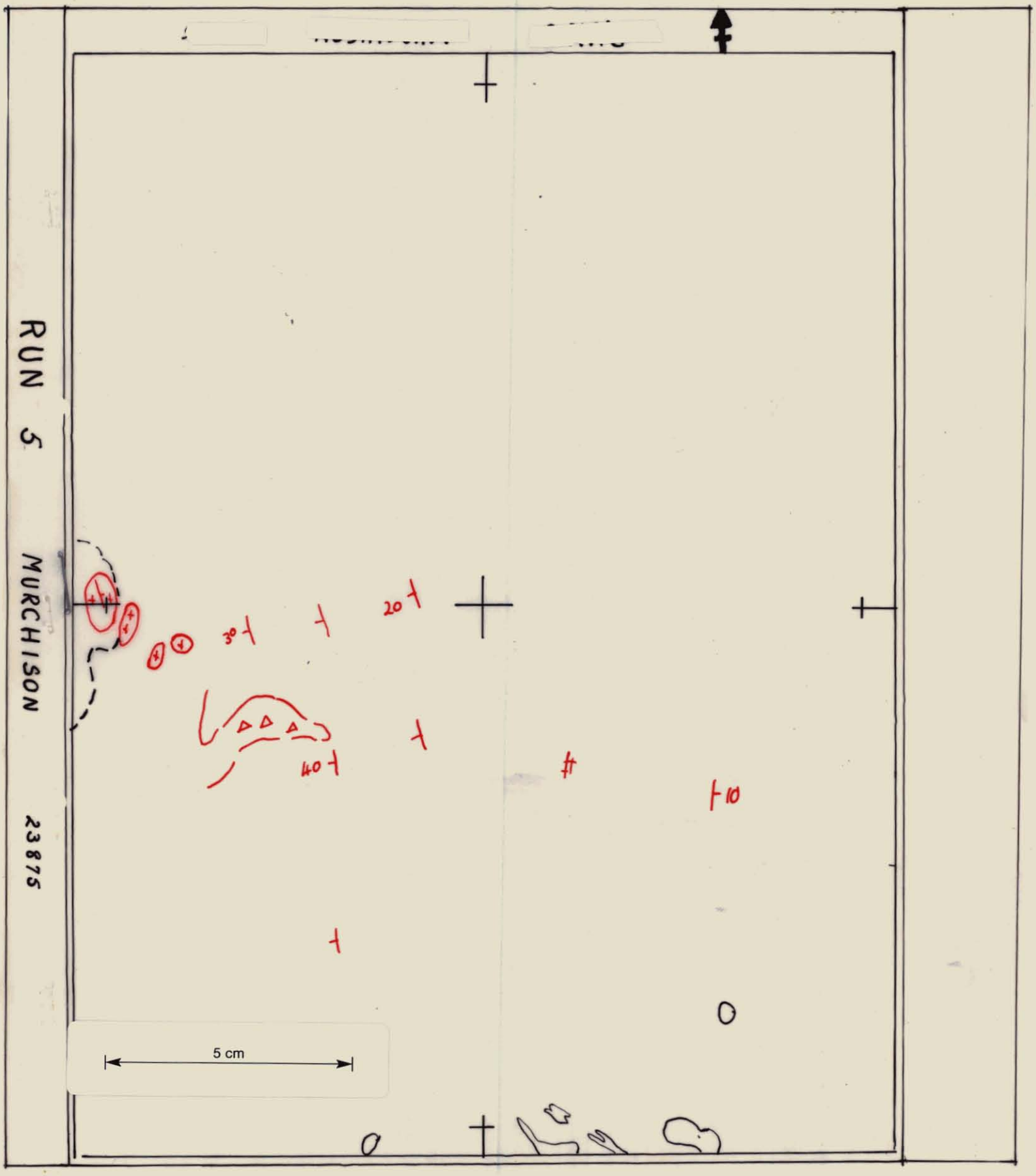
Murchison Run 5.

RIO AUSTRALIA EXPLORATION PTY LTD

036

MURCHISON 5 — 23875

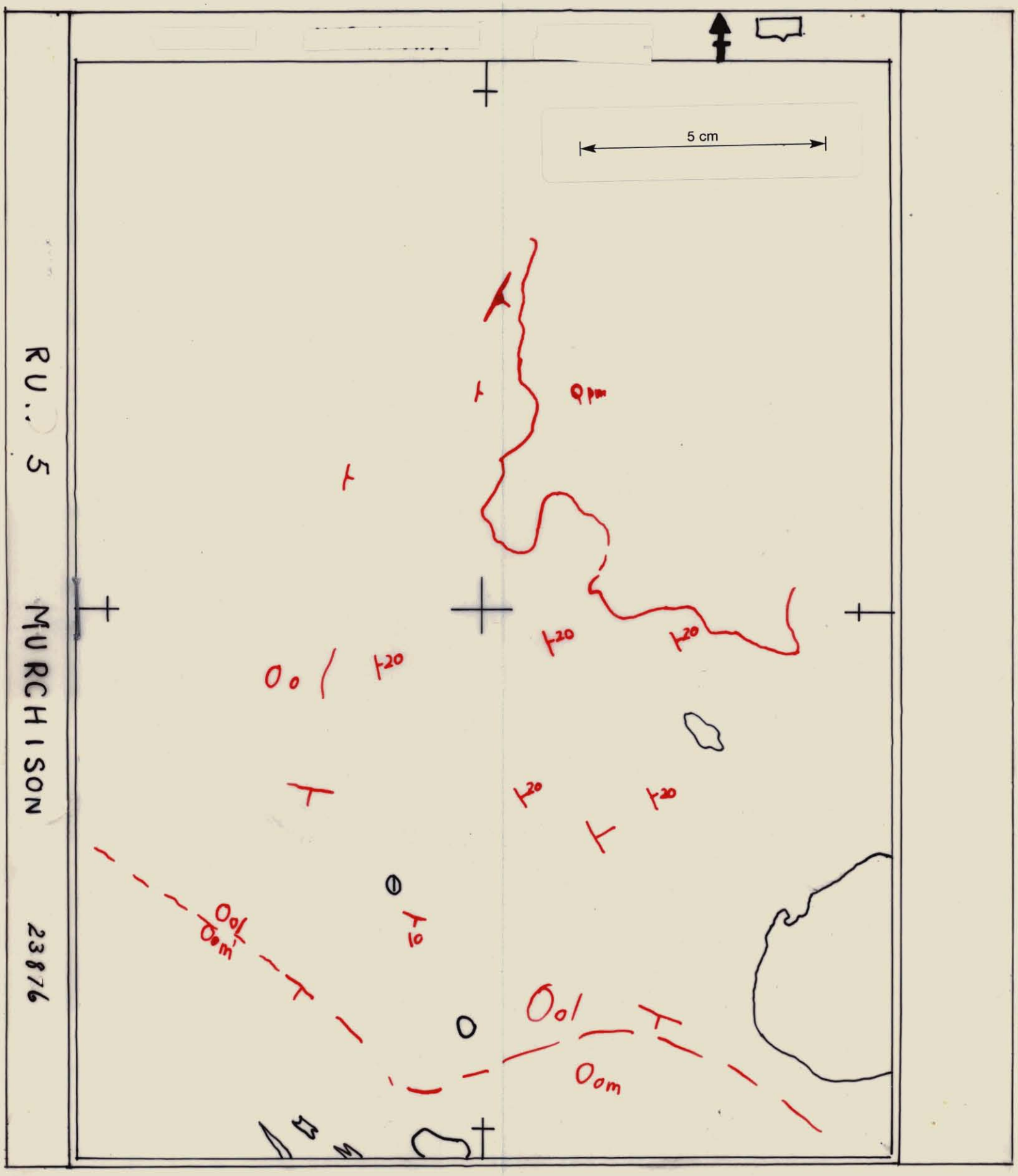
446691



037

MURCHISON 5 – 23876

446092



446093

038 Murchison Run 5 No 23876

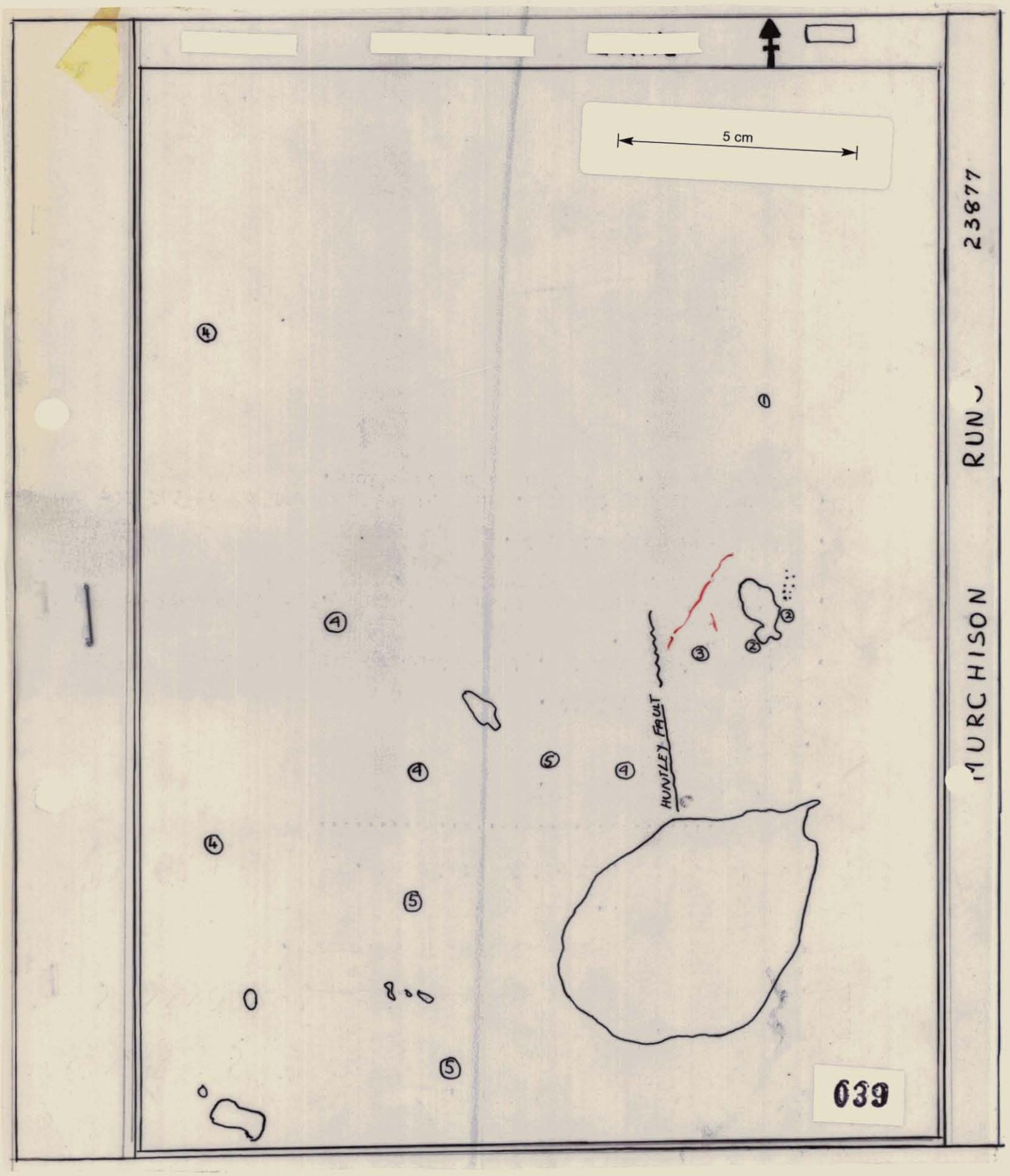
(I). Haematite fgagments, loose on boulders. Lower Owen Conglomerate.

040

446094

Murchison Run 5 No 23876

(I). Haematite fgagments, loose on boulders. Lower Owen Conglomerate.



MURCHISON 5 — 23877

041

446095

5 cm

Moraine

Glacial

Glacial

Glacial

Scrub

Scrub

Scree

Trees or Scrub

HUNTLEY FAULT

Lake

MURCHISON 5 - 23877

446096

042

① Fine-grained well bedded red-purplish sandstones, typically as low ribbed outcrops. Several interbedded pebble conglomerate, 3-4' wide. Much drag folding.

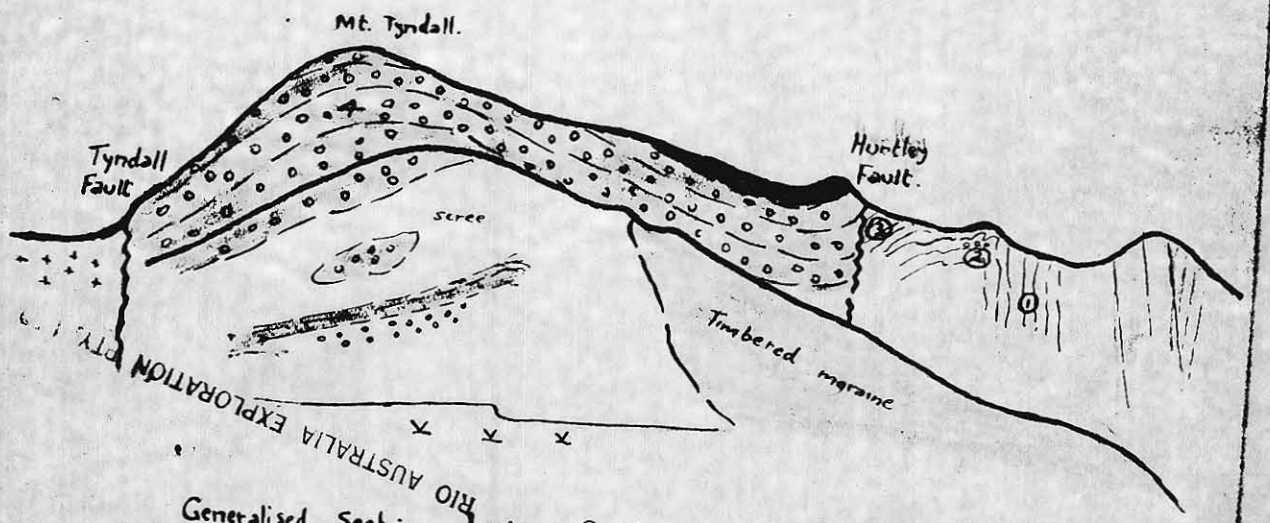
② Narrow band of pinkish cobble conglomerate.

③ Grey fine grained sandstone-quartzites. Partly well bedded. Drag folded and irregularly broken zone.

④ Massive conglomerate of Mt. Tyndall. Poorly sorted and generally coarse, pebbles up to 6 inches across. Variety of quartz pebbles, pink and white, rounded and angular, schistose and unstressed, greater than 500 ft. thick. Scarcity of fine matrix. Towards base occur interbedded red sandstones. Formation has generally pink aspect.

⑤ Marked lithologic change. Distinctly reddish purple pebbly sandstone-quartzites.

23877



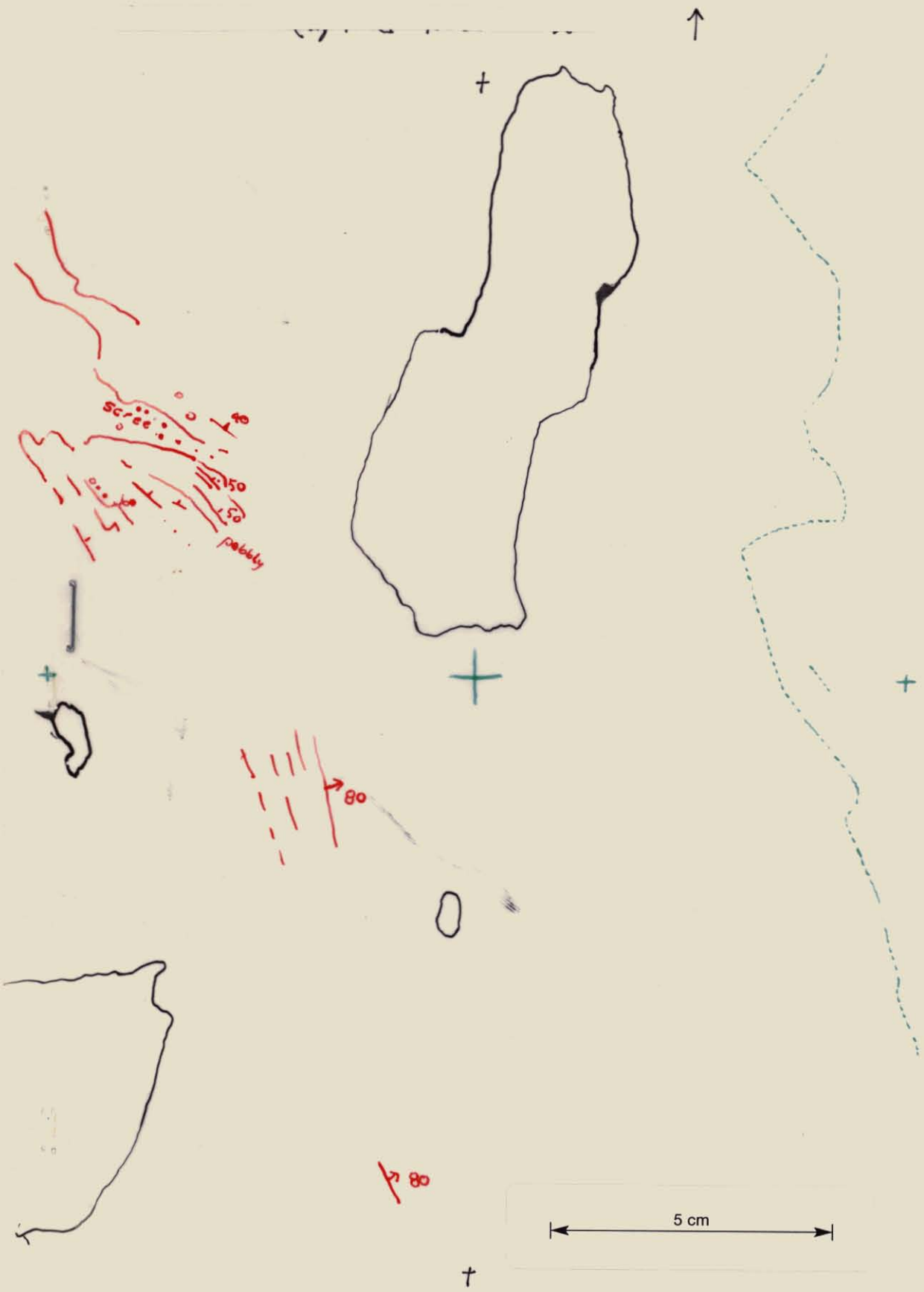
Generalised Section. Looking South across Tyndall Range. Latitude of Lake Rallestun.

Murchison Run 5.

HURCHISON 5— 23879 PLAN 'A'

043

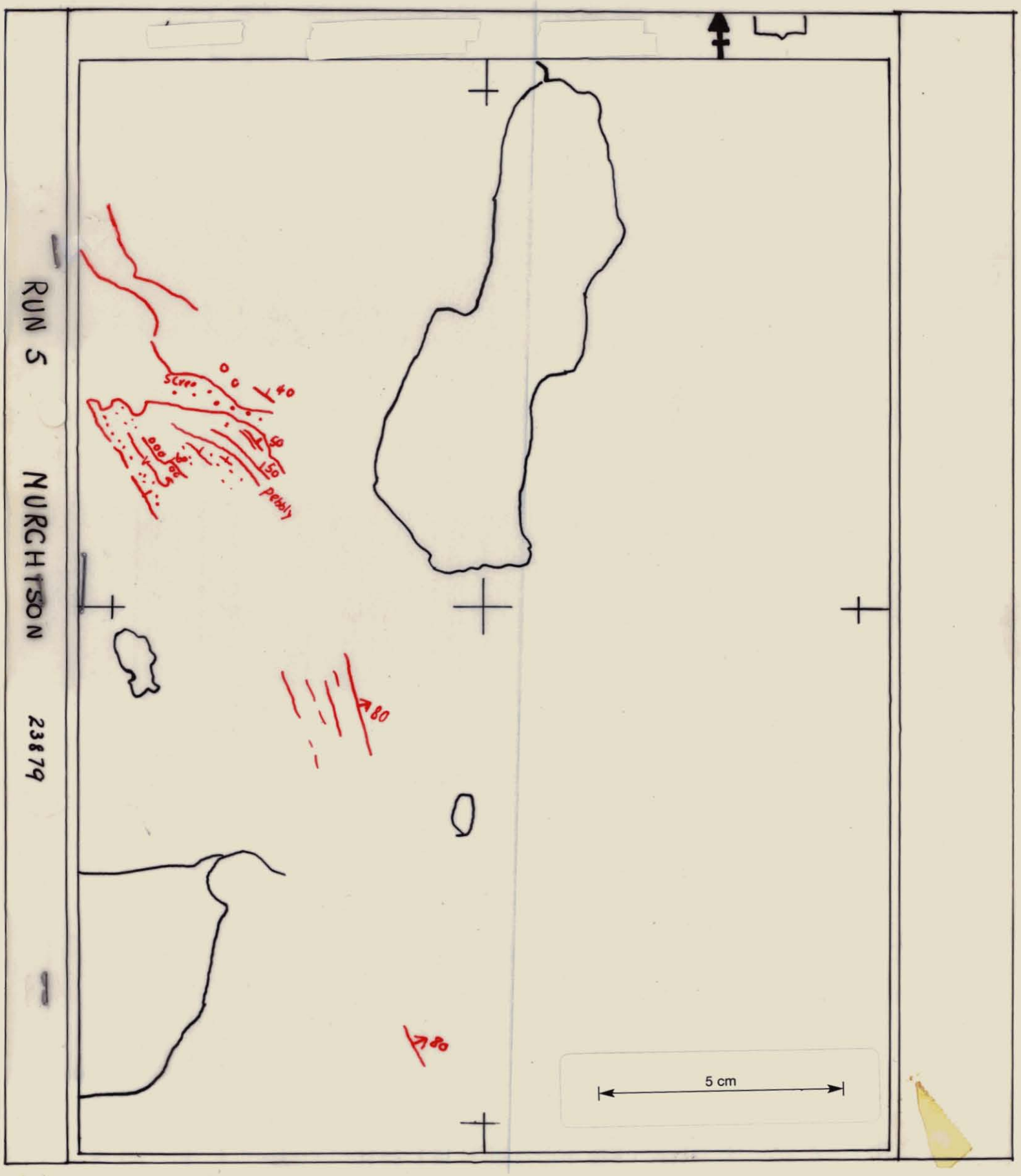
446097



044

NURCHISON 5 — 23879 PLAN 'A'

446098



446099

045

Murchison Run 5 No 23879 Photo 'A'

See photo 23877 for description west of Rolleston.

446100

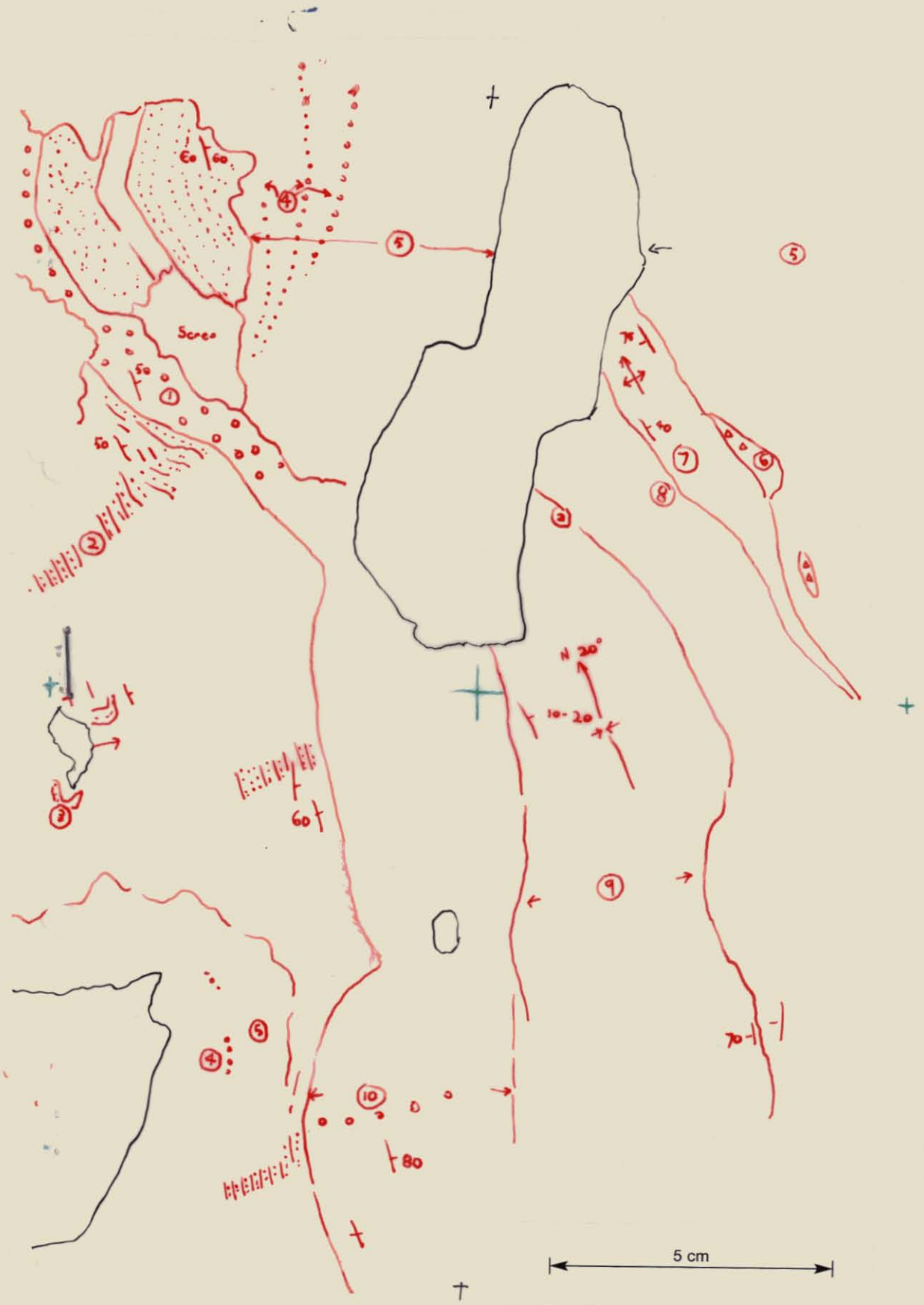
046 Murchison Run 5 No 23879 Plan 'A'

See photo 23877 for description west of Rolleston.

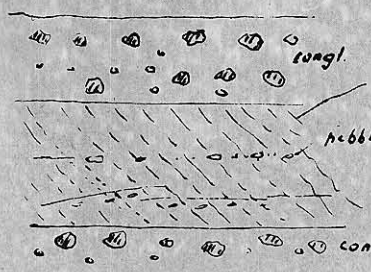
MURCHISON 5— 23879 Photo 'B'

047

446101



① Coarse, light-coloured unsorted conglomerate, with rounded and angular quartzite and quartz pebbles (of the Stick-Ranges Precambrian succession) up to 8" across. Thin, lenticular, coarse to medium grained interbedded sandstones (often cross-bedded, and showing ungraded boundaries with conglomerate layers). Also some richly hematitic layers at intervals. "False bedding" phenomena:



② Deep-purples well and thinly bedded quartzite-sandstones, finely cross-bedded in places, with magnificent slump structures (see coloured photos). Grains entirely of quartz.

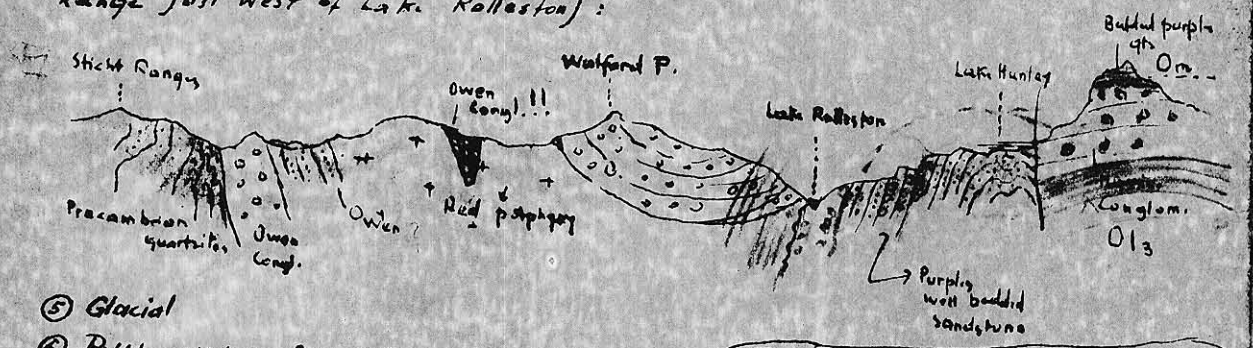
③ Grey quartzites.

The succession ①-②-③ is in descending order and in normal position.

④ Fronts of lateral moraine, marking stages of retreat of the glacier flowing through the U-valley between Watford Peak and Lake Celina. (Note the asymtotic convergence of the 3 moraine ridge, and the hanging cirque of Lake Huntley and the "gorge de raccordement" between Lake Huntley and Lake Rolleston)

23879

General section through Stickt-Ranges-Watford P.-Lak. Huntley (as seen from the Range just west of Lake Rolleston):



⑤ Glacial

⑥ Pebbly, schistose, felspathic conglomerate

⑦ Owen Conglomerate (pebbly quartzite) in pinched syncline.

⑧ Quartz porphyries (stressed and chloritic), carrying heavy mineral grains.

⑨ Owen Conglomerate in synclinal structure (sharp pitch to the north)

⑩ Owen conglomerate.

Possible major fault between ⑨ and ⑩

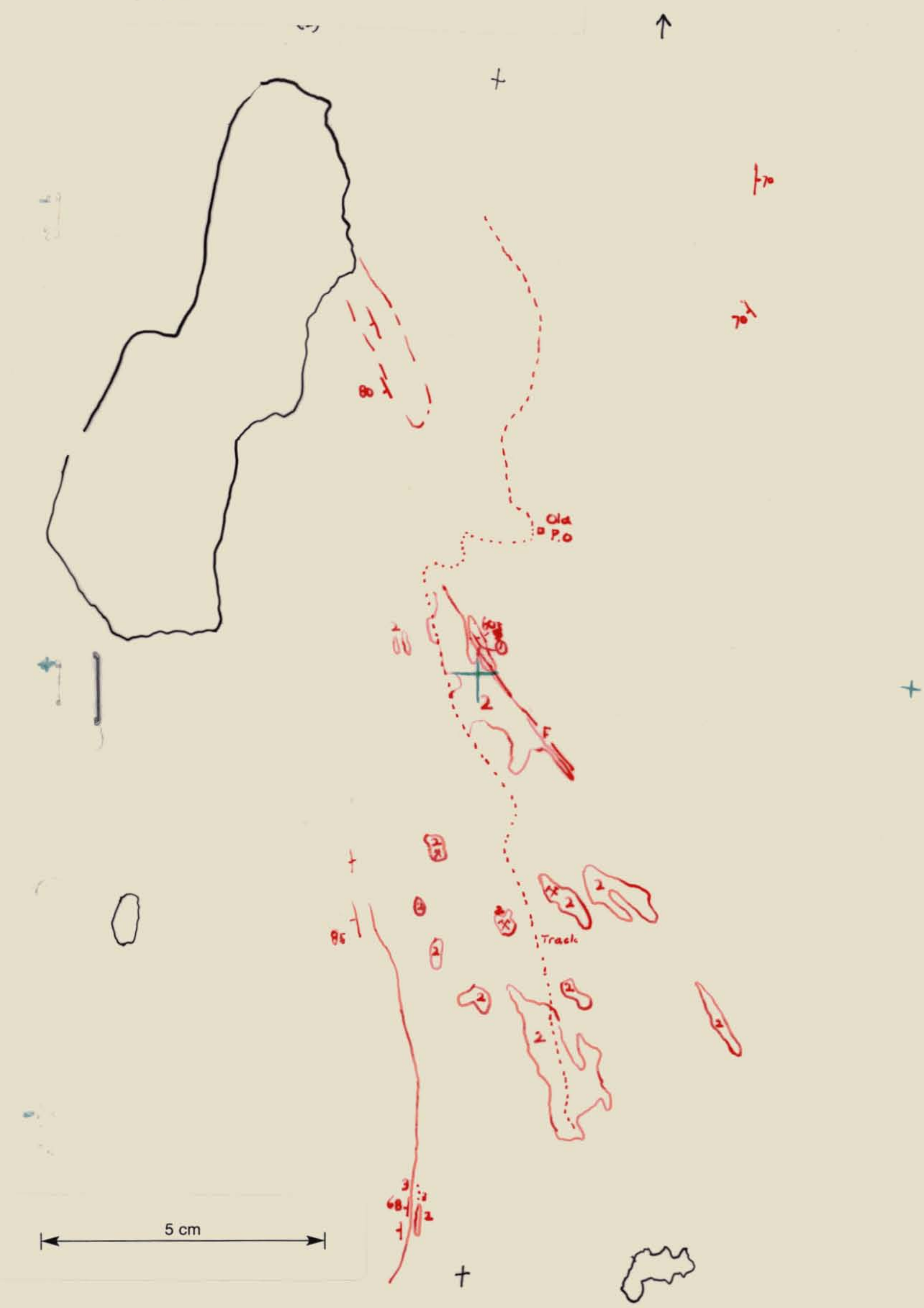
J. Campana, D. King, W. Brooks II-1958

Murchison Rua 5 23879

MURCHISON 5 — 23880

049

446103



050

446104

A.B.C. 14/4/57

28. Chloritised quartz porph. Sch. 145/85°W1
29. pE-Carbine Quartzite 140/70°W
30. Quartz porph. 148/70°W.
31. Trench Quartz. porp, & Fe.
32. Owen Congl. 165°/85°W. Major fault
33. Owen Congl 165/70°W.
34. " " 165/70°E faulted
along strike and overturned

R.B.F. Feb 58

① Owen: sdsts, granulegil U - Unconformity
② Cambrian extrusive porphyry - possibly some sedimentary bands
3 Lower Owen cobble-boulder cgit in cliff face.

D28
D29
D30
D31
D32
D33
D34
D35

RIO TINTO EXPLORATION PTY. LTD.

23880

MURCHISON 5 — 23881

053

446105

16/4/57. A.B.C.

48- 47 Massive white quartzite - pЄ ? 170/60°W Carbine -
49 Folded flaggy quartzites 140/50°W pЄ. Carbine
50 Chloritised quartz schist 140°/70°W. pЄ.
51 Flaggy quartzite and phyllites 145°/50°W
52 Owen. Congl. 175°/V to 80°W. faulted - quartz veined

{60 Owen Congl. faulted - quartz veined 60° - 135°/30° NE
{61 RBF Feb 58 61 - Vertical
(62) Massive quartzites pЄ contact with Owen not exposed -
(63) Owen flaggy qtzites some argyllaceous material

Murchison R 5

23881

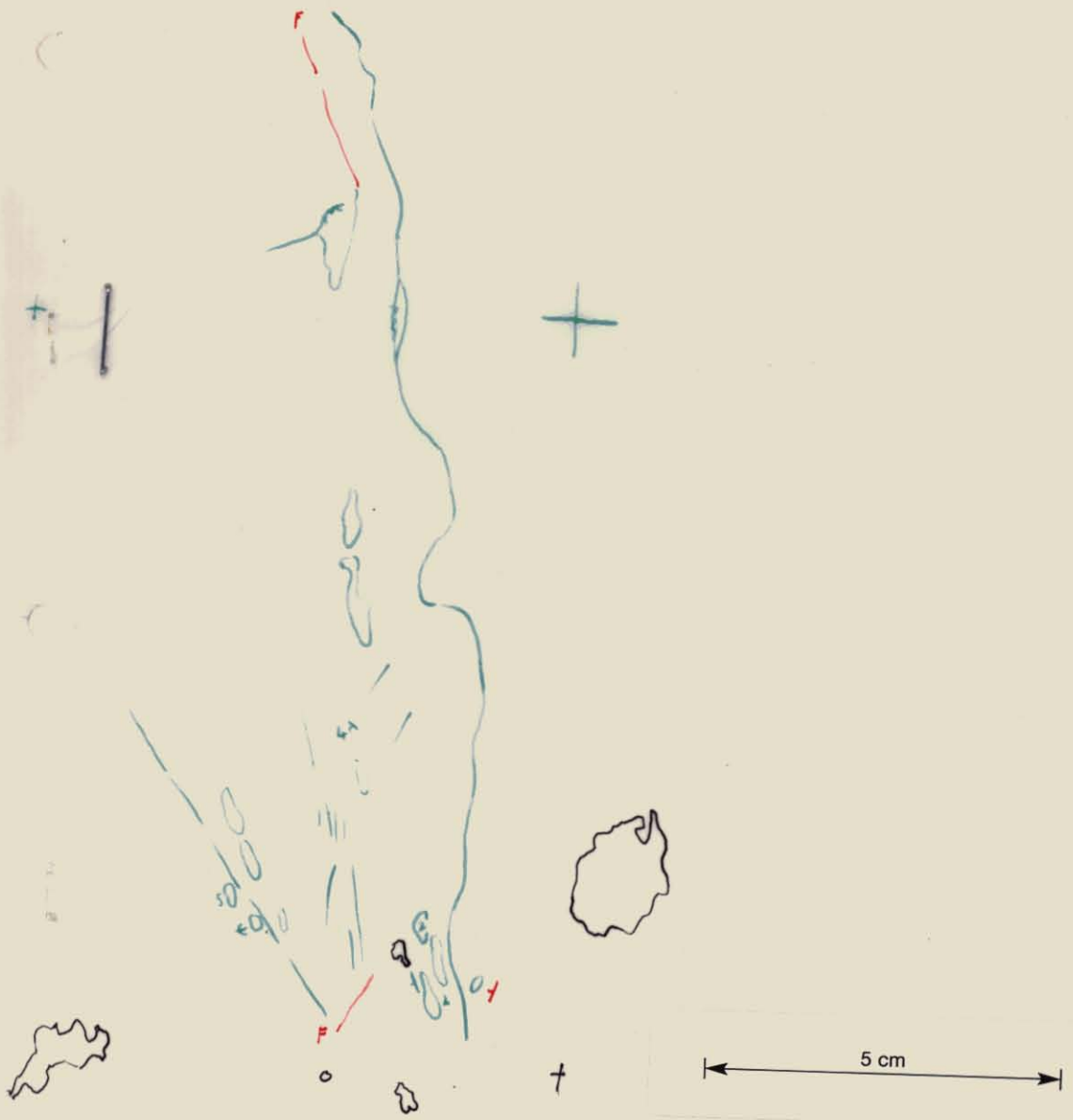
RIO AUSTRALIA EXPLORATION PTY. LTD.

60
61
61
49
48
47
50

MURCHISON 5 — 23882

051

446107



57-190

RIO TINTO FIELD WORK

MURCHISON QUADRANGLE 51

Table of Contents - Vol III

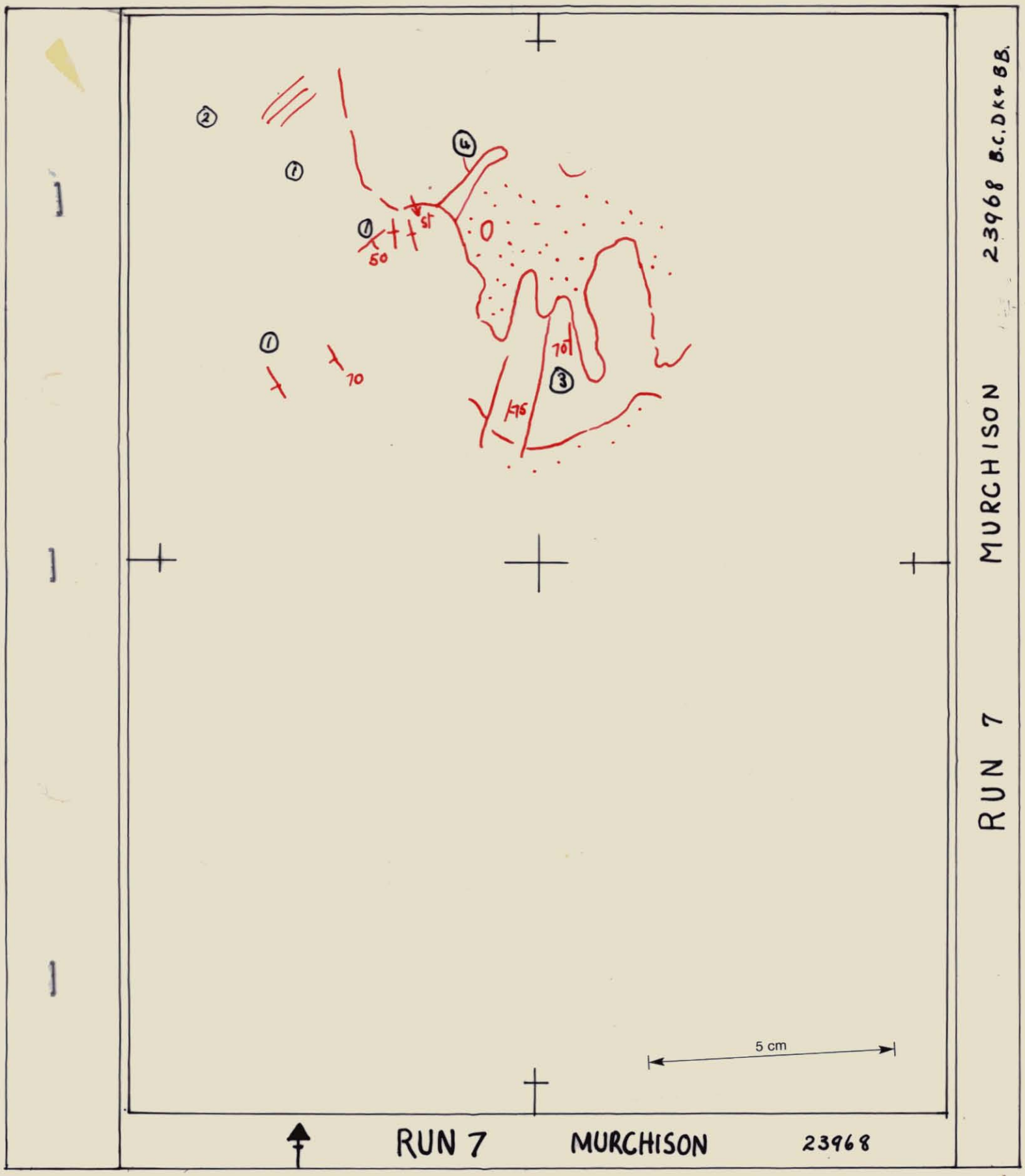
20 CHAIN PHOTOS RUNS 7, 8

VOL III	7	23968.	✓			✓				✓
		969.	✓			✓				✓
		23970.	✓			✓				✓
		971.	✓			✓				✓
		972.	✓	✓	✓					✓
		973.	✓			✓				✓
		974.	✓	✓	✓					✓
		975.	✓	✓	✓					✓
		976.	✓			✓				✓
		977.	✓	✓	✓					✓
	8	23978.	✓	✓						✓
		979.	✓	✓						✓
		23980.	✓	✓	✓					✓
		981.	✓	✓	✓					✓
		982.	✓	✓						✓
		983.	✓	✓	✓					✓
		984.	✓	✓	✓					✓
		985.	✓			✓				✓
		986.	✓			✓				✓
		987.	✓			✓				✓

MURCHISON 7 — 23968

090

446110



446111

001

Murchison Run 7 NO 23968 B.C-D.K.& B.B.

(I).Highly siliceous quartzites.

(2). " " " admirably drag-folded(see B.C n/b no 4

(3).Dark shaley(?) beds in cliff face.

(4).Moraine.

002

Murchison Run 7 NO 23968 B.C-D.K.& B.B.

(1). Highly siliceous quartzites.

(2). " " " admirably drag-folded(see B.C n/b no 4

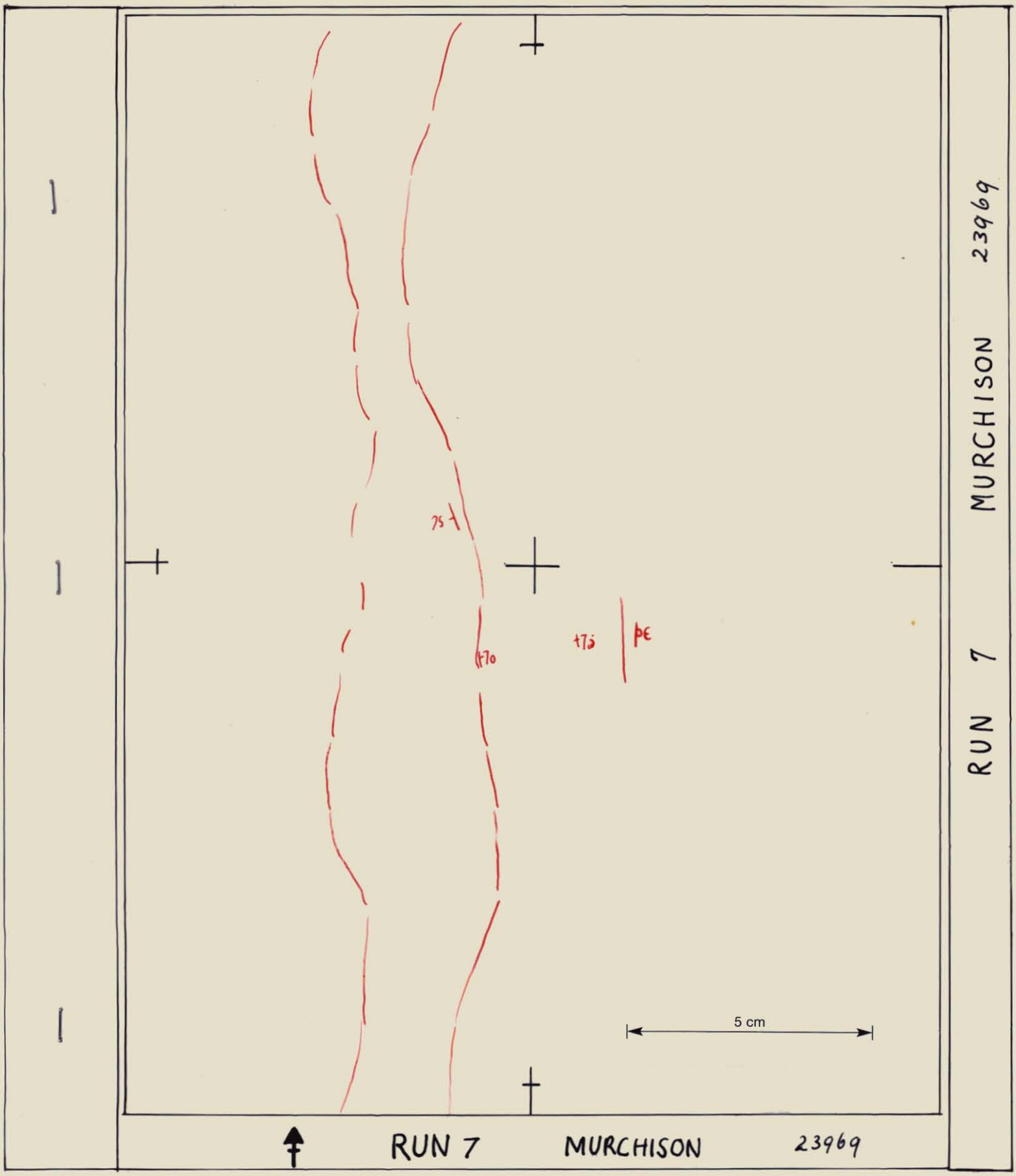
(3). Dark shaley(?) beds in cliff face.

(4). Moraine.

MURCHISON 7-23969

003

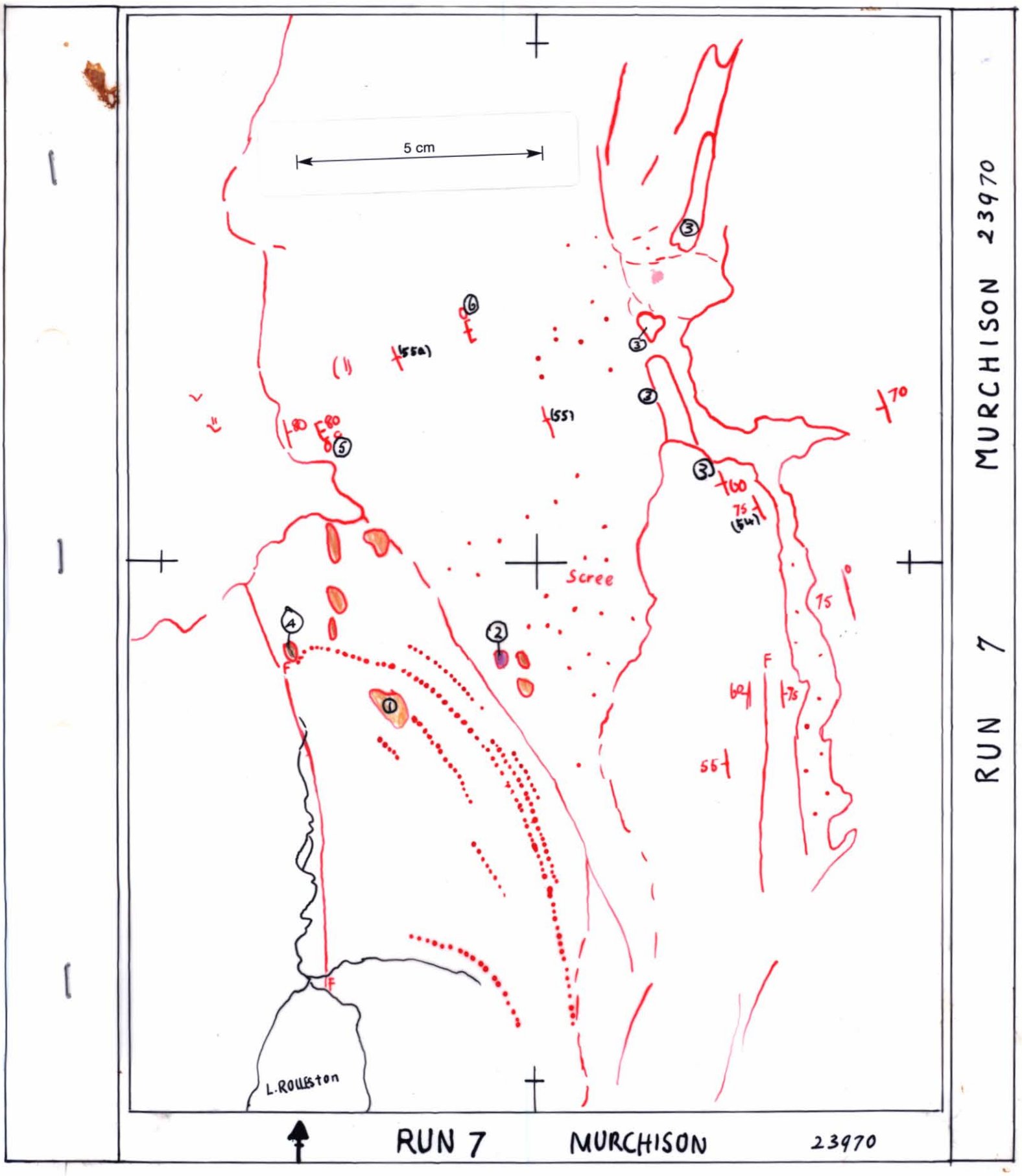
446113



MURCHISON 7-23970

004

446114



005

446115

Murchison Run 7 No23970 A.B.C.

(54). Owen Conglomerate. (haematite coloure pebbles 6") I60°/75° E- faulted and overturned.

(55). Chloritised quartz porphyry.

(55a). ditto (55).

(I). Felspar porphyry, massive groundmass chloritised.

(2). Schistose felspathic conglomerate, rich in pebbles of quartz.

(3). Coarse Owen Conglomerate.

(5). Sheared quartz felspar porphyry, phenocrysts average 7mm diameter.

(6). Brown quartz felspar porphyry, poorly developed cleavage, Quartz keratophyre.

Murchison Run 7 No23970 A.B.C.

(54). Owen Conglomerate. (haematite coloure pebbles 6") I60°/75° E- faulted and overturned.

(55). Chloritised quartz porphyry.

(55a). ditto (55).

(I). Felspar porphyry, massive groundmass chloritised.

(2). Schistose felspathic conglomerate, rich in pebbles of quartz.

(3). Coarse Owen Conglomerate.

(5). Sheared quartz felspar porphyry, phenocrysts average 7mm diameter.

(6). Brown quartz felspar porphyry, poorly developed cleavage, Quartz keratophyre.

007 446117

16/4/57. A.B.C.

54. Owens Congl. (hematite coloured pebbles 6") 160/75°E – faulted & overturned

55. ~~ditto 54~~ ~~/vertical to~~ 60°E –
Chloritized quartz porp.

55A ditto 55

(2) [illegible]

3) [illegible]

(5) Sheared quartz felspar porphyry, quartz phenocrysts average 7 mm diameter

(6) Brown quartz felspar porphyry, poorly developed cleavage. Quartz keratophyre

•55A

•55

•54

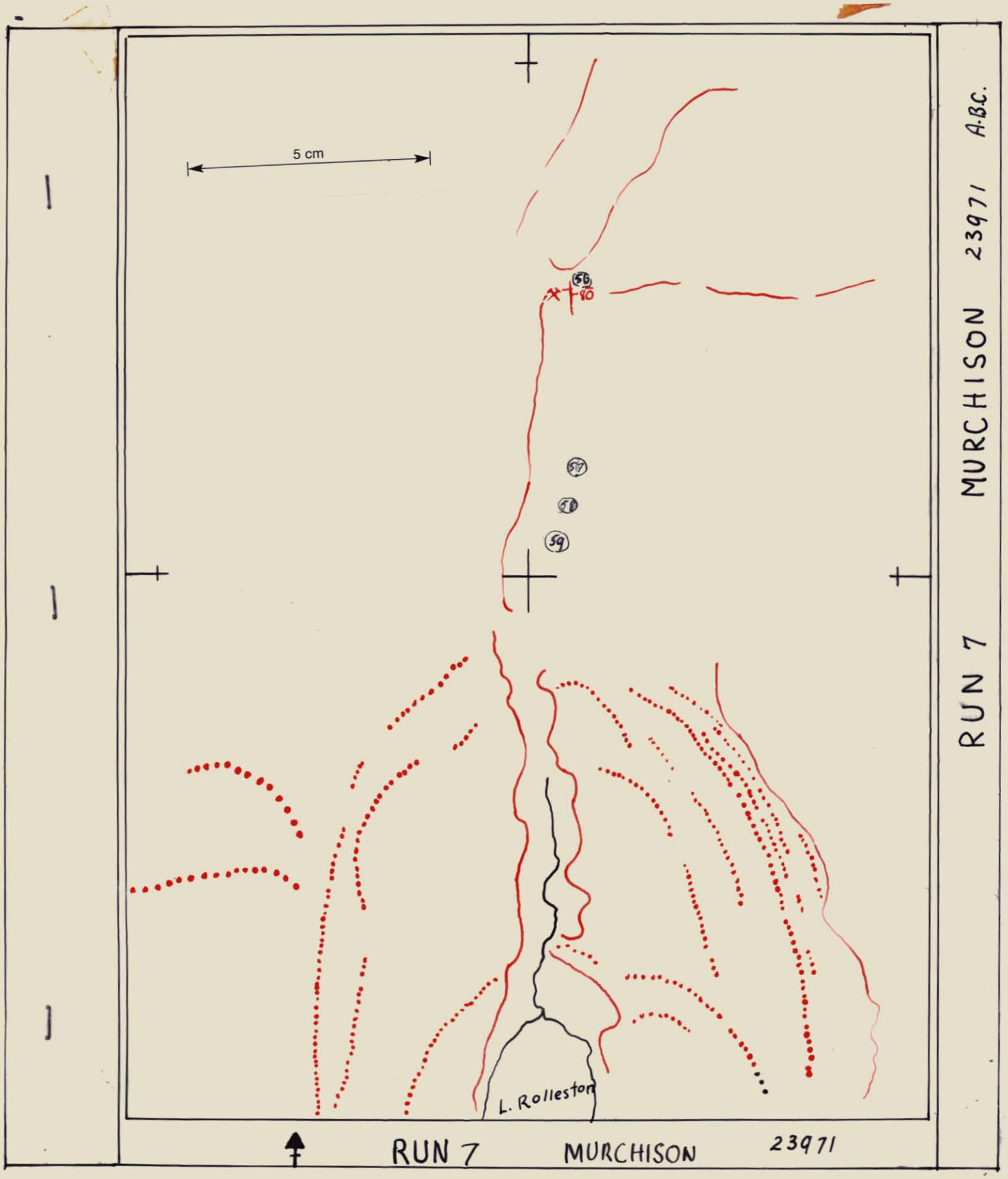
Marchmont Lane ?

2397

MURCHISON 7-23971

008

44611S



(56). Chloritised fine grained quartz porphyry. Adit I50'+ Due S -Fe.

(57). Ditto. Rock (56).

(58). Schitose purple agg?schistosity I50°/80° E.

(59). Schistose quartz porphyry, with haematite rich rock up to I' thick.

...Murchison Run 7 No 2397I A.B.C. 446120

(56). Chloritised fine grained quartz porphyry. Adit I50'+ Due S -Fe.

(57). Ditto. Rock (56).

(58). Schitose purple agg?schistosity I50°/80° E.

(59). Schistose quartz porphyry, with haematite rich rock up to I' thick.

16/4/57. A.B.C.

56. Chloritised f.g. quartz porp. Adit 150' + Due S – Fe.
57. Ditto. Rock 56
58. Schistose purple agg.? Schistosity 150/80°E
59 Schistose Quartz porphy. with hematit. rich rock ulp to 1' thick

. 56

. 57

. 58

. 59

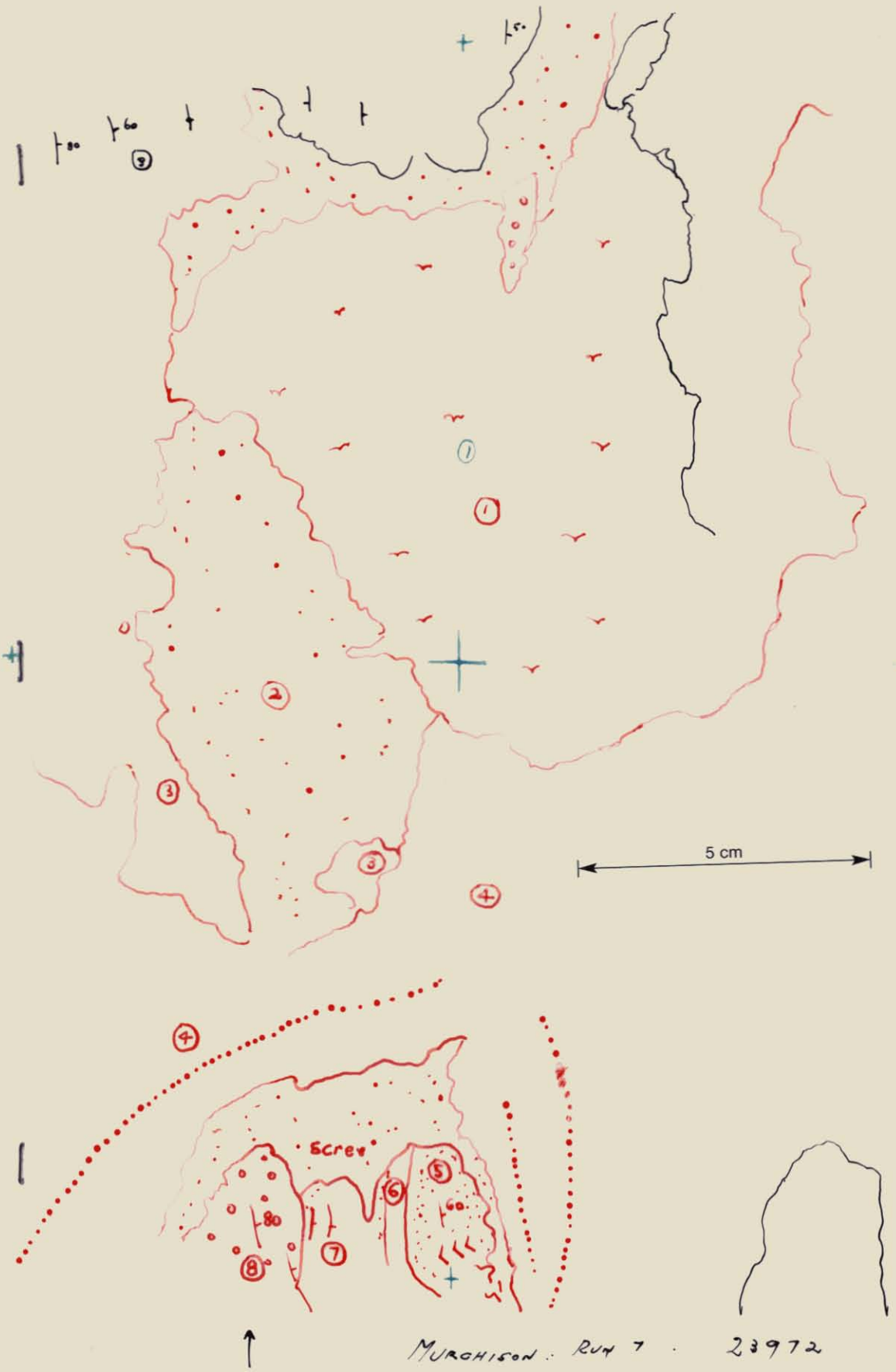
23971

[illegible]

MURCHISON 7— 23972

012

446122



446123

013

① Alluvial swamp : silted glacial lake?
② Scree
③ Gravelly Conglomerate
④ Glacial : lateral and frontal moraines.
} B.C. III/1957

⑤ Deep-purple micro-breccia : fragments of milky quartz, purple cherts, dark blue limey rocks & hematite, embedded in ~~sandy~~ purplish to dark quartzitic matrix. Poor sorting and strong cross-bedding. Fragments from 2- to 20 mm., mostly angular or subangular. Weathering off dark blue limey fragments, leaving holes on exposed surfaces.

RIO AUSTRALIA EXPLORATION PTY. LTD.

⑥ Dense, white, sugary quartzite : clastic grains up to 5 mm., some larger.

⑦ as ⑤, with prominent cross-bedding and rich hematitic layers near base. Rests with marked angular unconformity (10-15°) on (photographs)

⑧ Coarse, pinkish to light-coloured conglomerate, with pebbles and cobbles up to 6" across. Chiefly cleaved quartzite and dense siliceous structureless quartzite. Almost without cementing matrix. Perfectly washed from fine material but thouroughly ~~unsorted~~ unstratified. Pebbles well rounded ~~and~~ or subangular

Relations between ⑦ and ⑧, as observed: 23972

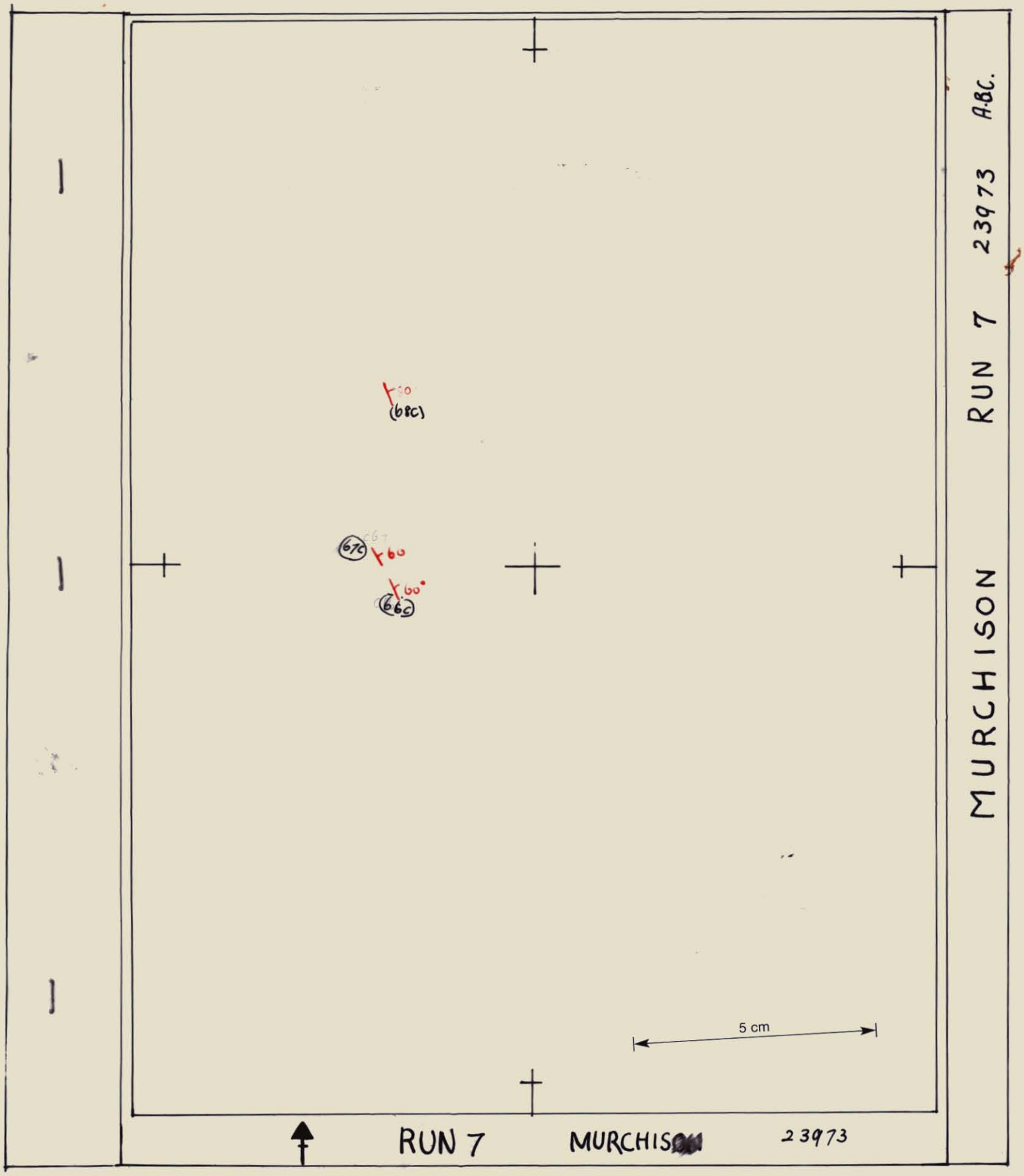
Middle Owen ← ↑ Lower Owen ?

B.C. & D.K.
II/1958

Murchison Run 7.

014

446124


RUN 7 23973 A.B.C.
MURCHISON
(68C)
(67C)
(66C)
5 cm
RUN 7
MURCHISON
23973

015 Murchison Run 7 No 23973 A.B.C.

(C66). Section Siltstones. S.S. pebbles congpomerate and felspar pebbles 700' - I65°/70° E.

(C67). Pebble conglomerate (quartz-sorted) I40°/60° NE.

(68C). " " " " I25°/80° NE.

Murchison Run 7 No 23973 A.B.C.

(C66). Oo Section Siltstones. S.S. pebbles congpomerate and felspar pebbles 700' - I65°/70° E.

(C67). Pebble conglomerate (quartz-sorted) I40°/60° NE.

(68C). " " " " I25°/80° NE.

017

446126

A.B.C. 20/3/67 – ½ (C68 – C66)

C66. Oo Section Siltstones, S.S. pebble conglomerate, +jasper pebbles 700ft – 165°/70°E
C67 Pebble conglomerate (quartz-sorted) 140/60°NE
C68 " " 125/80°NE

.C68

.C67

.C66

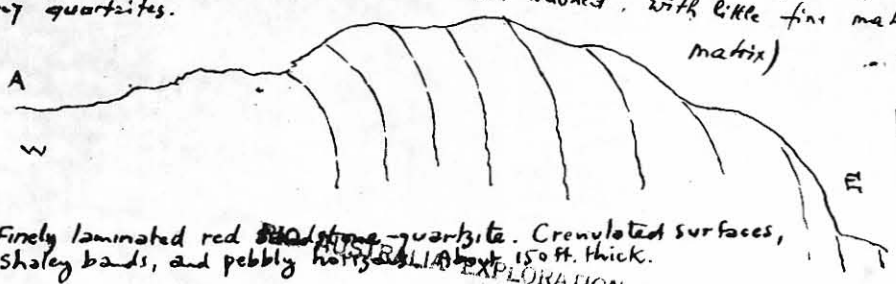
MURCHISON 7- 23974

018

446127

MURCHISON · RUN (7) · 23974

① Gravelly conglomeratic layers, with occasional pebbly quartzites, grey & chocolate coloured.
② Pebbly quartzites, predominantly grey and coarse grained.
③ Pink-white cobbley conglomerate: pebbles of grey schistose quartzite and pink flinty massive quartzite, always poorly sorted but well washed, with little fine material (siliceous matrix)
④ Purple quartzite, well bedded.
⑤ Grey quartzites.



④a Finely laminated red sandstone-quartzite. Crenulated surfaces, shaley bands, and pebbly horizons. About 150 ft. thick.

⑥ Well bedded grey slatey siltstone, bladed outcrops, generally poorly exposed.

⑦ Conglomerate. Generally white in colour but with some pink quartz pebbles. Interbedded grey S.S. layers, and overlain by 60 ft. of grey SS. with scattered pebbles followed by a second band of white cobble conglomerate.

⑧ Alternating layers of well bedded red sandstone and conglomerate type ③ above. Total thickness about 300 ft, each layer about 20 ft.

⑨ Sequence of predominantly grey quartzites and slatey quartzites (type 5), with few pebble conglomerate bands, and pebbly quartzite bands.

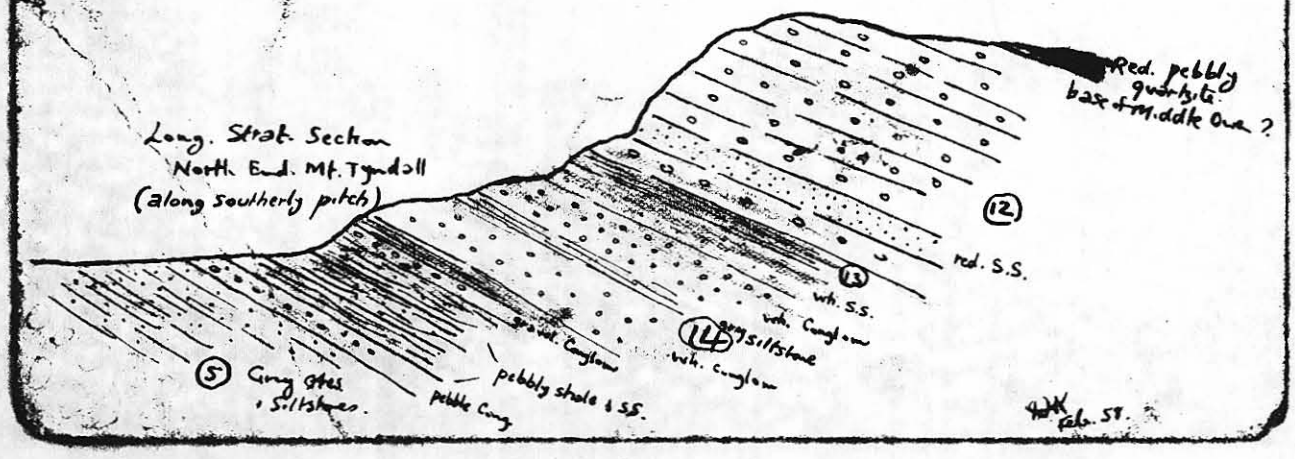
⑩ Grey quartzite with grit bands.

---

⑪ White cobble conglomerate with interbedded white sandstone bands.

⑫ Massive conglom. of Mt. Tyndall.

⑬ Well laminated grey purple siltstones, forming bladed outcrops. Contains few small pebbles.



Murchison Run 1.

MURCHISON 7- 23975

020

446129

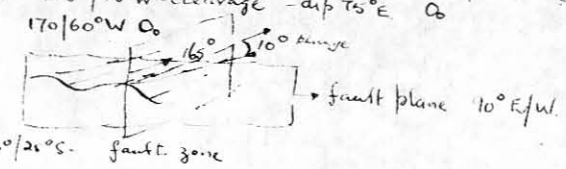
MURCHISON . RUN (7) · 23975

021

446130

A.B.C 20/3/57

C58. Grey massive rock - med. g groundmass (Quartz grains) + pebbles lava, jasper + quartz - Dukes.? 160/45°W - faulted?
C59 Medium grained variation of red felsite 160/65°E
C60 Coarse to medium grained pebble (quartz Conglomerate) Oo 160/65°E
C61/61 Ditto 60 + grey siltstone 115°/45°W ; C62 ditto 61 150/80°W Oo
C63 Coarse pebble conglomerate 3° 95/35°S.E. — 64 — 145°/30°S.E.
C65 Quartz Reef - crystalline 135° + floaters of veined Co quartz S.S.
C66 Oo Section - Siltstone S.S. pebble Congl jasper pebbles 100' - 165°/70°E (Mur T-23973)
C69 f.g. fissile siltstone grey. 145°/45°W - cleavage - dip 75°E Oo
C70 f.g. sorted quartz S.S 170/60°W Oo
C71 ditto C70 170°/60°E.
C72 Flat roll of Owen S.S



thence strike swings 120°/25°S. fault zone

C73. f.g. massive quartz S.S Oo 105°/10°W (C72-73 - on fault zone)

① Basal Owen. Especially poorly sorted, some very large boulders up to 8 inches, white sandy matrix. Overlies Breccia.

② White cobble conglomerate. C69

③ Massive pink conglomerate of Mt. Tyndall. Bands of red sandstone near base.

④ Grey quartzites, pebbly shaley quartzite and thin conglomerate (pebble) bands.

23975

C70 C71

C65 C72 C73

C60 C58 C59

C64

C62 C61

C63

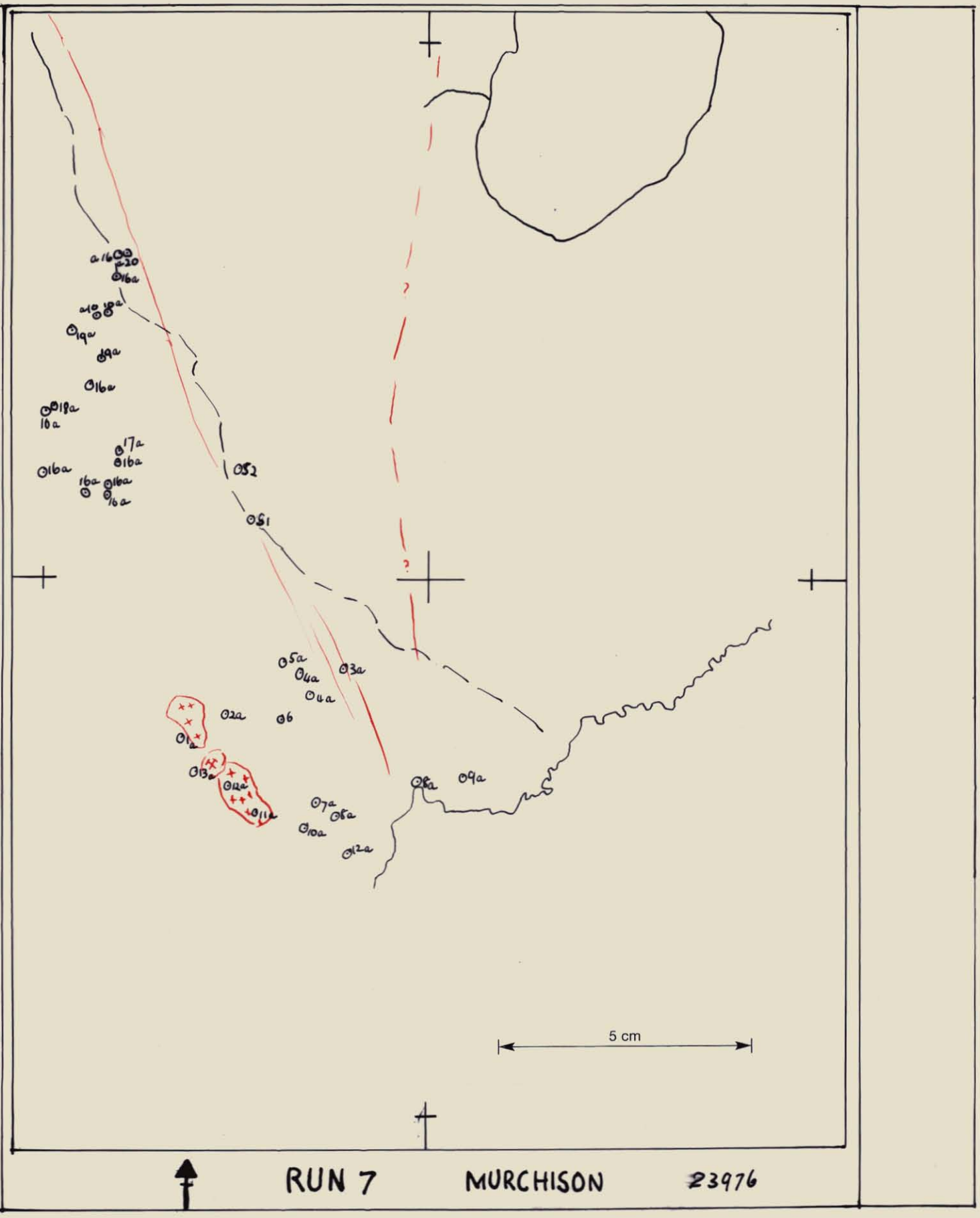
Murchison Run 7.

MURCHISON 7- 23976

022

446131

MURCHISON RUN 7 23976 W.J.A.



446132

SI. Jukes Breccia.

S2. Owen conglomerate.

.....

AI. "Quartz trachyite" f.g. felsite. gm, with quartz phenocrysts. (=cI).

A2. Glacial deposits.

A3. Jukes Breccia. 315°/70° W (Lower formation of Ordovician) =AI4.

A4. Pink felsite, near contact with Ordovician.

A5. Quartzose rock, fine medium grained. May be felspathsed sediment.

A6. Felsite, silicified glass in groundmass. Cherty material.

A7. Felsite-mottledgreen and pink.

A8. Contact felsite with Jukes Breccia.

Aq. Shearing of quartzite.

AI0. Green porphyroid (= C39 silfelsitic).

AI1. Green porphyroid (pink weathered) C39.

AI2 Contact AI with felsites.

AI3. Old mine shaft.

AI6. Green porphyroid-pink felspar and quartz phenocrysts, dhistose, weathering pattern. Green groundmass.

AI7. Green porphyroid (AI6) Silicified with cherty and fine grained fragments.

(AI6). Aug. 325°/75° E.

(AI8). Schistosity 220/70W in AI6.

AI9. Ged felsite porpyry.

A20. Felspathized.

Murchison Run 7 No 23976 J.Shields & W.J.A.

446133

SI. Jukes Breccia.

S2. Owen conglomerate.

.....

AI. "Quartz trachyite" f.g. felsite.gm, with quartz phenocrysts. (=cI).

A2. Glacial deposits.

A3. Jukes Breccia. 315°/70° W (Lower formation of Ordovician) =AI4.

A4. Pink felsite, near contact with Ordovician.

A5. Quartzose rock, fine medium grained. May be felspathsed sediment.

A6. Felsite, silicified glass in groundmass. Cherty material.

A7. Felsite-mottledgreen and pink.

A8. Contact felsite with Jukes Breccia.

Aq. Shearing of quartzite.

AI0. Green porphyroid (= C39 silfelsitic).

AI1. Green porphyroid (pink weathered) C39.

AI2 Contact AI with felsites.

AI3. Old mine shaft.

AI6. Green porphyroid-pink felspar and quartz phenocrysts, dhistose, weathering pattern. Green groundmass.

AI7. Green porphyroid (AI6) Silicified with cherty and fine grained fragments.

(AI6). Aug. 325°/75° E.

(AI8). Schistosity 220/70W in AI6.

AI9. Ged felsite porpyry.

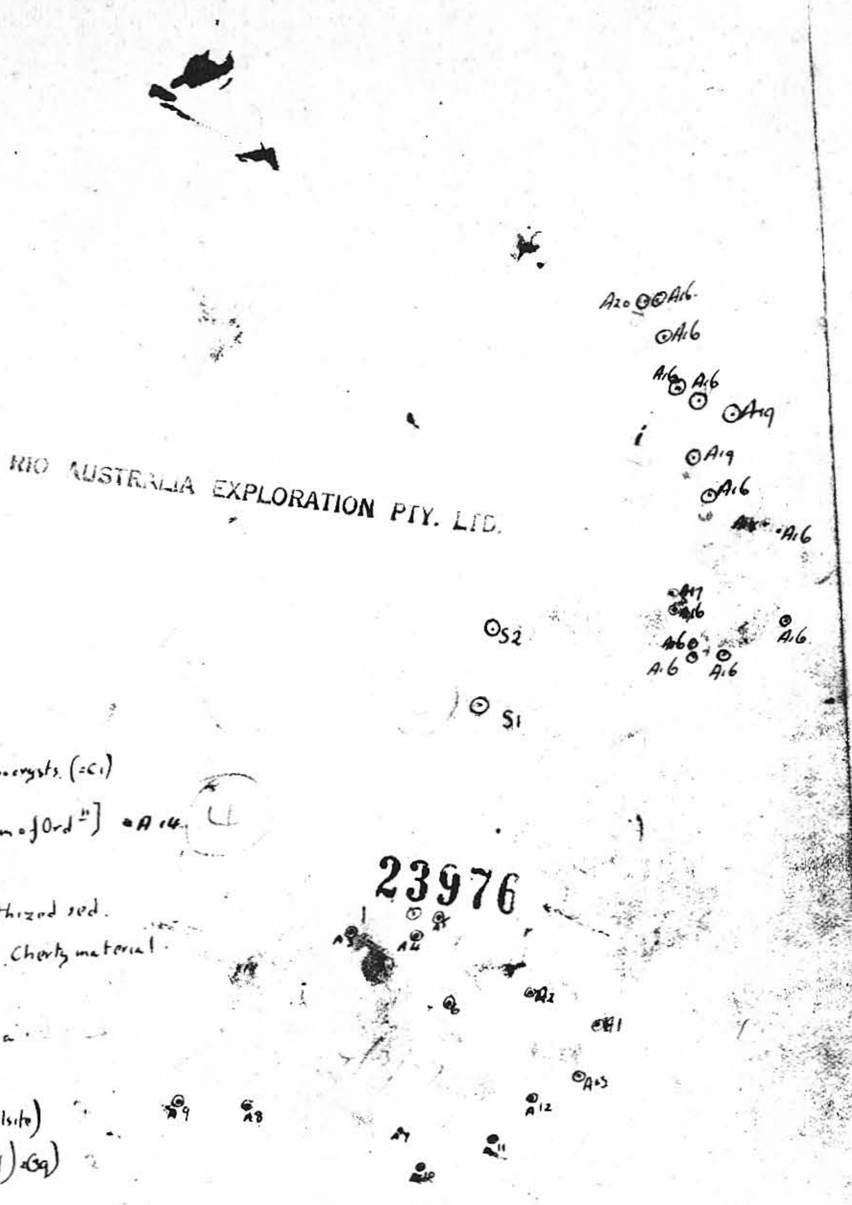
A20. Felspathized.

J.A.
14/3/57
19/3/57

J. Shields

S1 Jukes Breccia

S2 - Owen Conglomerate.



A1. - "Quartz trachyte" - a f.g. felsitic gm. c̄ qtz. phenocrysts. (=C1)

A2. - Glacial deposit.

A3 - Jukes Breccia 315/70 W. [Lower form of Ord.ⁿ] • A 14.

A4 - Pink felsite, near contact c̄ Ordⁿ

A5 - Quartzose rock, f-m. grain. May be felspathized sed.

A6 - Felsite, silicified, glass in g. mass. Cherty material.

A7. Felsite - mottled green and pink.

A8 - Contact felsite c̄ Jukes Breccia.

A9 - Shearing of O. quartzite.

A10 - Green porphyroid (= C 39 Sil felsite)

A11 Green porphyroid (pink weathered) (C39)

A12. Contact A1 c̄ felsite.

A15. Old Mine Shaft.

A16. Green porphyroid - pink felspar & quartz phenocrysts. Schistose weathering pattern. Green g. mass.

A17. Green porphyroid (=A16) Silicified c̄ cherty & f.g. fragments.

A16 Avg 325°/75°E.

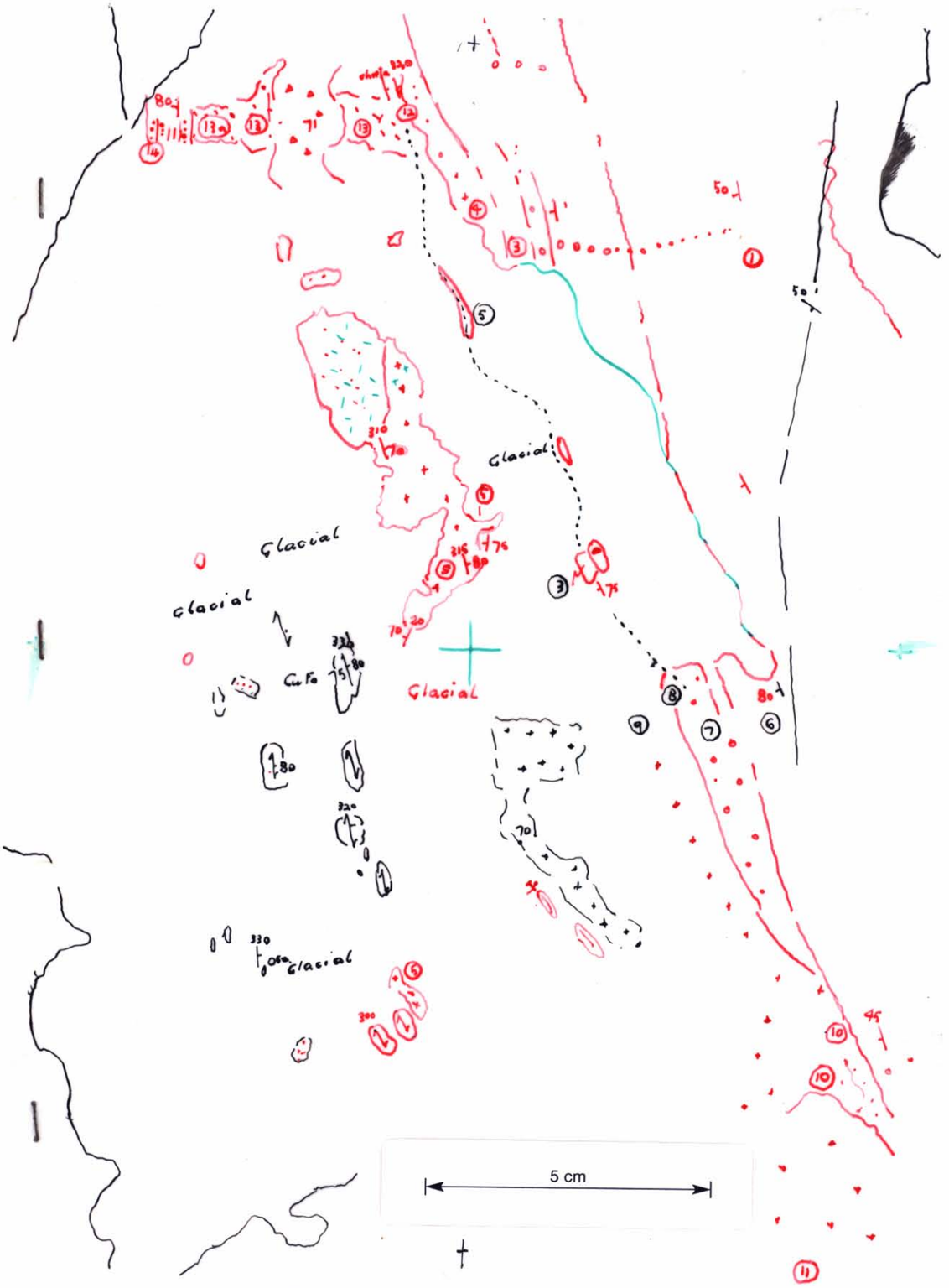
A18 - Schistosity 020°/70W in A16.

A19 - Red felsite porphyry.

A20 - ~~Qtzite~~ ~~or~~ felspathized ? Sed.

Marston Run 7

MURCHISON 1— 23977



MURCHISON - RUN (7) - 23977

027

446136

Murchison Run

W. Atkinson - 18/3/57.
Book 4

A21 - Porphyritic Lava - mauve colouration - Serpentinized?

A22 = A1 = ?Tv.

A23 = A1 325/70 E

A24 = Grey, f.g. dark (lt. basic?) lava. 300/? shistosity.

A25 = Felsite? porphyry. Mottled green & pink - Cherty & fine grained fragments.

A26 = A25 = A27

A28 - Jutes = A14.

A29 - Felsite? porphyry = A25 = Sil. felsite

A30 = A1

A31 - Sil. felsite = A26?

A32 = Green porphyry - Pink felsic quartz phenocryst.

A33 = A1 = A34, A35, A36, A37

A39 = A31?

A39 - Contact. foliated (schistose) green porphyritic lava & A1
Host rock for old lode A13.

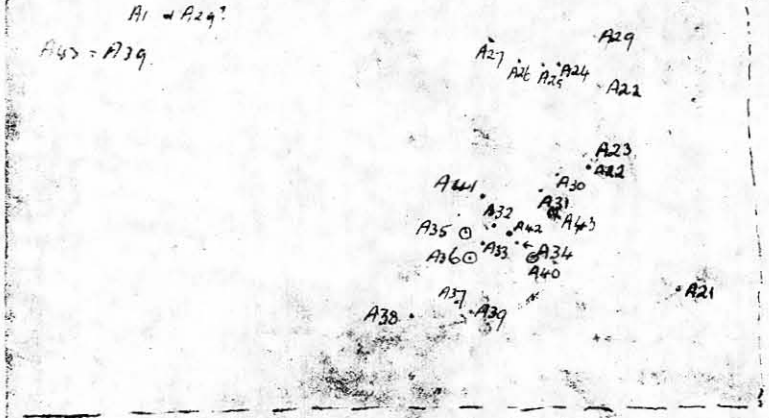
A40 = A39.

23977

A41 = A29

A42 = Contact
A1 & A29?

A43 = A39



D King, M. Shepherd. 16.1.58

12. Agglomerate, similar to but stratigraphically below Red Hill agglom.

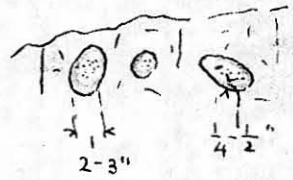
13. Considerable width of microcrystalline white sugary massive felsitic rocks, highly siliceous. Not very stressed. Some incipient crystallisation of phenocrysts. and (1)

13(a) Very siliceous, hard & massive pink & greyish pyroclastic, felsitic. Streaky pink markings. Some limonite patches.

14. Sedimentary sequence consisting mainly of dark grey laminated siliceous slates (2) strike 340°, dip vertical. Interbedded fine (gritty) to medium greywacke agglomerate like those of Dundas area. (3)
chloritic fg: felsite, q/3 phenox & scattered fragmentary inclusions.

Schistose (sericite-chlorite) felsite. Fault zone with rocks similar to those of Lyell Shear. Mineralised

(11) Slightly south of (11): most clear example of pebbles as xenoliths in porphyroidal rock type, showing chilled rims on glacially polished surfaces



(1) Well bedded light coloured quartzite.
(2) Boulder moraine
(3) Mass "Red Hill agglomerate
(4) Pink porphyry (quartz as phenox).
(5) Porphyroidal lava
(6) Grey somewhat schistose (stressed) quartzites
(7) Massive Conglomerate
(8) "Red Hill agglomerate
(9) Porphyroidal lava-looking rock, with large phenox of felspar, set in a microcrystalline green matrix, in irregular alternation with agglomerate lenses, with rapid gradation from massive extrusive rocks to agglomeratic masses. Xenoliths (slates, cherts...) in the porphyroidal lava: suggestive of submarine flows.
(10) Reddish quart-porphyry, much similar to Red Hill porphyritic flow.

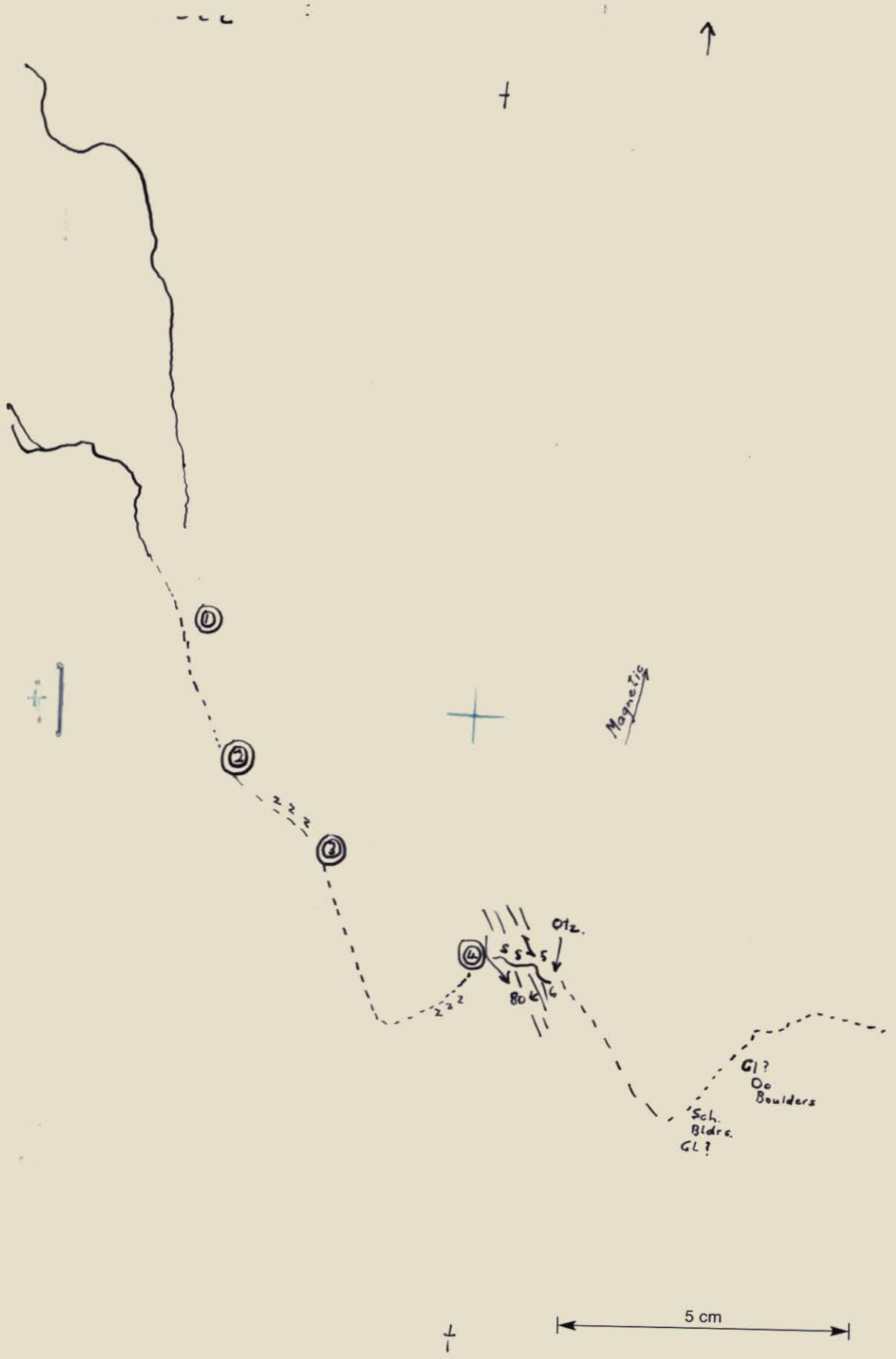
B. Campana 28.III.57

B.C. 3.IV.1957

MURCHISON RUN 8 -23978

028

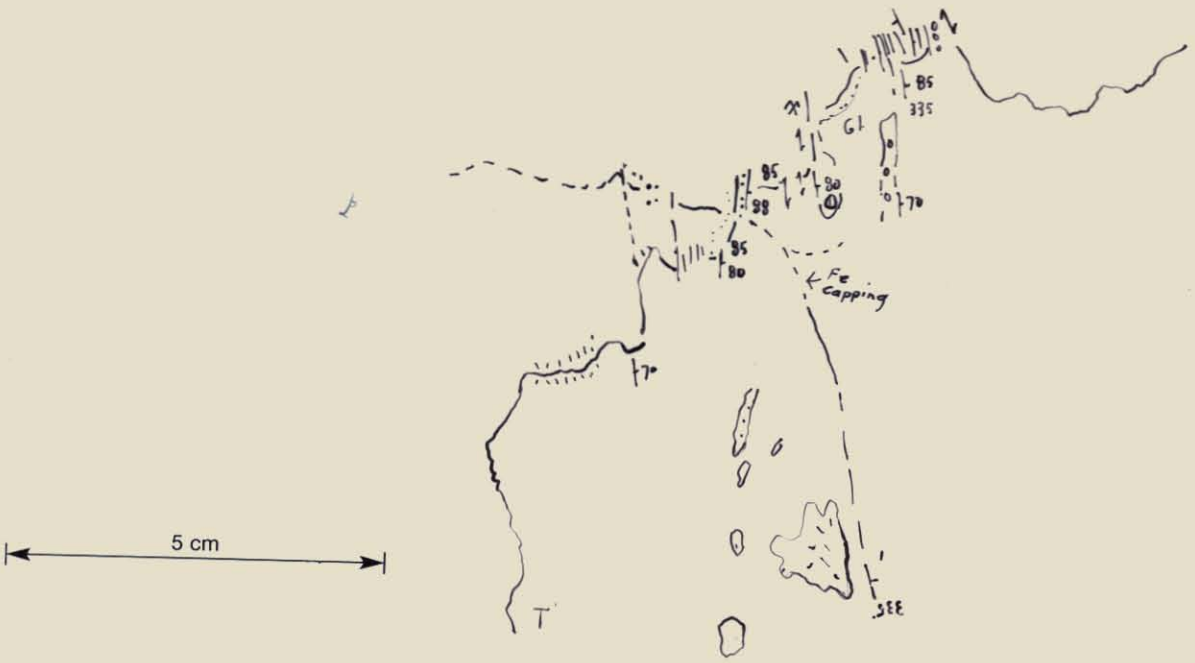
446137



029

MURCHISON RUN 8 — 23979

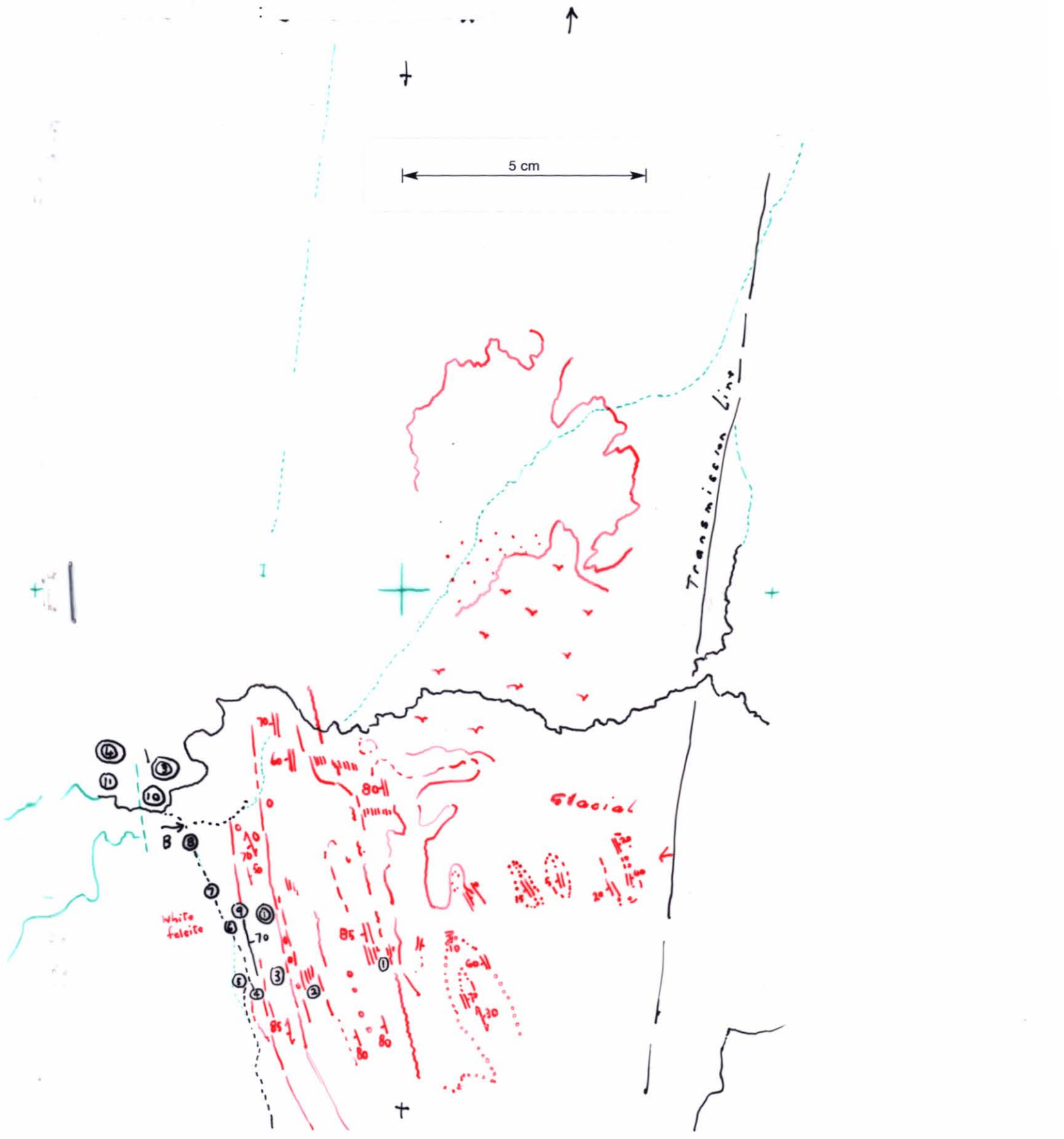
446138



MURCHISON 8-23980

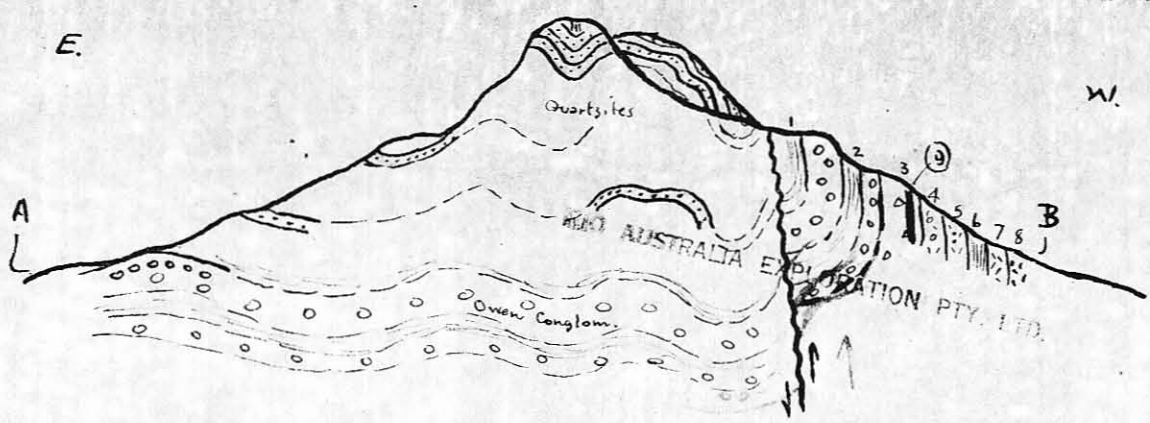
030

446139



031

446140



(1) Finely laminated dark grey shales, sandy shales and sandstones interbedded with basal Owen Conglom.

(2) Similar to 1, but lower in the sequence. (spec. (2))

(3) Agglomerate, as at Red Hill locality (marker). Note apparent conformable relation with Owen Cong.

(4) Pale coloured porphyroidal lavas with scattered large porphyry fragments (agglomeratic).

(5) Pale coloured ?rhyolitic porphyry, fairly massive, with small angular and rounded inclusions (").

(6) Green shales, massive, and appear tuffaceous in places.

(7) White fine grained (microcrystalline) ?rhyolitic lava, with quartz phenocrysts in places, and some rounded inclusions of foreign lava types. Thin intercalations of shale noted.

(8) Dark, greenish lava, agglomeratic in places.

(9) Well bedded sandy - gritty band, with magnetite layers, overlying (4) and overlain by (3). Visible thickness : 20', on a visible length of a few hundred feet (then masked by soil and vegetation at both ~~ends~~ ends). Specimen (1)

23980

(10) Dark green, fine grained extrusive of the Dundas Group, overlying (2) at the intersection of the Henty River with the pack track leading to the west. = specimen (3)

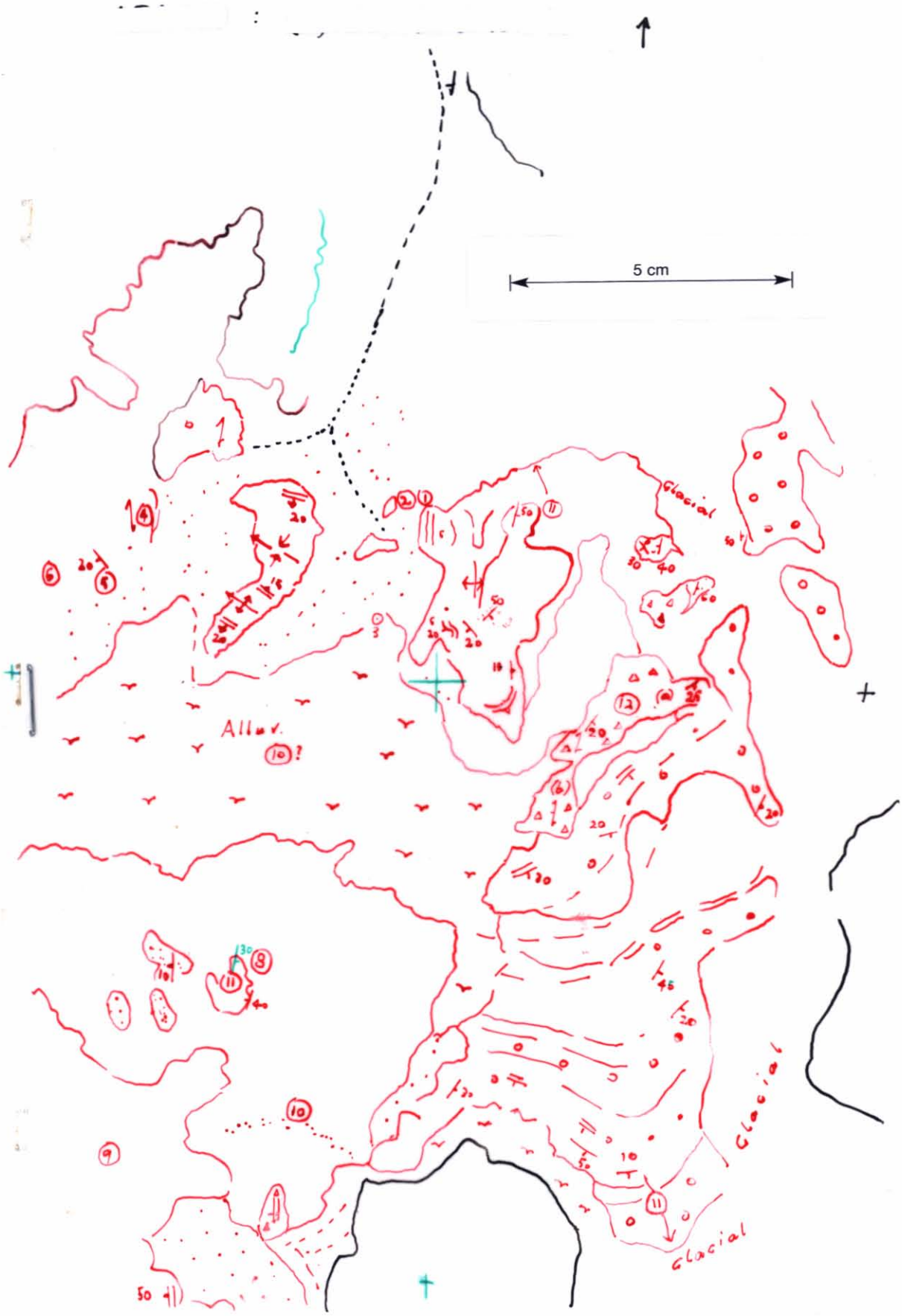
(4) ? Gabbro = specimen (4)

Murchison Rds.

MURCHISON 8-23981

032

446111



033

446142

(1) Stressed and partly brecciated Owen Conglom in and adjacent Creek bed, with fracturing orientated 10° (true) E. of N. Fault Zone

(2) Schistose quartz feldspar porphyry, small outcrop. Probably part of schist group.

(3) Steel hut providing good camp site for four men, H.E.C.

(4) Small o/c of darkish grey ~~shales~~ siliceous slates, with well-developed steep N.-S. cleavage and horiz. bedding.

(5) White friable, sandy shale, small o/c., with platy faces (probably bedding) dipping at low angle to S.W.

(6) Small exposures of qtz. sericite schist.

(7) Light coloured, laminated sandstones

(8) Glacial: boulder moraine with morainic wall in (10)

(9) Light coloured laminated and bedded quartzite, each layer up to 2 feet thick = Upper portion Owen Conglomerate

(10) "Wall" of ? terminal moraine.

(11) ←(10) (11)→ Basal portion of the Owen Conglomerate in anticlinal disposition, with steep pitch to the South.

(12) M. Shepherd. 6th Feb. 1958.

(a) Jukes Breccia — Fine matrix, small Qtz. pebbles and qtz.-porphyry pebbles, rounded and angular. Porphyry pebbles up to 4". Well bedded near top. Pebbles are stressed and flattened.

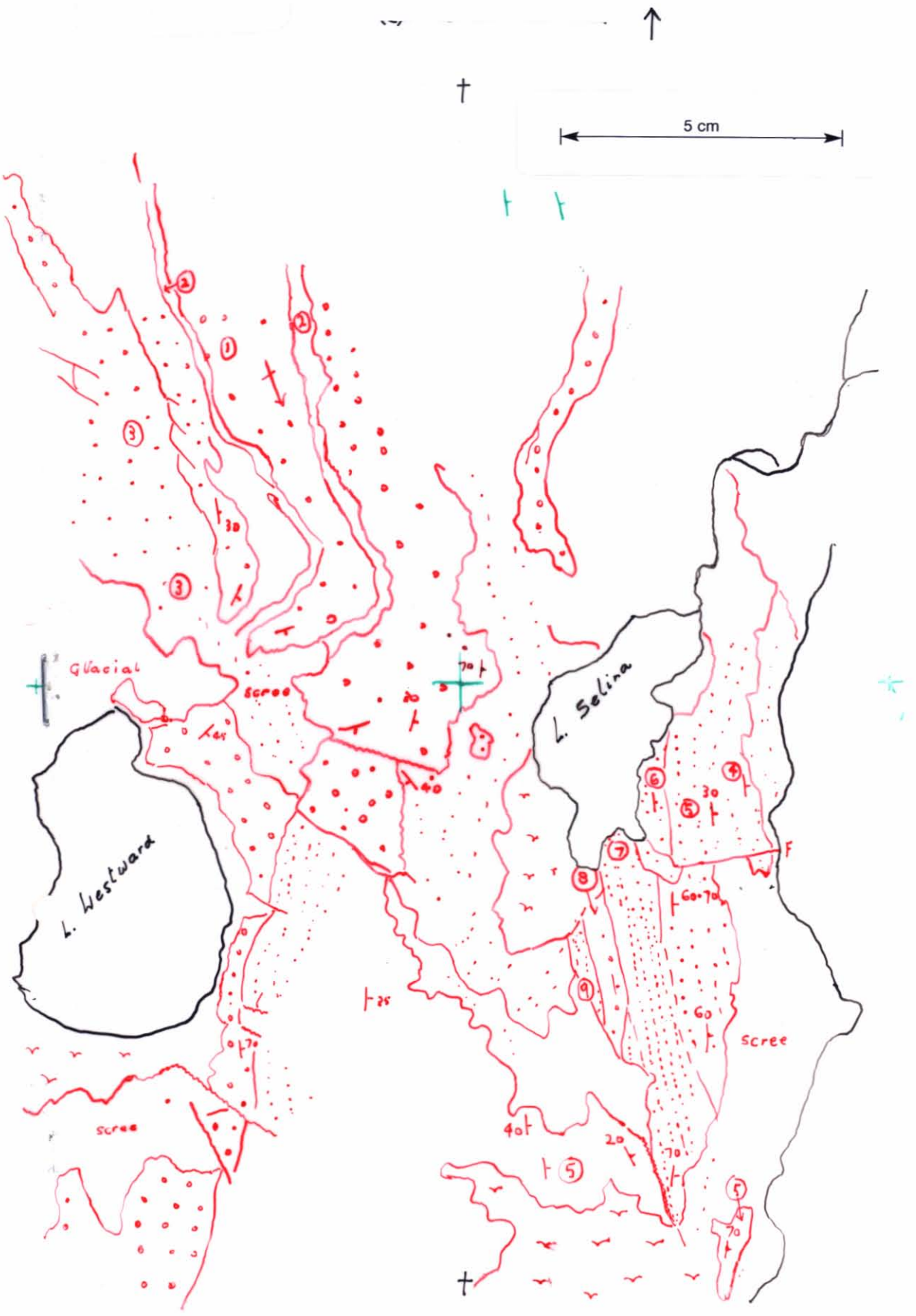
(b) Grey pebbly S.S. well bedded, schistose with Qtz-porphyry pebbles. Qtz-schist, bladed outcrop, qtz. and qtz-porphyry pebbles scattered, contains 1/4" cubes of pyrite.

Murchison Rus.

035

MURCHISON 8 — 23983

446144



446145

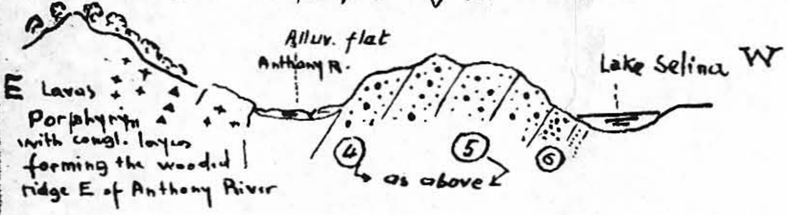
① Owen Conglomerate : Coarse, pebbly-boulder facies (grey)

② " : sandy-pebbly facies (frequently purple and x bedded or well bedded)

③ Scree

④ Fine grained conglomerate, grey-white, pebbles rounded to sub-angular, most of them less than 1" ϕ : quartz, quartzites, cherty pebbles.

⑤ Fine to medium grained conglomerate, with quartzitic gritty layers at intervals. Rapid lithological changes, with quartz, quartzites and cherty pebbles seldom over 1" ϕ. Rounded to sub-angular. In General pinkish-purples tinges.



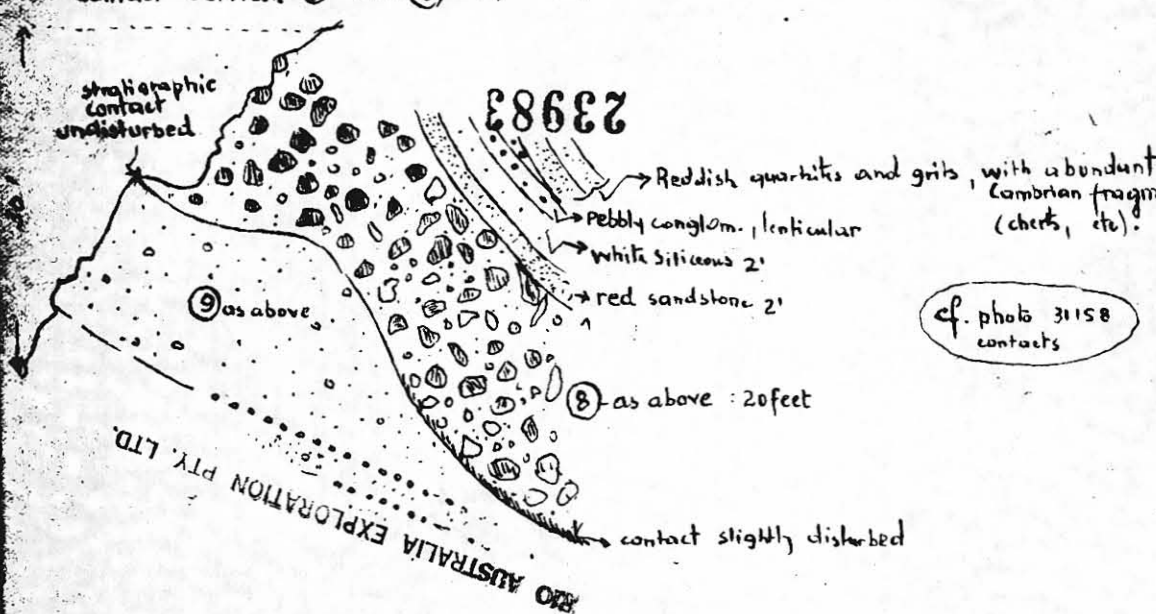
⑥ Coarse gritty layers, grading downwards to pink medium-grained xbedded quartzites
From x bedding features, succession appears normal.

⑦ As ⑥, most of the fragments being of the Cambrian rock types (abundant cherty purples fragments).

⑧ Course Conglomerate : Precambrian quartzites (entirely) as pebbles, cobbles and boulder up to 15" ϕ. Unstratified or very poorly bedded, in thick layers. Thickness 20' } possible basal bed

⑨ Purple pebbly quartzite.

Contact between ⑧ and ⑨ as follows:



23983

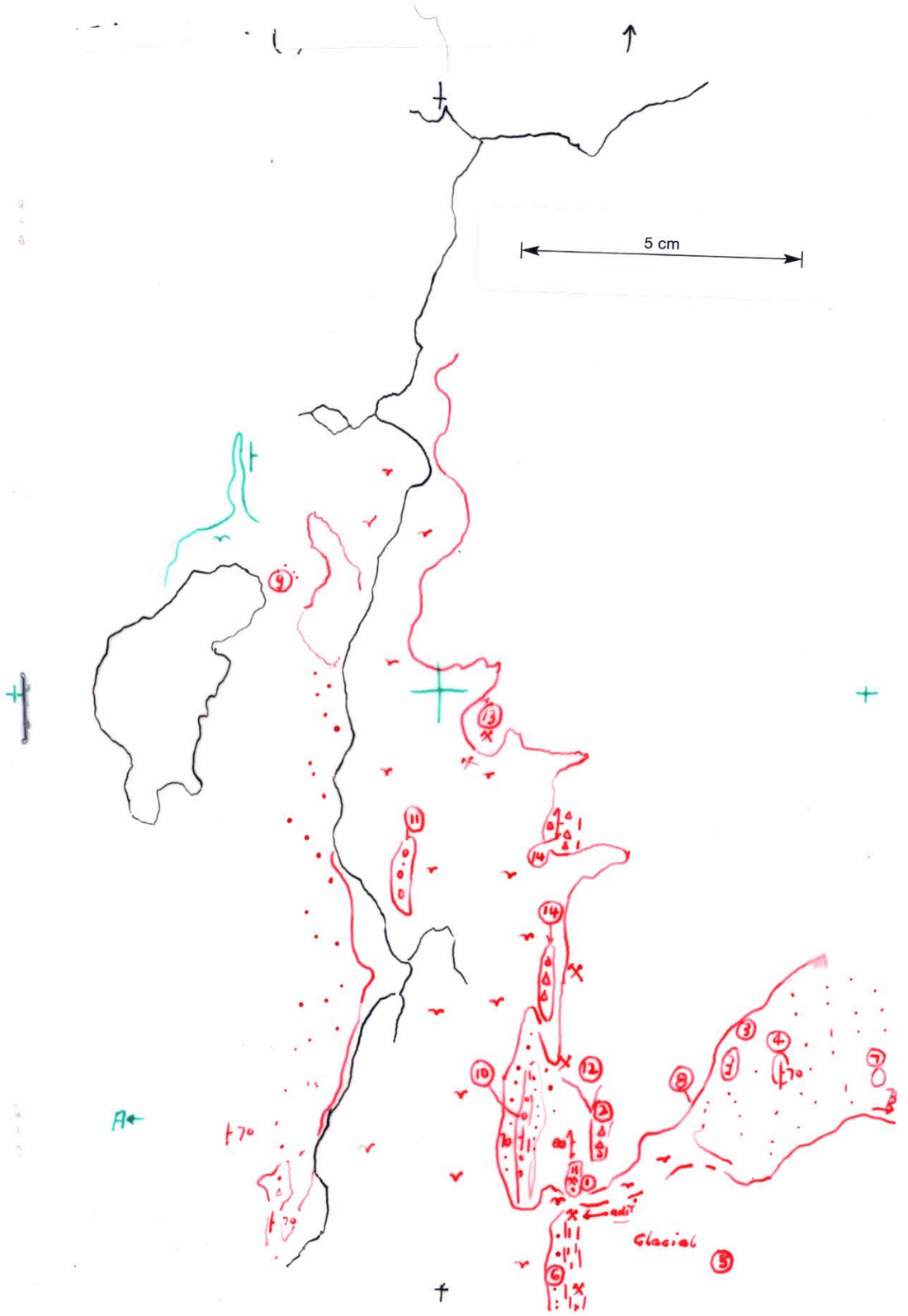
Note: for ①, ② : $\frac{}{35}$ = bedding (in the future the symbol $\vdash_{35}$ will be used instead)

Murchison Run 8.

MURCHISON 8 — 23984

037

446146



038

446147

(1) Dark, basic fg. chloritic lavas, with sparse agglomeratic inclusions, closely resembling Red Hills mineralised host rock. Veins of hematite common, and small workings observed at intervals for half a mile along strike — exposing weak but persistent pyrite-chalcopyrite mineralisation. Also fg. pinkish porphyroidal lavas to east (overlying mineralised zone).

(2) ~~Pale~~ Grey medium grained agglomerate. (Red Hill marker).

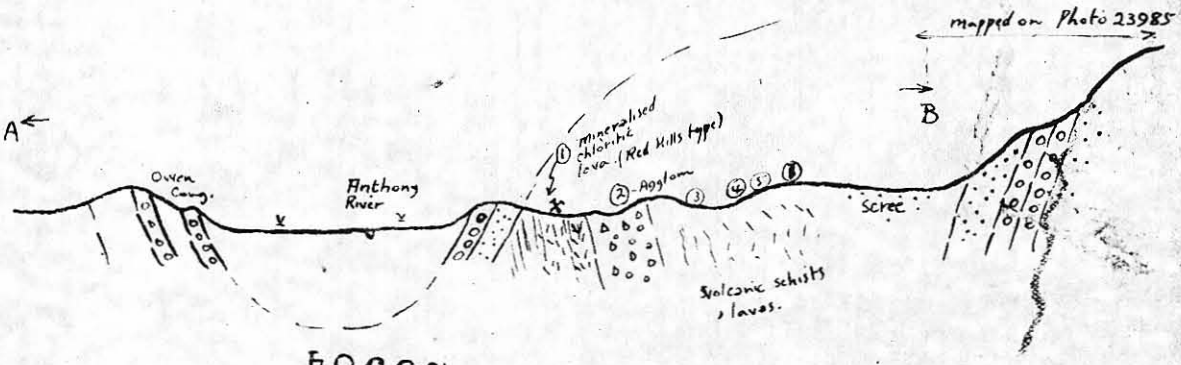
(3) Pale grey volcanic schists with occasional volc. rock 'pebbles'. Closely resemble schists just west of Red Hill.

(4) Grey (light weathering) volcanic schists; banding (probably bedding) dip E. 80°.

(5) Grey fine grained porphyroidal lava. Schistose (similar 4)

(6) Definite bedding in mineralised schists (type (1) above), dip E. 85°. Bedding marked by narrow siliceous band.

(7) Grey schistose porphyroid lava with quartz phenocrysts. (light colour on weathering).



23984

(8) Grey quartz-felspar porphyry. Max. quartz phenocrysts 4 mm diameter.

Supplementary notes:

(2) Pinkish felspar porphyry, occasional quartz crystals; irregular hematite replacement. Probably K-rhyolite. Massive outcrops.

(3) Pale grey sheared felspar porphyries, acicular banding parallels cleavage.

(9) Fine conglomerate and pebbly grits, purple in colour, pebbles 1-2" ϕ 50% sandy matrix. Predominantly quartz pebbly + purply cherty fragments

(10) as (9)

(11) Fine conglomerate, with a layer of white quartzite at top.

(12) Dark green porphyritic lavas, with felspathic streaks and grains. ? Rhyolite. Hematite veins.

(13) Pyritic porphyritic lava.

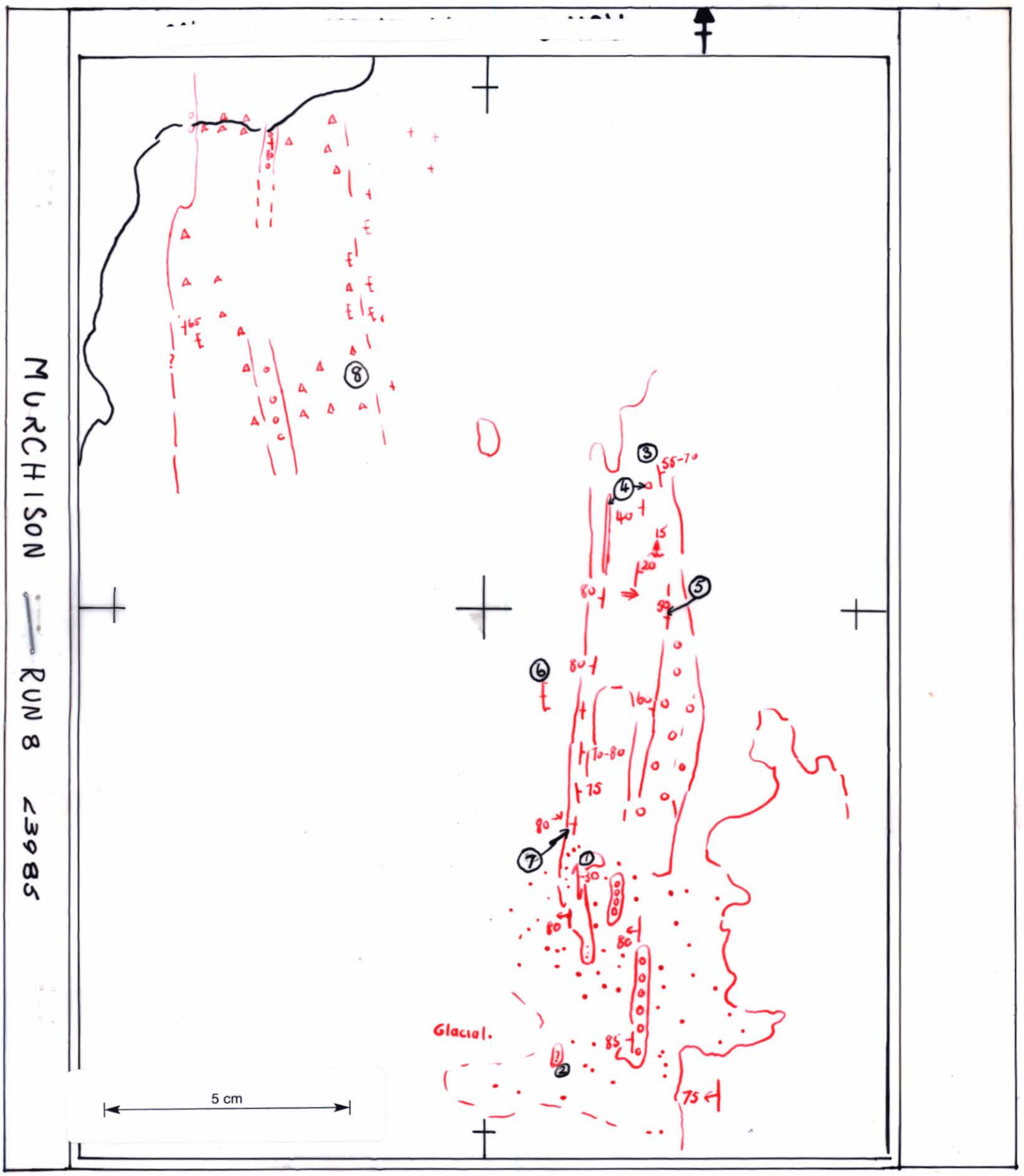
(14) Pebbly layers of the Jacks Breccia facies (interbedded in porphyries ?).

Murchison Rm 8.

MURCHISON 8 — 23985

039

446148



039

940

Murchison Run 8 No 23985

446149

(1). White stressed sandstone with odd pebbles---Baaal Owen Conglomerate

(2). Pink massive porphyroidal lava; interna breccia like structure with fissures filled with chlorite.

(3). Grey-white sandatones, fairly massive; locally finely banded. May have pebblesquartz and locally are fine conglomerates. Crumpled but dominant dip east.

(4). Coarse pink siliceous conglomerate, interbedded with sandstones. Latter often show glassy joint faces like P4.

(5). Finely banded grey sandstone, with some pebbles, overlying pink-grey siliceous medium grained conglomerate.

(6). Medium grey shale with bands of felspathic tuff. Cleavage parallel to bedding.

(7). Medium bedded grey quartzites with minor shale bands.

(8). Innaccessible ridge: appears to be sheared lava with coarse agglomerate bands (or is this Jukes conglomerate).

(1). White stressed sandstone with odd pebbles---Basal Owen Conglomerate

(2). Pink massive porphyroidal lava; interna breccia like structure with fissures filled with chlorite.

(3). Grey-white sandatones, fairly massive; locally finely banded. May have pebbles quartz and locally are fine conglomerates. Crumpled but dominant dip east.

(4). Coarse pink siliceous conglomerate, interbedded with sandstones. Latter often show glassy joint faces like P2.

(5). Finely banded grey sandstone, with some pebbles, overlying pink-grey siliceous medium grained conglomerate.

(6). Medium grey shale with bands of felspathic tuff. Cleavage parallel to bedding.

(7). Medium bedded grey quartzites with minor shale bands.

(8). Innaccessible ridge: appears to be sheared lava with coarse agglomerate bands (or is this Jukes conglomerate).

042

446151

. White stressed sandstone with odd pebbles — -: Basal "Owen Conglom."

2. Pink massive porphyroidal lava; internal breccia-like structure with fissures filled with chlorite.

(3) Grey-white sandstones, fairly massive; locally finely banded. May have pebbles gritty ~~or~~ & locally are fine conglomerates. Crumpled but dominant dip east.

(4) Coarse pink siliceous conglomerate interbedded with sandstones. Latter often show glassy joint faces like PE.

(5) Finely banded grey sandstone, ~~with~~ some pebbles, overlying pink-grey siliceous med. g. conglomerate.

(6) Medium grey shale c̄ bands felspathic tuff. Cleavage parallel to bedding.

(7) Medium bedded grey quartzites with minor shale bands.

(8) Inaccessible ridge: appears to be sheared lava c̄ coarse agglomerate bands (or is this Jukes conglomerate?)

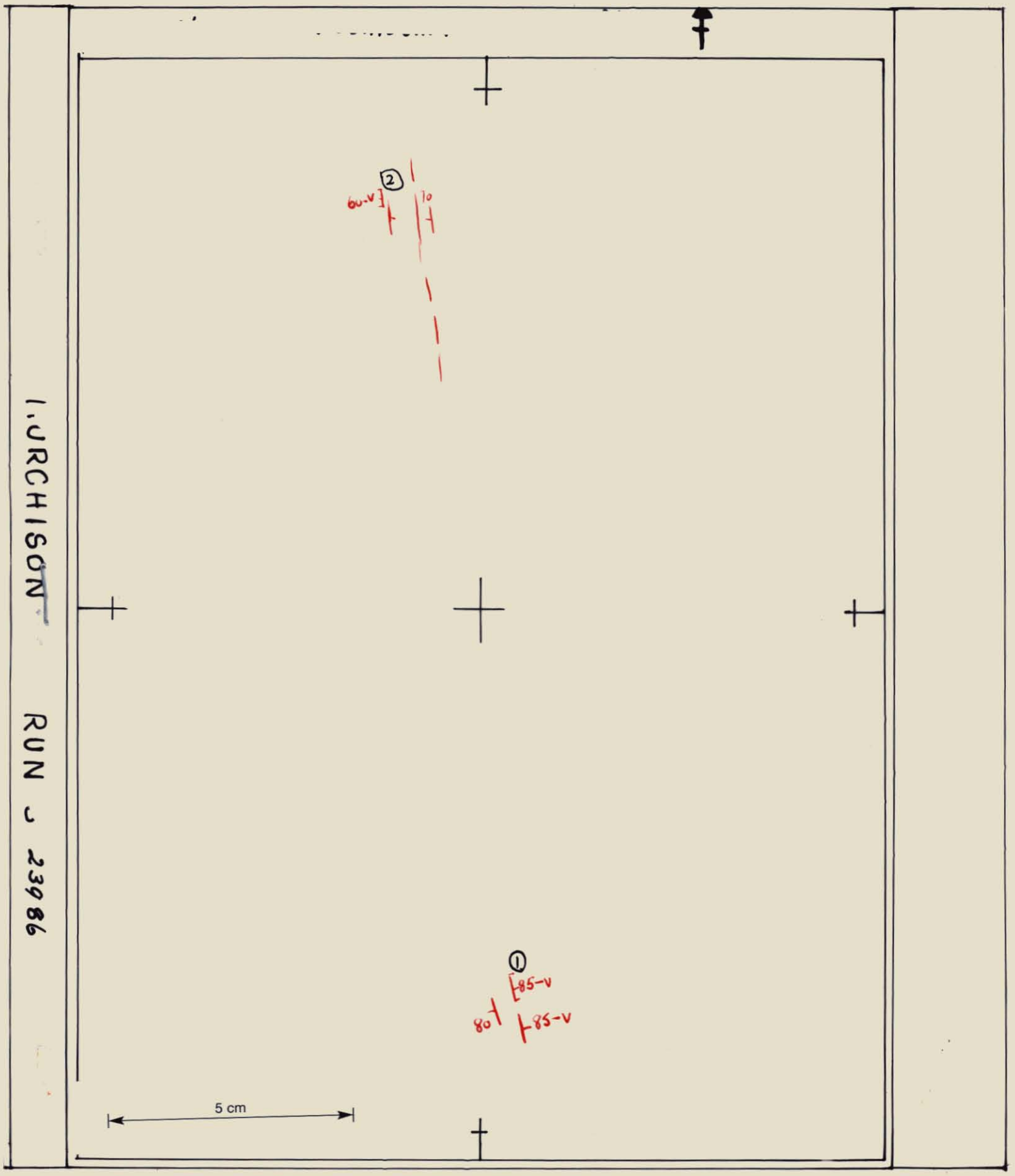
[illegible signature] Rn 8

23985

043

MURCHISON 8 — 23986

446152



043

(I). Sheared siliceous rocks with blebs of quartzs, alternating with metaquartzites, relatively massive, chert layers.

(2). Dark blue-grey, almost graphitic. sheared slates with minor quartzites. Local heavy quartzs veining. Pre-Cambrian (?).

045

Murchison Run 8 No 23986

446154

(I). Sheared siliceous rocks with blebs of quartzs, alternating with metaquartzites, relatively massive, chert layers.

(2). Dark blue-grey, almost graphitic. sheared slates with minor quartzites. Local heavy quartzs veining. Pre-Cambrian (?).

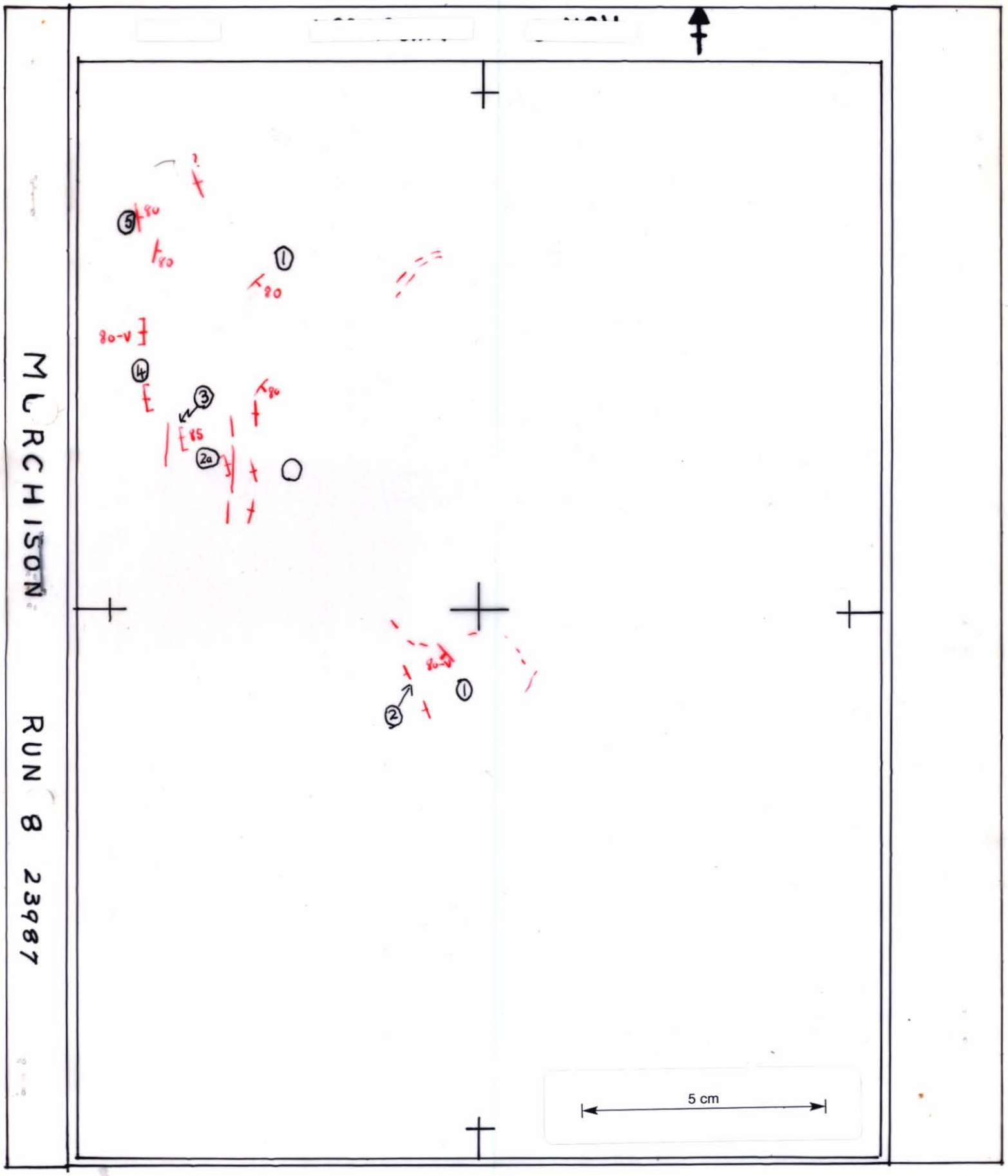
cared siliceous rocks ± blebs quartz, alternating with metaquartzites, relatively massive.

(2) Dark blue-grey, almost graphitic, sheared shales ± minor quartzites. Local heavy quartz veining. Pre Cambrian (?).

MURCHISON 8 — 23987

047

446156



048 Murchison Run 8 No 23987 446157

(1). Pre-Cambrian metaquartzites, well bedded, locally contorted and showing strong axial plane cleavage. Pitch vertical or steep to south.

(2a). Sheared quartzite or quartz schist. Haematite along fractures and disseminated.

(2). Well bedded dark grey siltstone, with paler sandy bands not greater than $\frac{1}{4}$" thick.

(3). Fawn-pale grey quartz sericite schist.

(4). Dark grey sheared shales (slightly pyritic) and sheared quartzites, thinly bedded 160°/vertical.

(5). Highly silicified grey quartzites.

049

Murchison Run 8 No 23987

446158

(1). Pre-Cambrian metaquartzites, well bedded, locally contorted and showing strong axial plane cleavage. Pitch vertical or steep to south.

(2a). Sheared quartzite or quartz schist. Haematite along fractures and disseminated.

(2). 10' bed dark grey siltstone, with paler sandy bands not greater than $\frac{1}{4}$" thick.

(3). Fawn-pale grey quartz sericite schist.

(4). Dark grey sheared shales (slightly pyritic) and sheared quartzites, thinly bedded. 160°/vertical.

(5). Highly silicified grey quartzites.

050

446159

Kings Shepherd 17158

1. Dense brown (light weathering) massive felsitic lava.
2. Dense microcrystalline felsitic type, generally pink colour with dark chlorite segregations.
3. Rhyolite porphyry, similar to 2 but with small quartz and felspar phenocr.
4. Rhyolitic lava, similar to 203.
5. Quartz - chlorite - sericite schist, generally leucocratic, but some darker varieties (6).
7. Fine grained greywacke tuff-agglom. - small creek west of Hendy (resembles gabbro).

23978

(1) PreCambrian melaquartzites, well bedded, locally contorted & showing strong axial plane cleavage. Pitch vertical or skeep to south.

(2) 10' bed dark grey siltstones with paler sandy bands, not greater than ¼" thick

(2a) Sheared quartzite or quartz schist. Hematite along fractures & disseminated

(3) Fawn - pale grey quartz sericite schist

(4) Dark grey sheared shales (slightly pyritc) & sheared quartzites, thinly bedded 160/vertical.

(5) Highly silicified grey quartzites.

Murchison Run 8

57-190

RIO TINTO FIELD WORK

MURCHISON QUADRANGLE 51

Table of Contents - Vol IV

20 CHAIN PHOTOS RUNS 9 – 12 & WEST TIE

446162

	Run No	Photo No	Overlay Finished	Overlay Checked	Field Notes Printed	Field Notes Typed	Field Notes Checked		Compilation Preliminary	Compilation Contour M
IOL IV	9	31154.	✓	✓						✓
		155.	✓	✓	✓					✓
		156.	✓	✓	✓					✓
		157.	✓	✓	✓					✓
		158.	✓	✓	✓					✓
		159.	✓	✓	✓					✓
		31160.	✓	✓	✓					✓
		161.	✓	✓						✓
		162.	✓	✓	✓					✓
		165.	✓	✓						✓
	Unit Tu	26052.	✓	✓						✓
		054.	✓	✓						✓
		056.	✓	✓						✓
		~~058~~	~~+~~							✓
		053.	✓	✓	✓					✓
	10	31170.	✓	✓						✓
—		171.	✓	✓						✓
		172.	✓	✓	✓					✓
		173.	✓	✓	✓					✓
		174.	✓	✓	✓					✓
		175.	✓	✓						✓
		177.	✓	✓						✓
		179.	✓	✓						✓
	11	31267.	✓	✓	✓					✓
		268.	✓	✓	✓					✓
		31272.	✓	✓						✓
		273.	✓	✓						✓
	12	31282.	✓	✓						✓
		284.	✓	✓						✓
		286.	✓	✓						✓

MURCHISON 9 – 31154

090

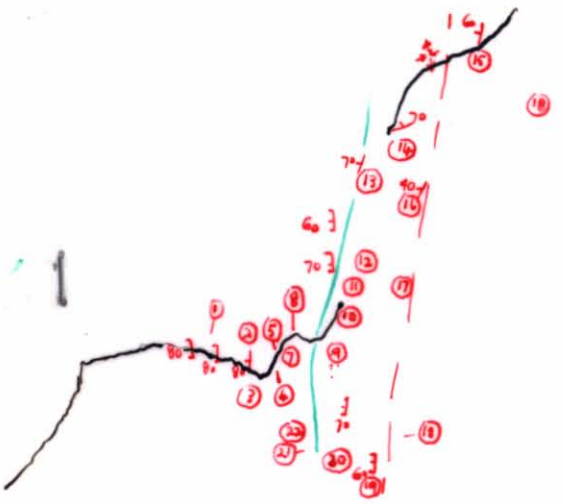
446163

MURCHISON RUN (9) 31154

MURCHISON 9 — 31155

446164

001



5 cm

↑ RUN 9 MURCHISON 31155

9 - 31155

W. Brook. Jan. '59.

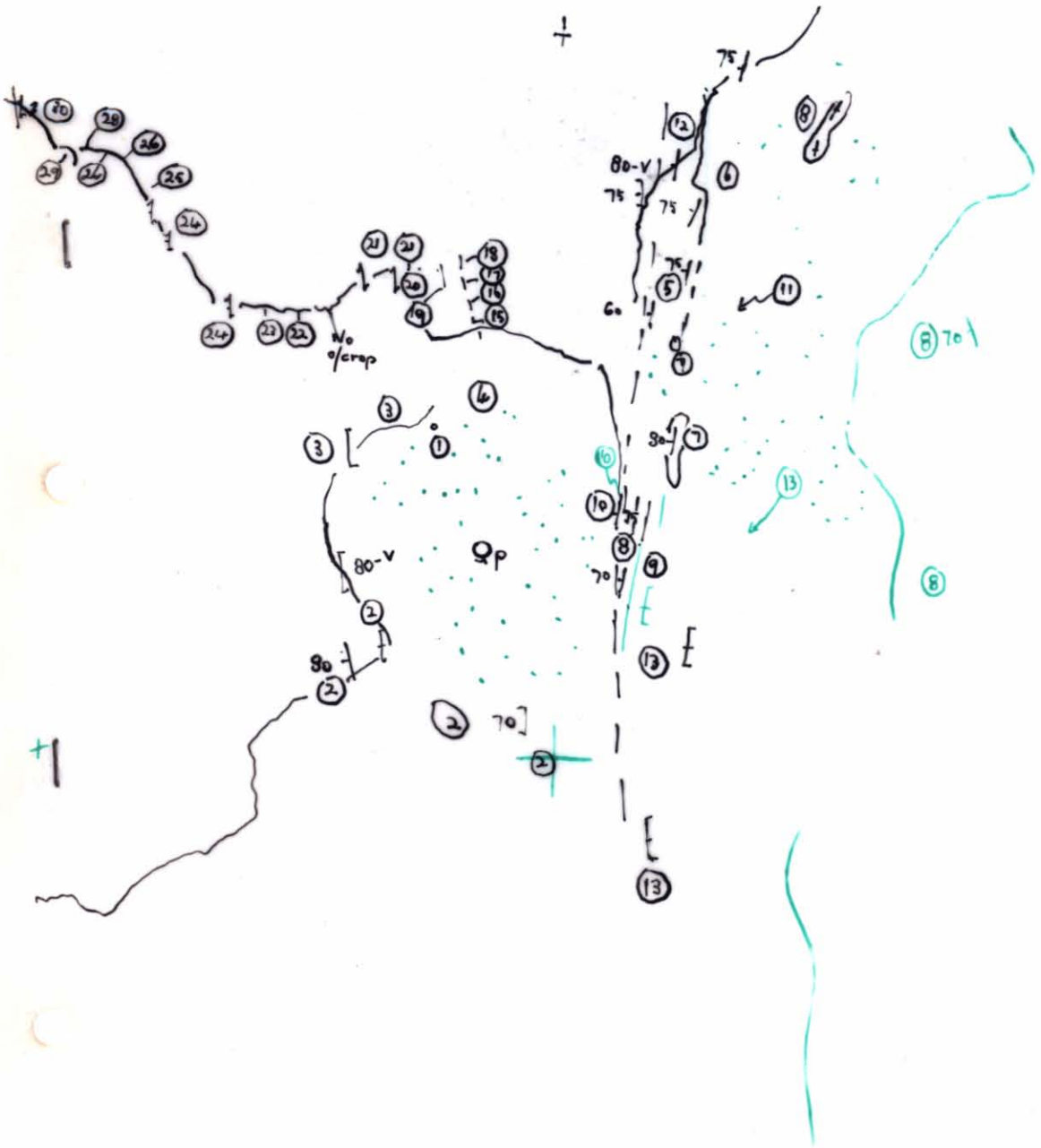
(1) green chloritic sheared brecciated lava.
(2) green chloritic schist with quartz phenocrysts up to 2 mm.
(3) slate-like, micro-crystalline, grey rock (sed.?).
(4) massive grey siliceous rock. (sed.?)
(6) intensive quartz veining in (4)
(7) grey-green chloritic schist - shearing varies in direction 350 - 10°.
(8) hard grey siliceous rock like (4)
(9) 3' band of very sheared grey shale - to east get 20' of grey quartzite, then 4' band of pebbly sheared rock with a feldspathic matrix. Pebbles are rounded & semi-rounded quartz, average size ¼ - ½" with maximum of about 1½".
(10) shearing shows some rolling from 350/80 to 350/60.
(11) fine grained grey schist c̄ mica developed on shearing planes.
(12) chloritic quartz feldspar porphyry - sheared. 350/70
(13) chloritic schist - quartz phenocrysts 4%. - intensive quartz veining
(14) whitish-grey quartzite - probably originally a quartz grit - now almost completely recrystallised. Lumps of sheared carbonaceous slates up to 0.75 cm. are present. 1-5%. Pyritic <0.8%. 10 yds to north get anticline fold axis 340/70 N.
(15) grey micaceous & graphitic schist. - the schistosity shows crenulations & is folded. Bedding // cleavage.
(16) bands of grit, conglomerate & quartzite - maximum pebble size is 3", average is ¼" - generally rounded except for smaller ones
(17) completely unsorted conglomerate lithologically exactly similar to basal Owen, but no porphyry pebbles. Contains boulders up to 2' and an angular grit. About 60% of the pebbles are unsheared quartzites while the rest are sheared and very similar to the Sticht Range quartzite.
(18) white quartzite, completely recrystallised, like (6) Mord. Rsv. 31177
(19) Conglomerate similar to (17) but not as coarse.
(20) Very sheared conglomerate - elongated pebbles - 24" × 3". bands of completely recrystallised quartzite like (18). average pebble size ½ - 1½"
(21) Sheared quartzite - partly recrystallised coarse sand size quartz grains.
(22) Green chloritic schist c̄ 30% quartz phenocrysts up to 1.5 mm.

Rur O Murchison

MURCHISON q- 31156

003

446166



RUN 9 MURCHISON 31156

004

446167

(1) Outcrop(?) on button grass flat. "Outcrop" c. 30'x30'x30'. Coarse-med g. siliceous conglomerate. Quartz veining. Possibly glacial

(2) Pale grey sheared felspar porphyry, locally c̄ quartz phenocrysts up to 2 mm diameter, locally like shales. Local quartz veining. Outcrops fairly massive upstream, judging by one or two boulders, occur quartz-chlorite rocks, indicative of mineralisation (see also staining in Owen Conglomerate cliff).

(3) Similar to (2), but locally quartz phenocrysts dense & up to 5 mm diameter. Widespread quartz-albite veining.

(4) Loose boulders of Owen beds - glacial

(5) Near Anthony river, mainly dark grey shales, which pass eastward & downward (stratigraphically) to pale grey thinly bedded quartzites with minor shale partings. Some fine conglomerate bands like Owen.

(6) Grey sandstone - quartzite & grit, often pebbly or conglomeratic. Locally ¼" pellets of dark shale. Fairly sheared. Owen-like.

(7) Coarse grained breccia-conglomerate (Owen). 300' thick (?).

31156

(8) PreCambrian sheared quartzites.

(9) Dark grey or blue-black shales apparently overlying (?) (7). Local quartz veins c̄ minor pyrite. This may be a facies of formation (5). Heavily sheared.

(10) Dark shales of formation (5) are directly overlain or at least flanked by felspar porphyry, as also seen in Anthony River. Suggests (5) & so called Owen of (7) actually underlie the porphyries.

(11) Fragments of dark blue-grey sheared shales & pale quartzites seen in tree root soil.

(12) Grey sandstone, thin bedded, crumpled near base. Micaceous. Locally conglomeratic, locally with pellets black shale, quartz schist. Local heavy quartz veining.

(13) Blue black shales, sheared & locally crumpled by quartz veins.

(14) Knotted chlorite schist c̄ quartz phenocrysts up to 2 mm. - 30%
also contains rounded quartzite pebbles - average size 1" ϕ.
one rounded quartz porphyry pebble was found.

(15) chlorite schist with no pebbles and less quartz.

(16) more pebbly chloritic schistose rocks c̄ ghost boulders of porphyry
pebbles 9" ϕ in one exposure. - get band of blue grey slate
4" thick. 340/70

(17) disseminated pyrite in pebbly schist zone < 1%
- quartz phenocrysts 20%
chloritic schist c̄ no pebbles

(18) chloritic schist c̄ quartz 160/60

(19) 3' thick vein of quartz

(20) chloritic schist 360/60 W. no quartz

(21) [illegible] recorded in [illegible]

(22) [illegible] of quartz and [illegible]

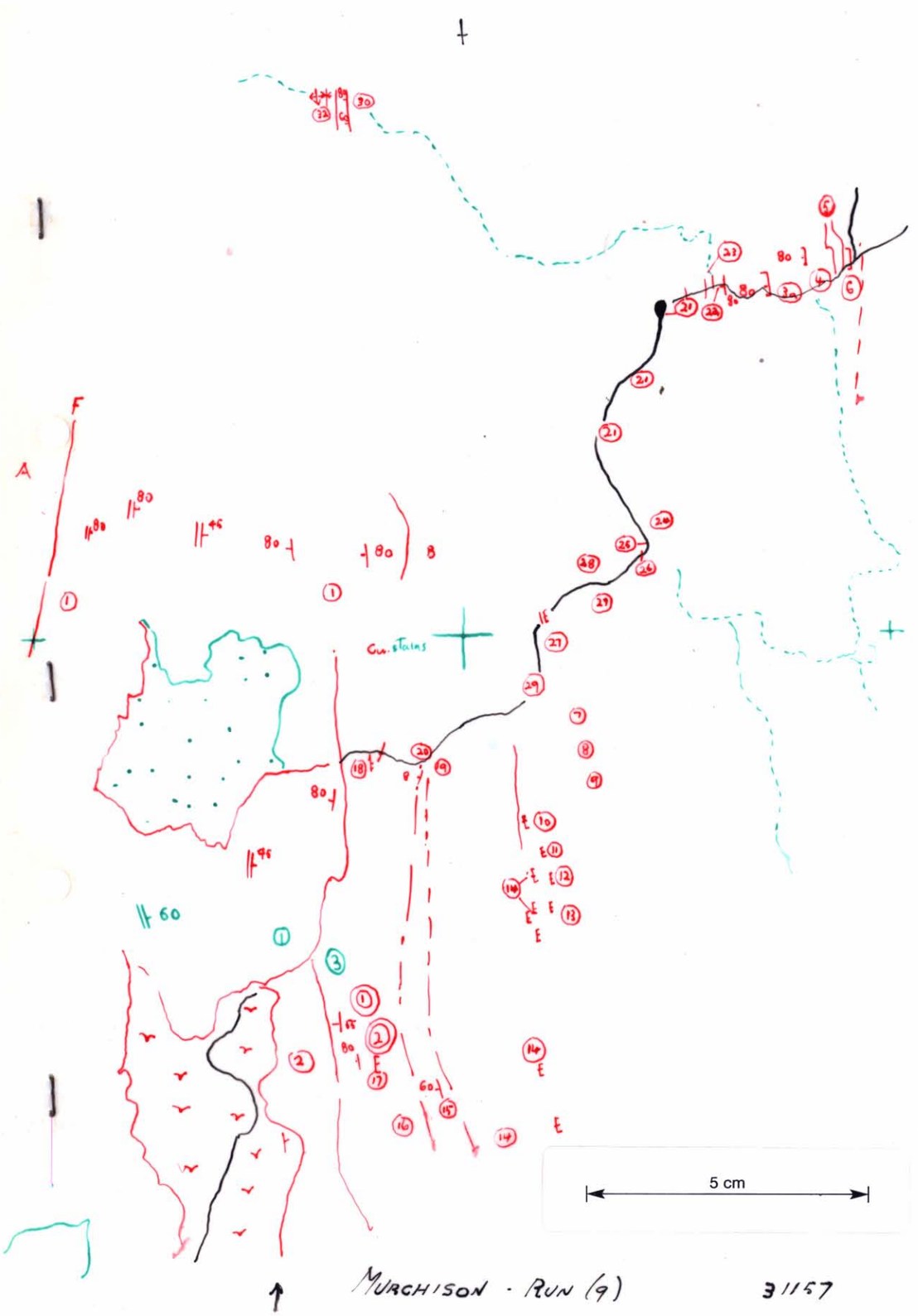
[illegible]

31156. Run 9 Murchison

MURCHISON RUN 9 – 31157

005

446168



MURCHISON · RUN (9) 31157

Murchison Run 9 – 31157

① Owen Conglomerate [illegible] bands of [illegible] conglomerate, with well rounded pebbles up to a few inches ф, and pebbly well laminated reddish-purple grits, the whole showing the following synclinal disposition:

A

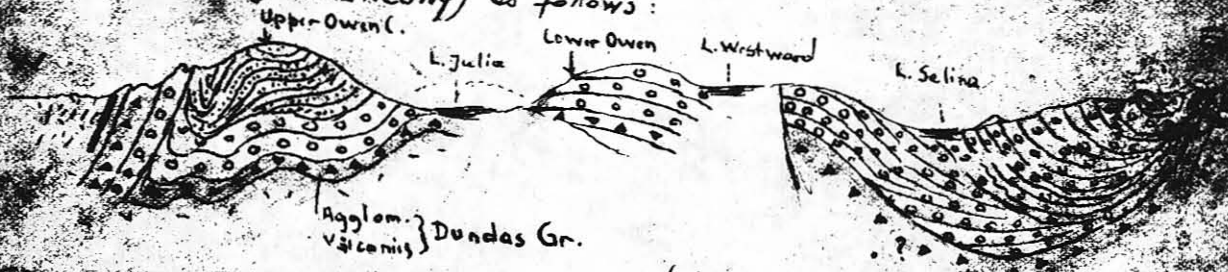
(This area has been revised in March 1958. See photograph 31158 and 31159 Murchison, Run 9)

② Flinty, partly well bedded (laminated), dark green to grey rocks, apparently of volcanic facies (possibly ashen beds), with occasional band of hematite parallel to bedding plane, but also as veinlets across the strike (resegregation phenomena?). Quite comparable to the volcanics of the Dundas Group west of Lake Julia (analogous facies, weathering colour, mode of occurrence).

③ Coarse = Red Hill type "agglomerate" ⓘ with abundant fragments (angular) and pebble (well water worn) of all rock type of the Dundas volcanics (lava, slaty ashen beds, porphyrids, and abundant hematite fragments ② which form in places 10–20% of the rock). This formation is, in this locality, many hundred feet thick and form a steep scarp owing to the almost vertical dip of the beds. It show a dark grey weathering coloration (in striking contrast with the light colour of the Owen Conglomerate, whose facies and petrological composition is very different).

31157

Note: ① (Owen Conglomerate) is here undoubtely transgressive on ① and ③ whose strike and dip form a sharp angle with that of the overlying Conglomerate. ③ is to be correlated with the "agglomerate" at Red Hill and westerly of Lake Julia, the tectonic disposition being (diagrammatically) as follows:



③a Sheared grey felspar porphyry c̄ quartz-albite veining locally pseudo-brecciated.

④ Sheared fine g. quartzite (?) & micaceous slightly impure sandstone. Heavy quartz veining. Thin beds look like quartz porphyry. Cleavage obscures bedding

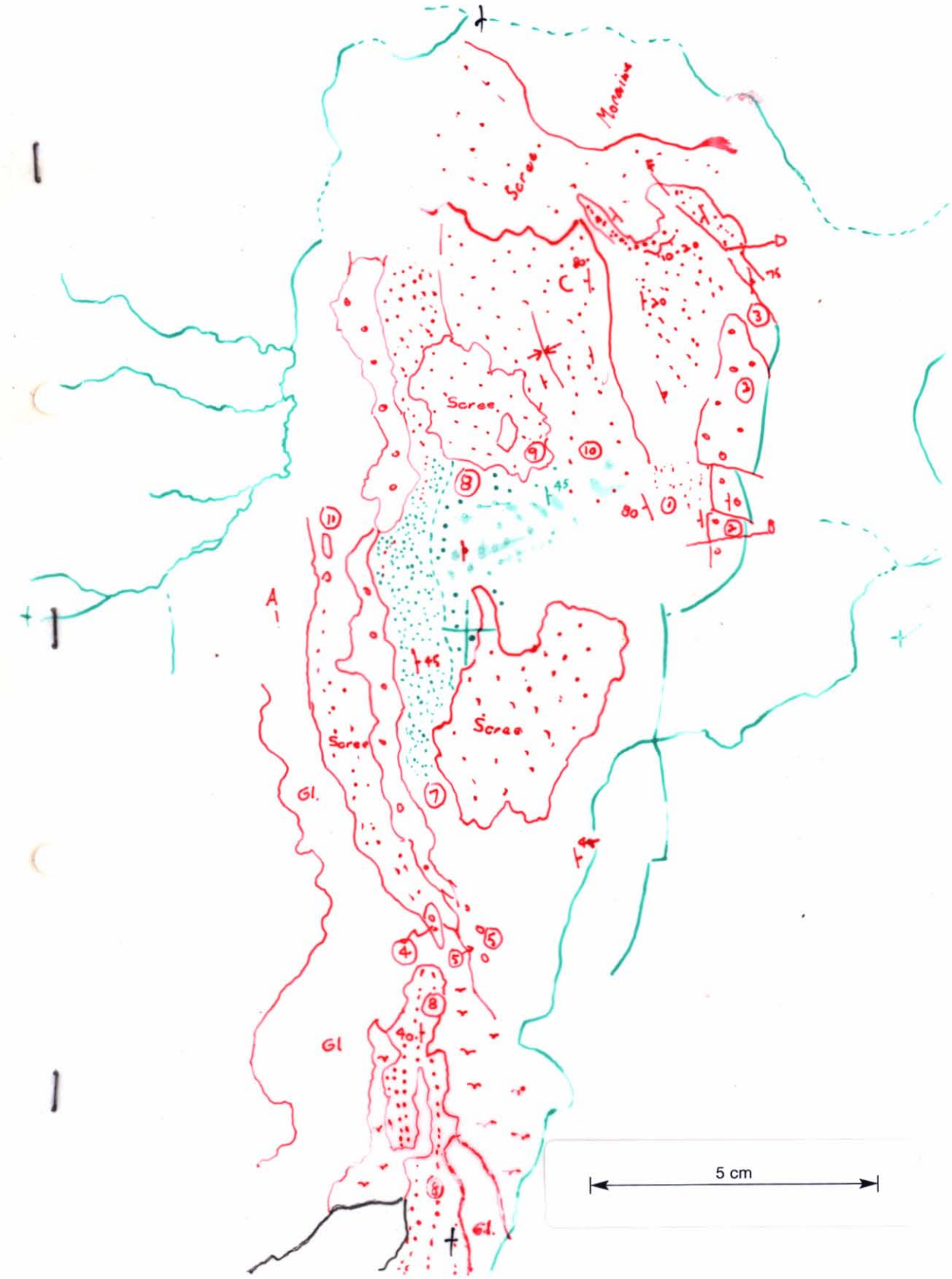
⑤ Near eastern edge sheared sandstones: bedding more obvious.

Murchison
Run 10

MURCHISON 9 – 31158

007

446170



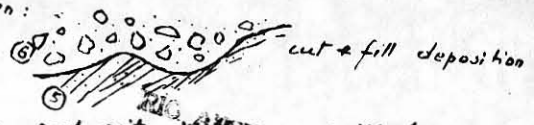
↑ RUN 9 MURCHISON 31158

008

446171

① Bedded purple quartzite (sub-angular)
② Coarse conglomerate: grey quartzite and dense siliceous, pinkish-stained (rounded) pebble, cobble and boulder (up to 1' ϕ). Basal type conglomerate.
③ Massive quartzite, grading to fine conglomerate - microbreccia.
④ Very coarse breccia-conglomerate, similar to ②, grey in colour.
⑤ Reddish, medium-grained, x bedded quartzite, overlain by
⑥ Massive, coarse conglomerate, with angular Precambrian pebbles and cobbles } Basal conglomerate (symbol oooo)

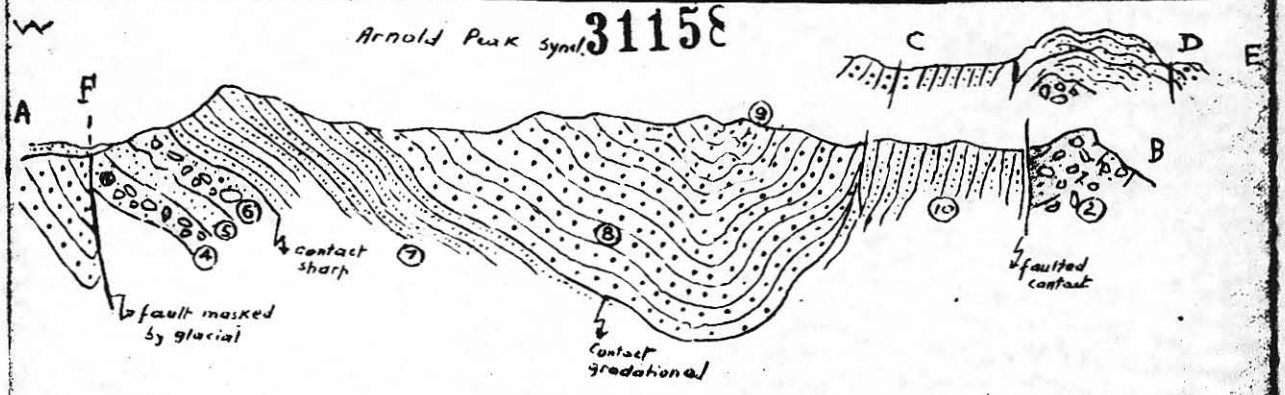
Note the following disposition:



cut & fill deposition

⑦ Well bedded, purple quartzite and grits, with coarse pebbly layers (rare) (symbol
⑧ Gravelly quartzites and micro-breccias and fine conglomeratic beds, with quartz, chert, etc. as fragments, generally rather loose in sandy matrix. These beds are lithologically similar to (and appear to correspond stratigraphically with) the beds of the hills flanking Lake Selina to the east (⑭ and ⑤ of photog. 23983), to be found also west of Lake Rollaston etc. (⑤ of photog. 28972).
⑨ Massive, light-coloured quartzites.
⑩ Purple, fairly well bedded quartzites.
⑪ Deep purple, well bedded sandstone

General stratigraphic succession and structural disposition along A-B and C-D:



Panoramic view of the western part of section above, looking north

Murchison Rng D.

MURCHISON (9) — 31159

009

446172

↑ RUN (9) MURCHISON 31159

010

446173

Murchison Run 9 – 31159

fault: crushing and quartz- hematite mineralization.

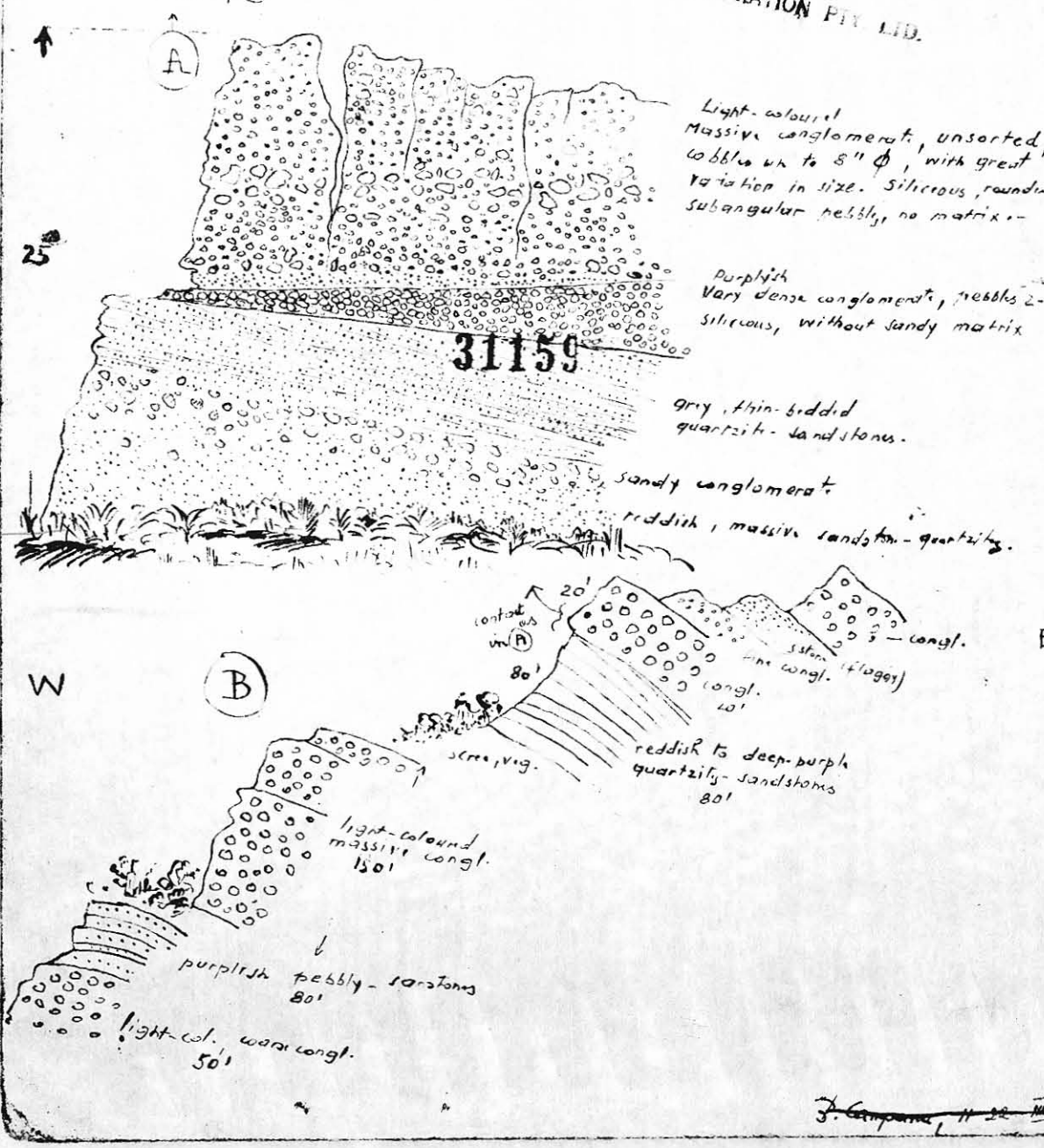
This work (1957) has been revised in 1958. See detailed description photog. 31158 Murchison, Run 9. (March 1958)

① Coarse conglomeratic layers, grey, in thick beds } "Owen Conglomerate"
② Interbedded purple quartzite and pebbly quartzite }
③ Scree ④ Alluvial flat ⑤ Glacial: boulder moraines, in part covered by scree.

Fl. III/57

May 1958 F.C. JK.

RIO AUSTRALIA EXPLORATION PTY. LTD.



F. Campana, II 22 III 1957

011

Murchison Run 9 – 31159 44614

This work (1957) has been revised in 1958. See detailed description photog. 3158 Murchison, Run 9. (March 1958) — original red

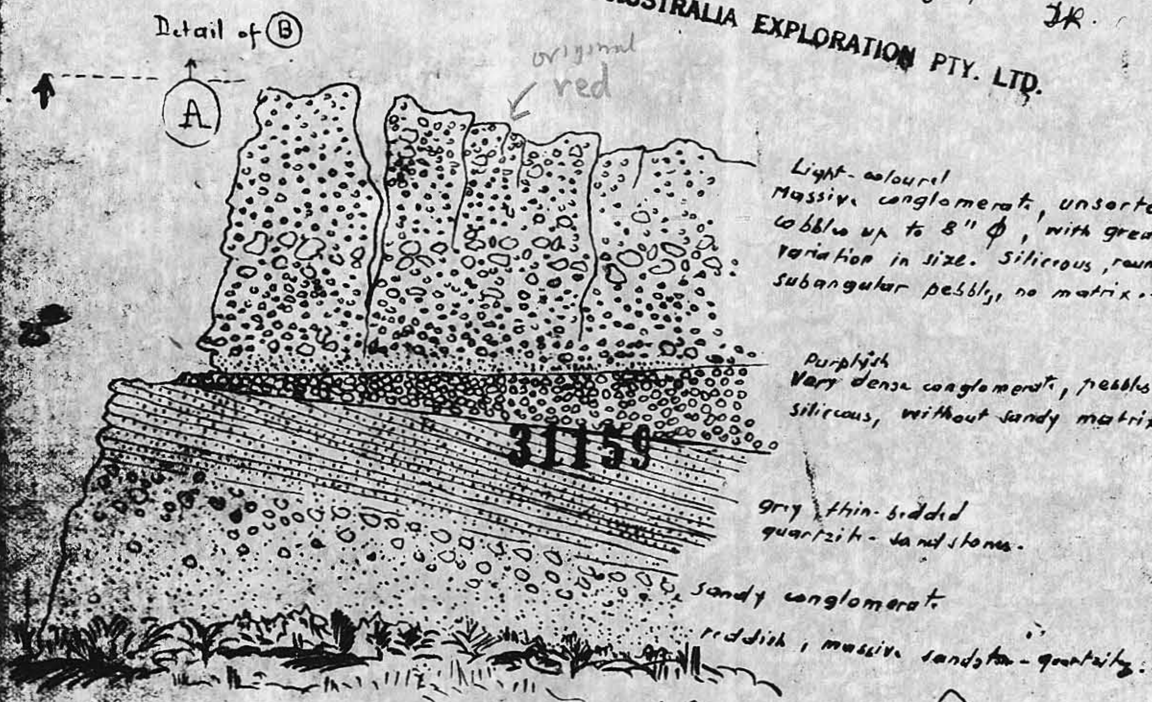
① Coarse conglomeratic layers, grey, in thick beds
② Interbedded purple quartzite and some pebbly quartzites } "Owen Conglomerate". [signature] III/57
③ Scree ④ Alluvial flat ⑤ Glacial: boulder moraines, in part covered by scree.

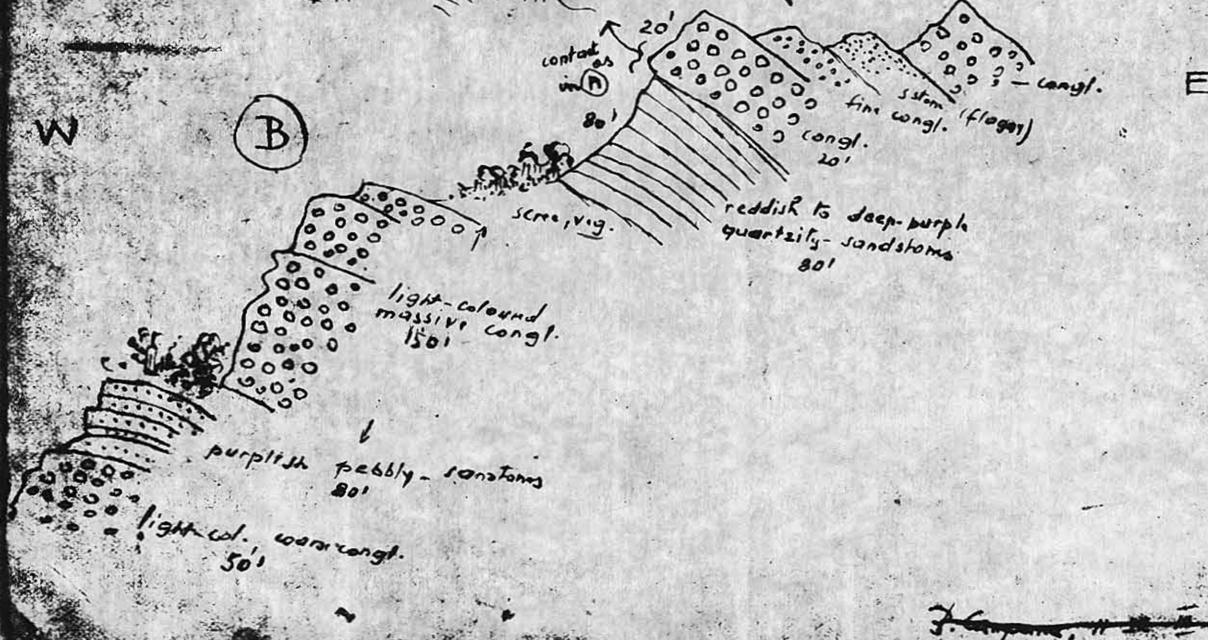
original black

Original red below this line

May 1958: [initials]

RIO AUSTRALIA EXPLORATION PTY. LTD.





J. Campana, 11 III 1957

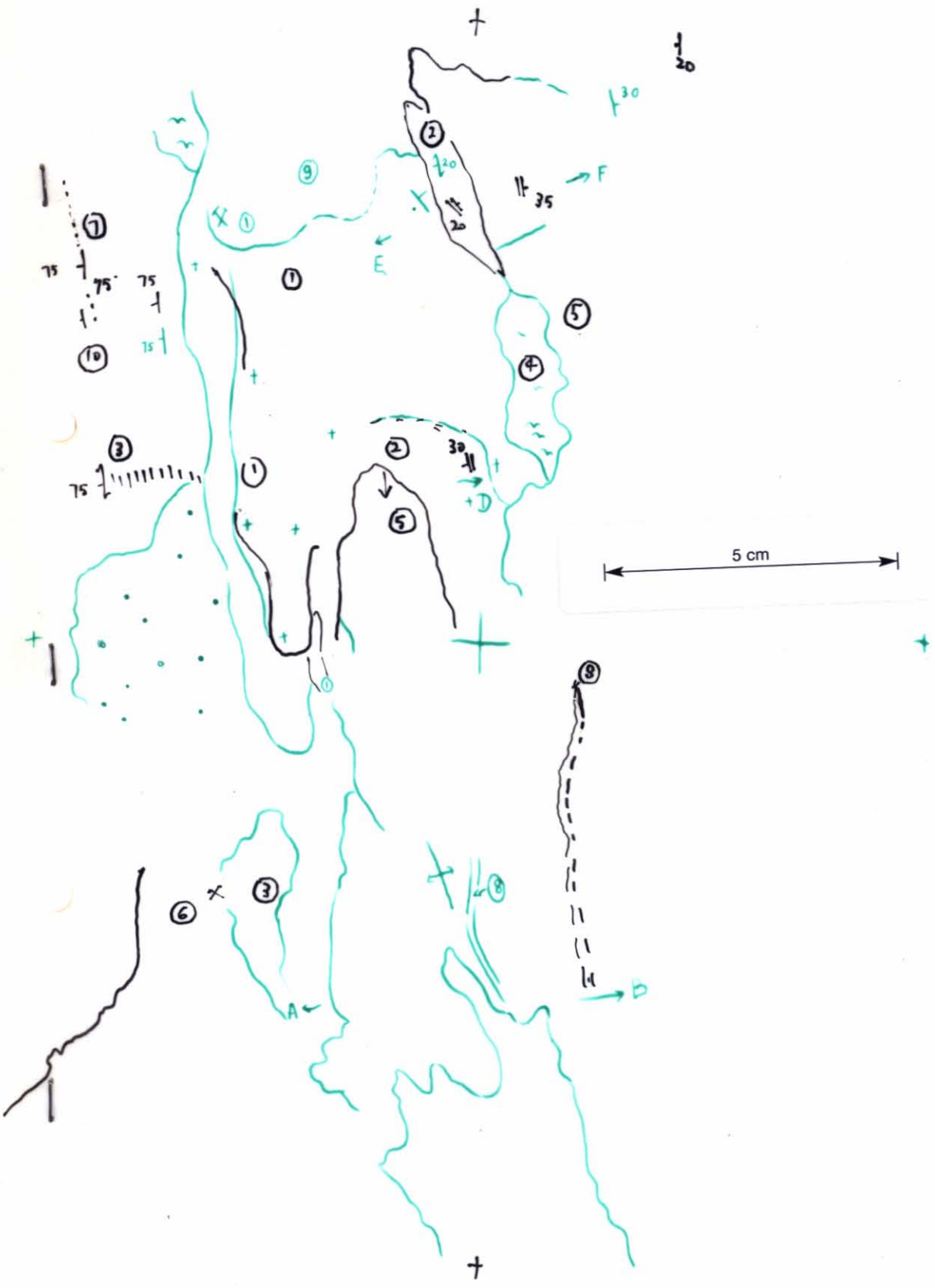
12 secs

12 sec.

MURCHISON 9 — 31160

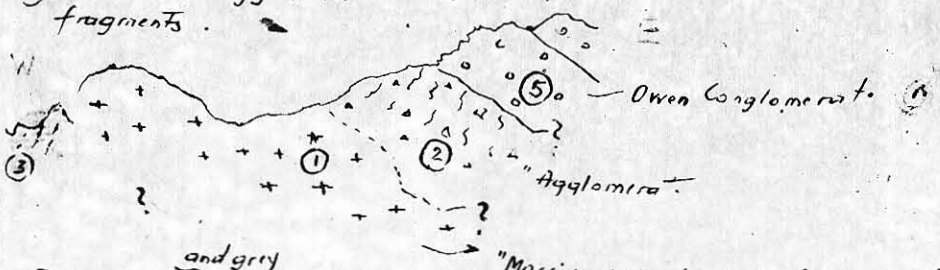
446175

012



(1) Massive, dark green "pyroclastic" : dark green groundmass with red felspar "streaks" = Red Hill massive porph "pyroclastic".

(2) Schistose "agglomerate" : hematite "pebbles" and also rock type like (1) as rounded fragments.



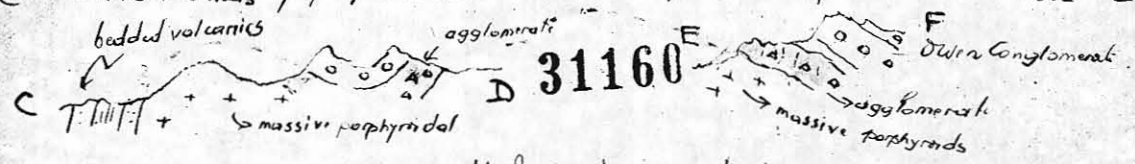
(3) Greenish and grey schists, some with a granular texture. ? Metamorphosed volcanics.

(4) Alluvial. (5) Course "Owen Conglomerate" with rare sandy lenses (partly reddish-purple and cross-bedded".

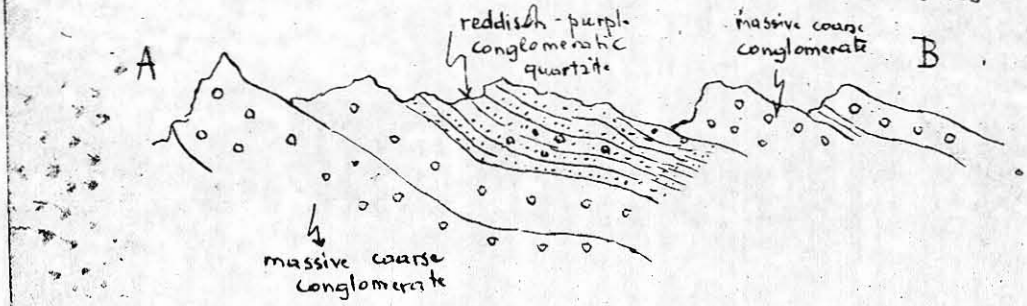
(6) Quartz + Pb - Zn - Cu sulfide mineralization (scanty) associated with dark carbonaceous slates in quartz-sericite schists country rock.

(7) Thin band of quartzite (bedded) : note that bedding plane and schistosity coincide.

(8) Quartzite bands, purplish and well bedded, intrastratified in the "Owen Conglomerate".



31160



(9) Red Hill mineralized body : a dark chloritic, hematite-magnetite rich microcrystalline basic body (basic lava), with pockets and veinlets of chalcopyrite, weekly radioactive in places.

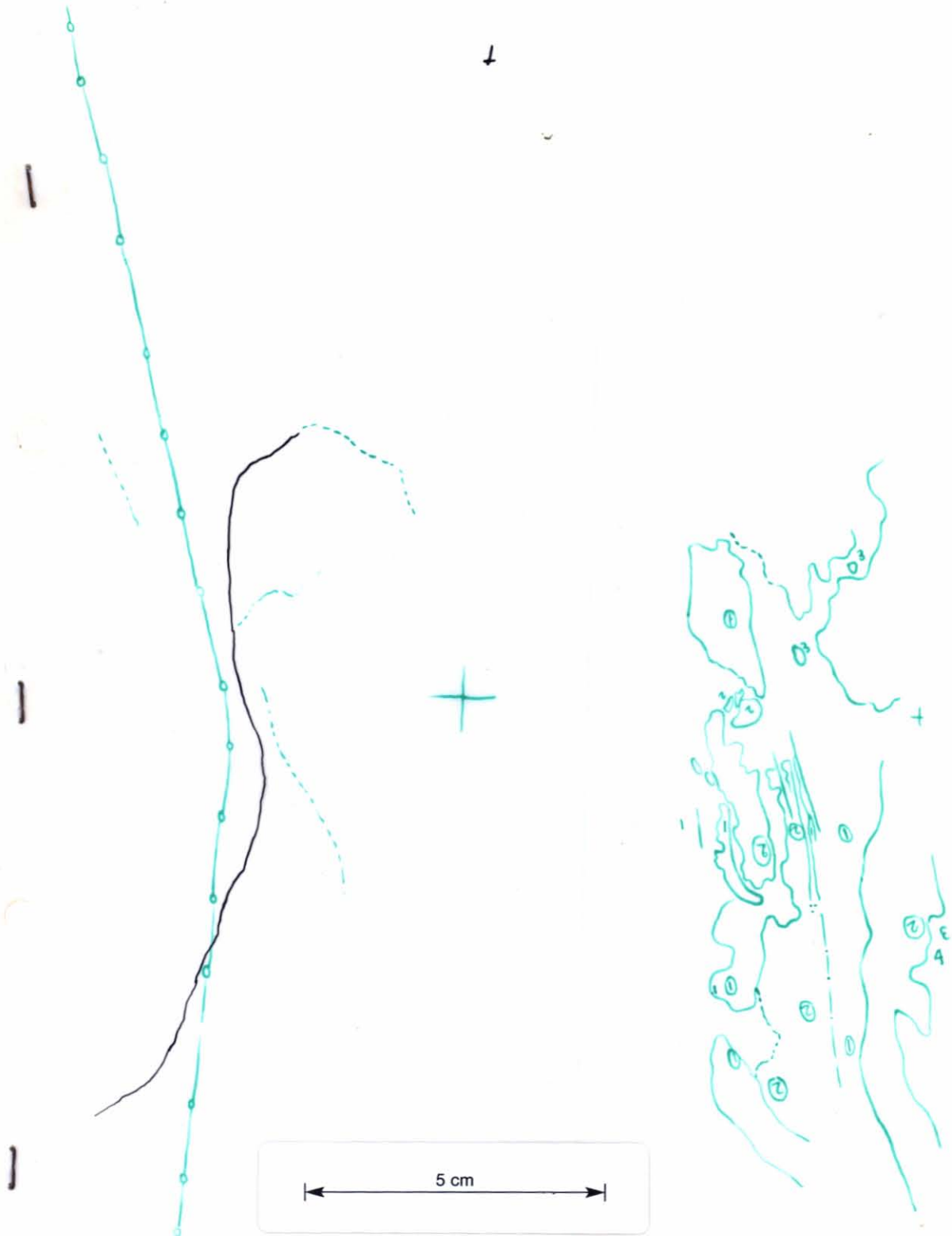
(10) As (9), but further observations (under V. Cattle guidance) reveal the presence of : a) well bedded, sandy (siliceous) sediments (bedded)
b) dense lava-like horizon with unoriented rock fragments in the following disposition : W  E

Murchison Rng q, 31160.

MURCHISON 9 — 31161

014

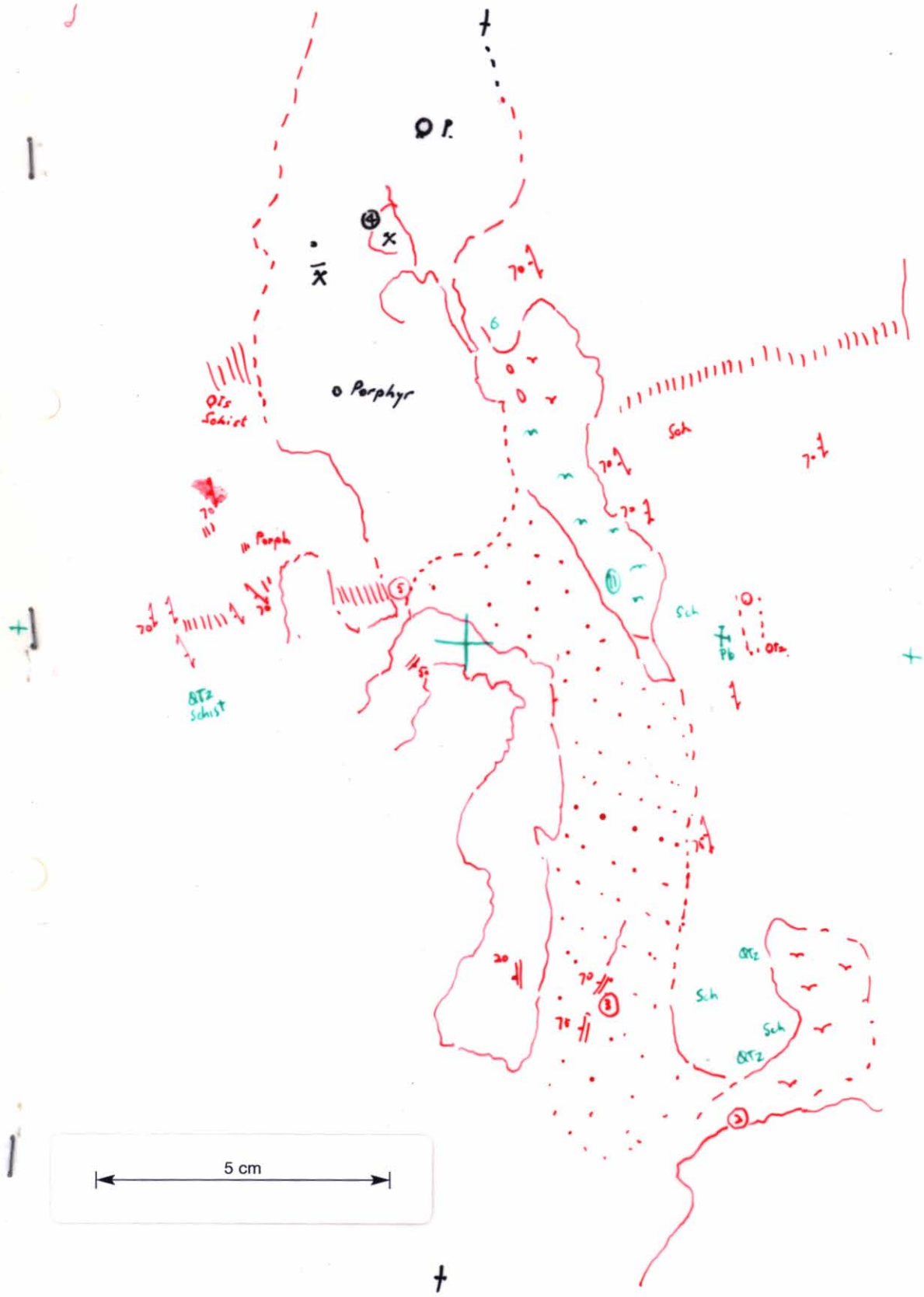
446177



↑ RUN 9 MURCHISON 31161

MURCHISON 9 – 31162

446178



↑ RUN 9 MURCHISON 31162

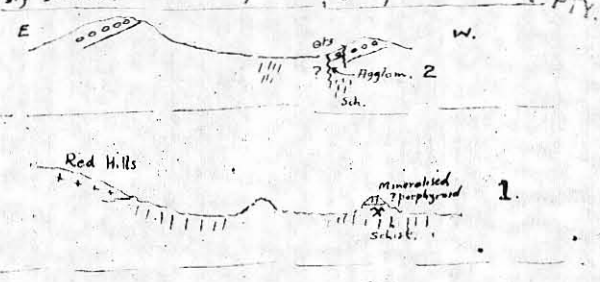
015

446179

1. Highly broken and silicified ?porphyroid capping on small peak. Adit on west side trending easterly under hill shows sparse galena, some pyrite and siderite gangue on dump. Appears to be mineralised in narrow irregular fractures. Numerous ramifying quartz veins throughout this prominent outcrop, and reddish-brown colouration due Fe staining a feature. Probable fault zone. Schist comprises complete periphery of peak.

2. Agglomerate. Pebbles and angular fragments in grey schistose matrix; pebbles mostly small (¼inch) but odd ones up to 3inches diam. Overlain immediately to south by Owen Conglom., while to north along foliation is normal schist.
Quartz "blows" occur most of the way between 1 and 2 (only), and probably mark a fault zone. The ?fault also appears to have been reflected also in the Owen Conglomerate here as the conglom. terminates against quartz blow along same line, reappearing at a much higher level to the east.

3 Small exposure of light creamish-coloured laminated sandy shale. Much less ?indurated and than schists to east and not noticeably stressed. Note steep westerly dip. Similar bedded o/c few yard south. Possibly Ordovician.



31162

4 Deep shaft (?40') in reddish brown Quartz Porphyry. (resembles Red Hills type but quartz phenocrysts more regularly developed. Only porphyry on dump although schist outcrops only few yards to east (steep dip?). No mineralisation observed except Mn. staining and probably tested because of similarity to Red Hills. More workings (E.W costean and pits) in same rocks 200yards to west. Porphyry passes gradationally to the westward into ~~gneiss~~ coarse quartz-sericite schist in which remnants of porphyry structure still evident.

5 Massive quartz porphyry (same body as 4) ~~rocks~~ occurs at unconformity below Owen Conglom.

6. Schistose porphyroid rocks, at gradation from quartz porphyry to quartz-sericite schist. Here some agglomerate was seen in very minor amounts.

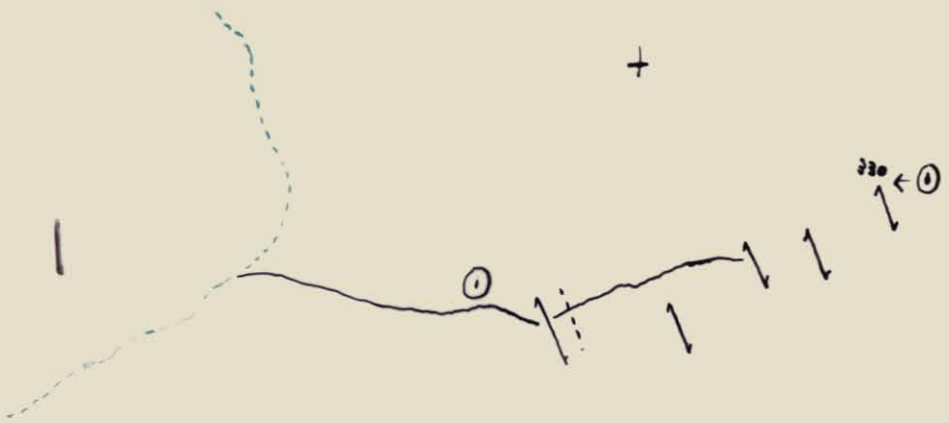
31162 Murchison Rm 9

C. Owen Conglom.

MURCHISON 9 - 31165

016

446130



5 cm

RUN 9 MURCHISON 31165

446181

MURCHISON WEST TIE 26052

044

← W. TIE MURCHISON 26052

045

44682

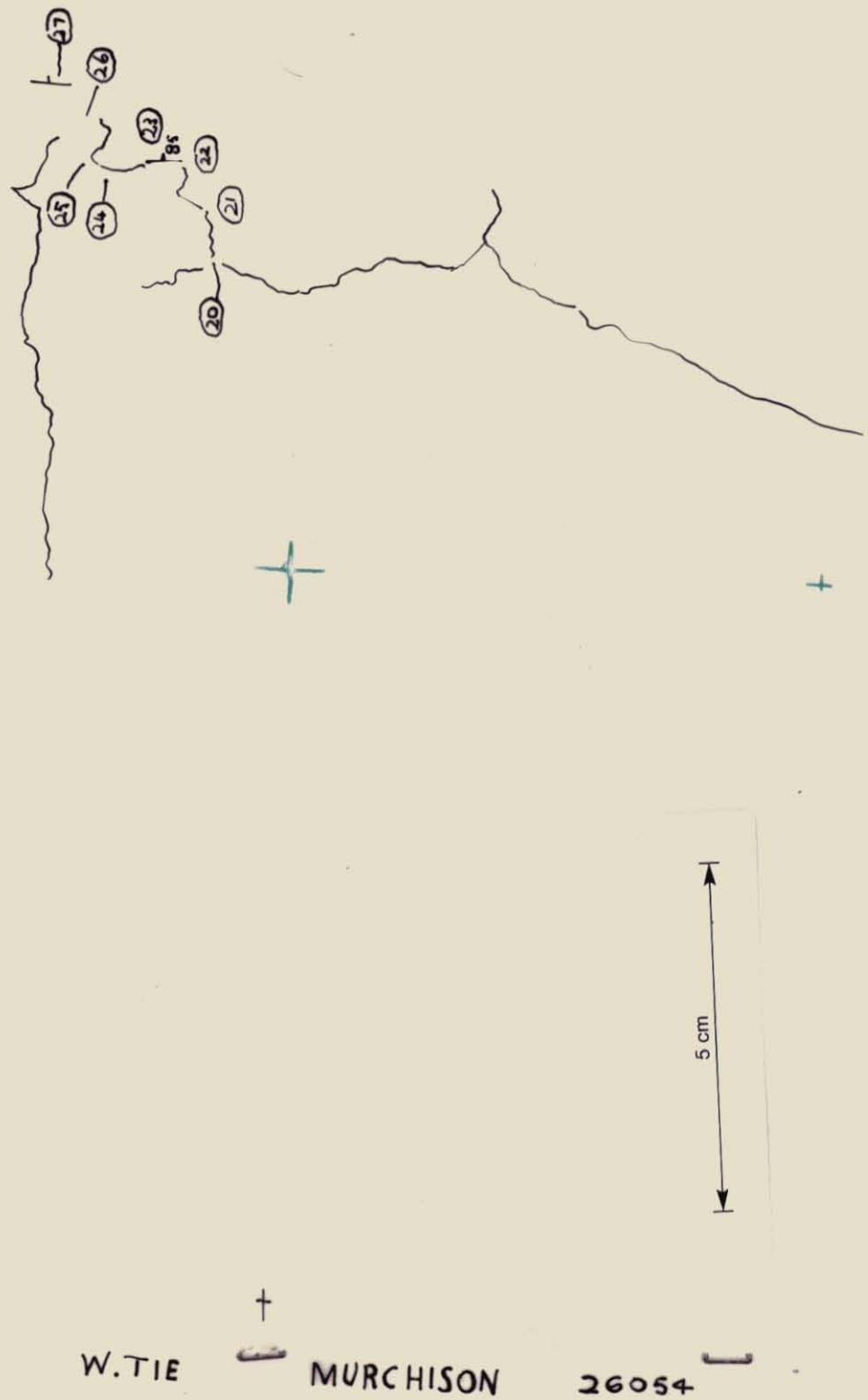
WAB 6/2/58

① Pale coloured rock with pink markings - silicified and chert like. Thin interbedded shales - 330/80E.
② Leached iron capping over a black buggy shale.
③ Fawn coloured chert - sheared 330/V
④ Gossonous like deposit on rocks on S. creek bank
⑤ Silicified mudstone
⑥ Float in creek - iron stained and silicified - contains pyrite & galena.
⑦ Tuff - cream with basic feldspar content.
⑧ Chert containing pyrite - a yellow slurry oozes from south bank about 15' above this - slurry is about 6' wide & 3' deep
⑨ Shearing green mudstone 330/70W for about 300 ft.
⑩ Purple slates - bedding parallel to cleavage 300/V
⑪ Black slates/graphitic = pyritic bearing - pyrite occurs as kept like lens like deposits in the bedding

Murchison U. Lee

26052

MURCHISON W TIE 26054



5 cm

W.TIE MURCHISON 26054

446184

049

S. Zirk 5/2/59

(20) Blue or green massive pyroclastic – tuff - no distinct bedding

(21) Same as (20) slightly mineralised

(22) Massive coarse green tuff interbedded with a finer grained tuff containing segregations of pyrite

(23) Fairly coarse grained green feldspathic tuff Strike 350° dip 85° E

(24) Massive lava containing large phenocrysts of pink feldspar

(25) Finer grained lava containing feldspar phenocrysts up to 2mms in diameter

(26) same as (25)

(27) Fine grained slightly sheared tuffaceous rock strike 360° dip steeply east, interbedded with a banded black slate.

Archean

26054

RIO AUSTRALIA EXPLORATION PTY. LTD

MURCHISON WEST TIE 26056

050

446185

051

446186

G. Fish 11/2/59.

① Massive cleaved pyroclastic - green coloured fairly coarse lava.

② Massive green siliceous pyroclastic weathering to a white colour & containing orange-pink phenocrysts of feldspar & minor disseminated grains of pyrite

③ Lava containing feldspar phenocrysts in a green-blue siliceous matrix. Lineation well developed at 345°

④ Well cleaved microcrystalline lava very siliceous & is a fawn-blue in colour.

[illegible] S TIE

26056

046

446187

G. Fish 5/2/59.

(1) Massive green coloured sheared rock containing calcite, chlorite. Lineation or joint direction 300° interbedded with a massive pink-brown feldspathic rock containing minor veins of pyrite.

(2) Green siliceous rock rich in cubic pyrite grains & also containing small galena veins (as specimens-See Edgar). It shows a faint Lineation at 320° & is associated with a brown coloured Sheared Tuffaceous rock. Bedding Strike 355° dip vertical

(3) Dark green chloritic slate or shale containing quartz veins. Strike 350° dip vertical. Pyrite ~~plentifully~~ common. This is interbedded with a green sheared feldspathic tuff.

(4) Grey-green sheared feldspathic shale containing minor veins of pyrite interbedded with a mineralised black ~~shale~~.

(5) Soft purple slate interbedded with a chloritic slate which contains pyrite. Bedding Strike 180° dip vertical.

(6) Green chloritic slate interbedded with a mineralised siliceous rock containing chlorite. Strike 360° dip steep east.

(7) Grey siliceous shale interbedded with a green chloritic slate & a quartzite. Strike 360 dip steep east.

Across strike east → west. Purple slate, chloritic slate containing bands of grey siliceous slate, green siliceous rock containing chlorite & a brown quartzite

(8) Grey-green shale strike 5° dip 75° east.

(9) Soft purple shale Strike 360° dip 80° east interbedded with a green chloritic shale.

(10) Chloritic shale mineralised Strike 350° interbedded with a purple shale

(11) Purple shale Strike 350° dip 85° E

(12) Purple shale interbedded with a green sheared tuff to the west & a green chloritic shale & a purple shale to the east. Strike 350° dip steep east.

(13) Purple banded shale Strike 360° dip ~~steep~~ almost vertical interbedded with a sheared green tuff.

(14) Green shale Strike 360

(15) Green chloritic shale interbedded with a sheared green feldspathic mineralised rock Strike 350 dip almost vertical.

(16) & (17) Green tuffaceous rock fairly feldspathic containing chlorite.

(18) Bluish coloured massive pyroclastic - tuff.

(19) Bluish tuff no bedding slightly sheared at 360° associated with a fine grained green tuff.

Murchison W. Tie 26053.

047

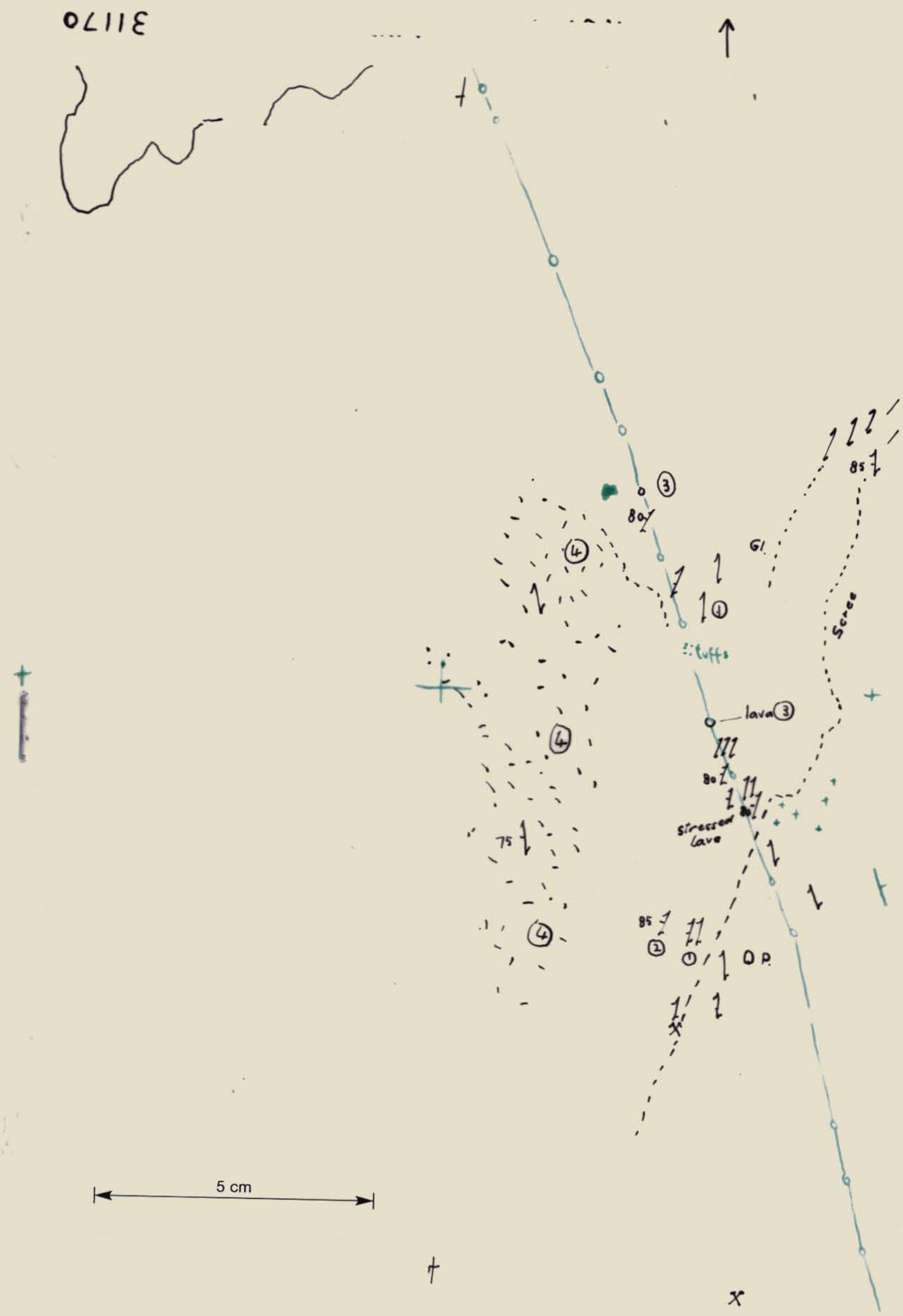
MURCHISON WEST TIE 26053

446188

MURCHISON 10 — 31170

017

446189



L10

018 446190

D. King & Brook. 12/2/55

① Laminated greenish shales ~~[illegible]~~ 10/80W quartz veining - adjacent siliceous mudstone type

② Dark green pyritic, siliceous slate and chert - drag folded (also ~~[illegible]~~ 345 strike) slates 360/85W (laminations or schistosity?) Adjacent similar rock with pink feldspathic patches.

③ Massive dense microcrystalline, pink and grey mottled lava type.

④ Extensive zone of white weathering, fine grained lavas with odd quartz and feldspar phenocrysts. Mostly free of stress and monotonously similar throughout. (Spec. ⑩ shows this)

⑤ Quartz sericite schist (stressed equivalent of ④ ~~[illegible]~~ 345/75W.

⑥ Similar to with veins of haematite.

⑦ Chloritic - sericitic schist 320° strike (sed. type ?) Associated with highly decomposed rocks resembling tuffs. Strike 360 at mill.

[illegible] 10

31170

MURCHISON (O - 31171

019

446191

31171

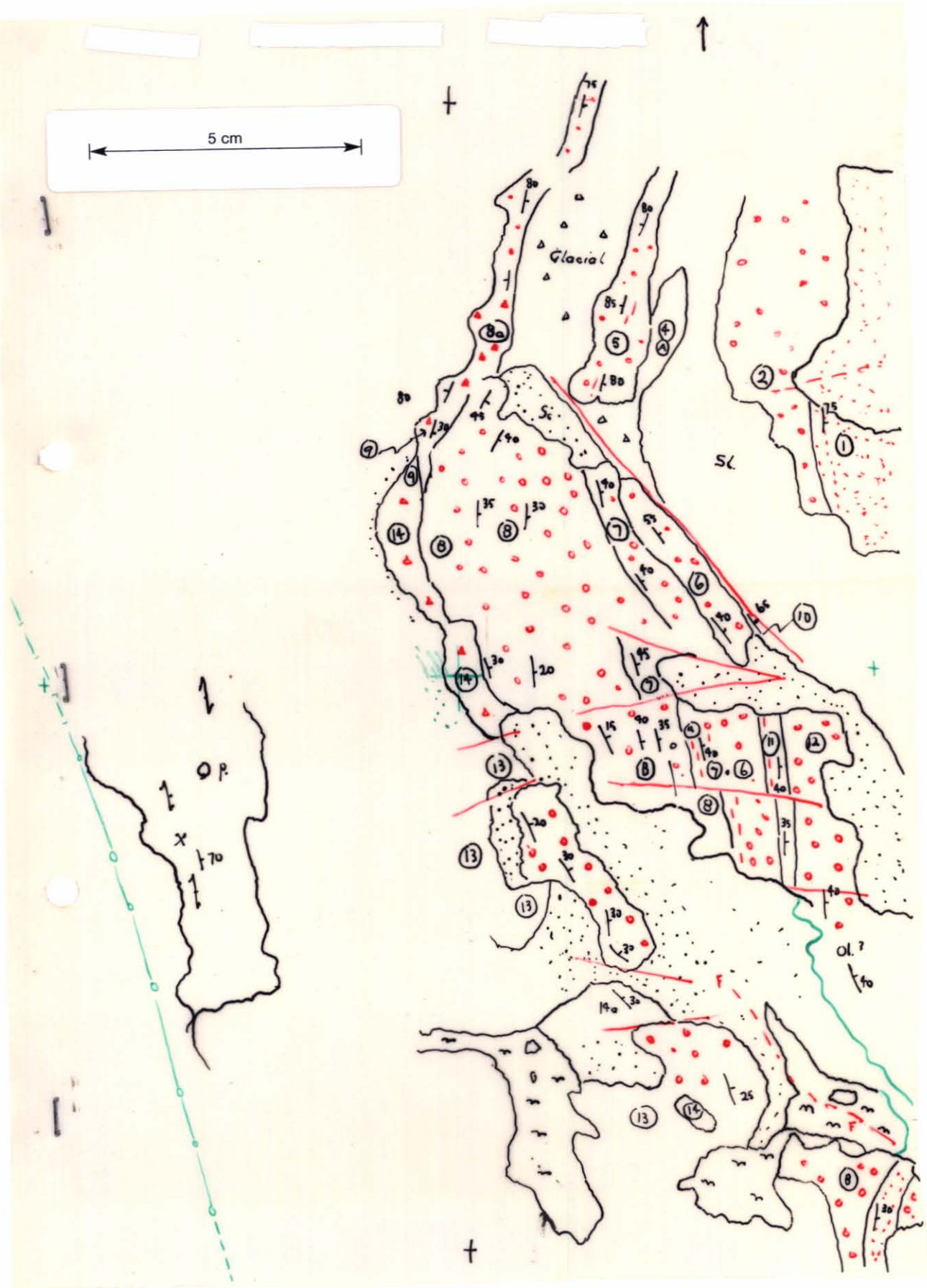
NO GEOLOGY ON THIS PLATE

5 cm

MURCHISON 10 — 31172

446192

C. 023



12-XI-58 W.J.A.

(1) Oma. Refer other photos. M-11/31267.
(2) White-pink siliceous conglomerate. Pebbles 1"-6" ϕ. Contains sparse partings of red-sandstones. Not considered to constitute actual basal Owen as pebbles generally smaller and s'stones more common. Underlies type Oma.
(3) Scree. (4) Highly stressed (preferentially sheared) l. greenish-grey quartzites and purplish siltstones. Yellow in outcrop.
(5) Fine conglomerates (pebbles <3" diam.) with sandy beds and fill structures common. (in parts 50% sands) Well bedded where sandy, but lensing of sandy layers common. Slight shearing of sands. Thickness 300'-400' ft approx. Colour shades of grey, pink + yellow.
(6) Pink cong. Pebbles of quartz and quartzite, angular and/or rounded, sparse sandy matrix. Minor pink sandy partings. Appearance similar to (2)
(7) Fine white-pink cong, contact with (6) gradational. Pink sandy partings becoming increasingly rare.
(8) Basal Owen, coarse white pink-cong. Pebbles becominging coarser lower in the sequence. See descp on adjoining photos.
(9) Well bedded, reddish-grey sandy beds with minor conglomerate bands. l. yel-grey fresh. Down dip no. of cong. beds increase. Appear to underly (8), no evidence for faulting.

(8a) Owen conglomerate, possibly pebbles a little finer than in (8) Relations with overlying formations appear doubtfull at present.

3117

The stratigraphic relationships of (2)-(7) have yet to be defined exactly. However the following is suspected.
(a) The basal Owen becomes increasingly sandy upwards forming (6) + (7)
(b) Lateral gradations also occur, (4) lenses out into (5)
Thus the gradation from true basal Owen to the sandy facies of the Middle Owen is characterized by the presence of sandy conglomerates 5-7, siltstone intercalations (4) and course cong. (2). gradations between each formation or the absence of one, being
(10) Oma exposed in creek bed, overlain by scree. Pinkish-purple quartzites with minor amounts of small (<1½") quartz pebbles. Well bedded (3'-8") 14-XII-58
(11) Red tubicolor sandstones, well bedded with thin but often coarse conglomerate horizons and intercalations (Oma) Thickness 50'-100'. Overlain by (12) and underlain by conglomerates, somewhat sandy and transitional to basal AUSTRALIAN PETROLEUM with minor sandstone partings relatively well bedded. Correlated with conglomerate at base of Omb.
(12) Coarse (1"-8") light pink conglomerate
(13) Red-orange felsitic lavas (Dundas see adjoining photo B.C. In faulted contact.
(14) Jukes Horizon. Detailed descrip. see adjoining photos. In disconformity with basal Owen, contact subject to minor faulting. Contact with Dundas lavas faulted. Thickness 150'-250'. Exhibits variations in texture along strike from coarse grits to an unsorted conglomerate containing jasper, quartz and porphyry pebbles in matrix of similar materials
(14a) An possible variation of (14) described by B.C. as agglomerate (Dundas)

Original black

12 secs

12 Secs

022

Hamilton Run 10

446194

12-XII-58 W.J.A.

① Oma. Refer other photos. M-11/31267.

② White-pink siliceous conglomerate. Pebbles 1"-5" ϕ. Contains sparse partings of red-sandstones. Not considered to constitute actual basal Owen as pebbles generally smaller and s'stones more common. Underlies type Oma.

③ Scree. ④ Highly stressed (preferentially sheared) l. greenish-grey ④ quartzites and purplish siltstones. Yellow in outcrop.

⑤ Fine conglomerates (pebbles < 3" diam.) with sandy beds and fill structures common. (in parts 50% sands) Well bedded where sandy, but lensing of sandy layers common. Slight shearing of sands. Thickness 300'-400' ft approx. Colour shades of grey, pink + yellow.

⑥ Pink cong. Pebbles of quartz and quartzite, angular and/or rounded, sparse sandy matrix. Minor pink sandy partings. Appearance similar to ②

⑦ Fine white-pink cong, contact with ⑥ gradational. Pink sandy partings becoming increasingly rare.

⑧ Basal Owen, coarse white pink-cong. Pebbles becominging coarser lower in the sequence. See descp on adjoining photos.

⑨ Well bedded, reddish-grey sandy beds with minor conglomerate bands. L.yel-grey fresh. Down dip no. of cong. beds increase ~~in~~. Appear to underly ⑧, no evidence for faulting.

⑧a Owen conglomerate, possibly pebbles a little finer than in ⑧ Relations with overlying formations appear doubtfull at present.

3117

The stratigraphic relationships of ②-⑦ have yet to be defined exactly. However the following is suspected.

(a) The basal Owen becomes increasingly sandy upwards forming ⑥ + ⑦

(b) Lateral gradations also occur, ④ lenses out into ⑤

Thus the gradation from true basal Owen to the sandy facies of the Middle Owen is characterized by the presence of sandy conglomerates 5-7, siltstone intercalations ④ and course cong. - ② gradations between each formation or the absence of one, being common.

14-XII-58

⑩ Oma exposed in creek bed, overlain by scree. Pinkish-purple quartzites with minor amounts of small (¼-1½") quartz pebbles. Well bedded (3'-8")

⑪ Red tubicolor sandstones, well bedded with thin but often coarse conglomerate horizons and intercalations (Oma) Thickness 50'-100'. Overlain by ⑫ and underlain by conglomerates, somewhat sandy and transitional to basal Owen.

⑫ Coarse (1"-8") light pink conglomerate with minor sandstone partings relatively well bedded. Correlated with conglomerate at base of Omb.

⑬ Red-orange felsitic lavas (Dundas see adjoining photo B.C. In faulted contact.

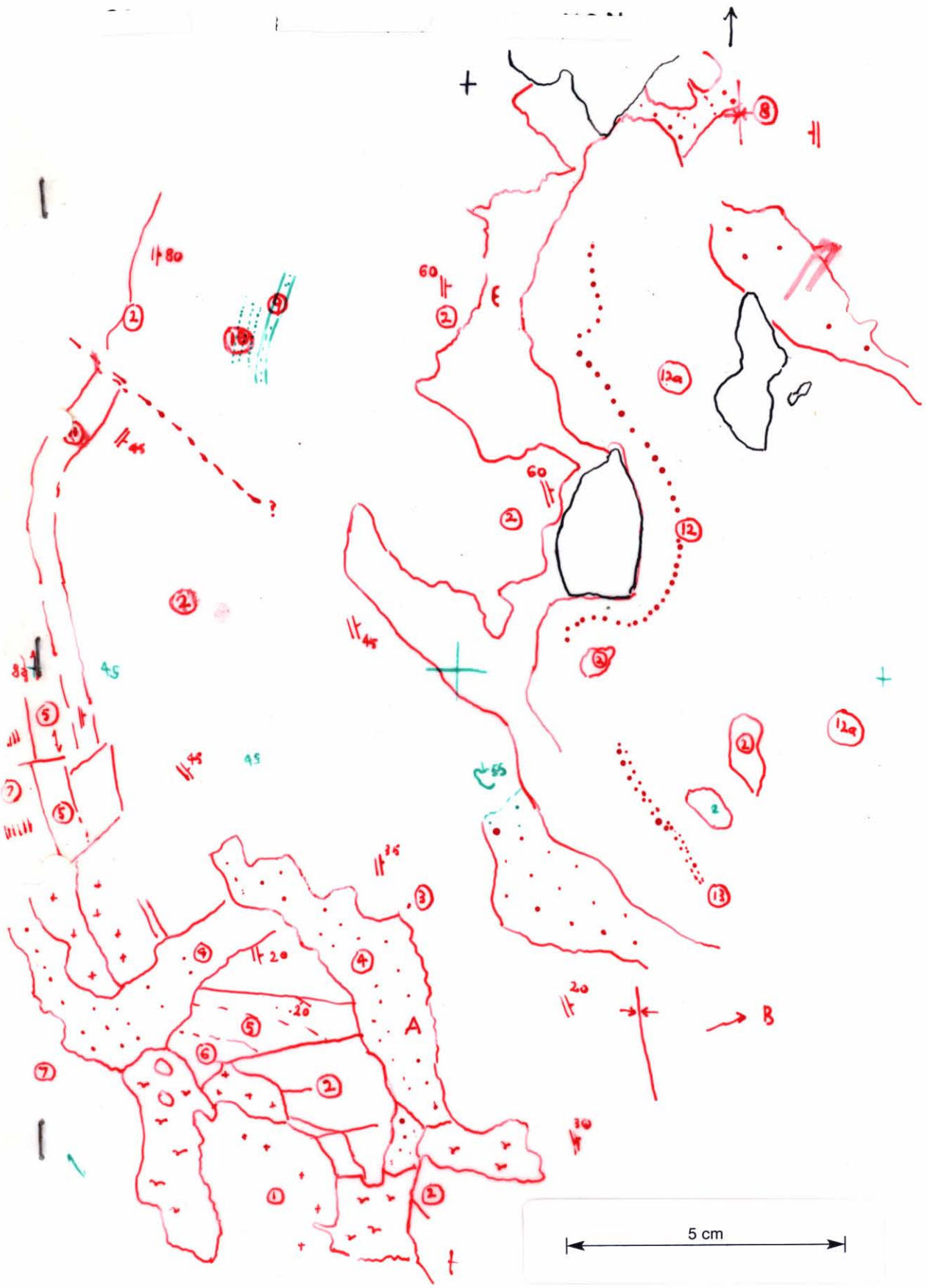
⑭ Jukes Horizon. Detailed descrip. see adjoining photos. In disconformity with basal Owen, contact subject to minor faulting. Contact with Dundas lavas faulted. Thickness 150'-250'. Exhibits variations in texture along strike from coarse grits to an unsorted conglomerate containing jasper, quartz and porphyry pebbles in matrix of similar materials

(14a) An possible variation of ⑭ described by B.C. as agglomerate (Dundas)

HUTCHISON RUN 10 — 31173

023

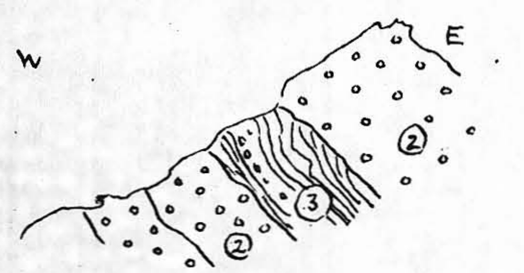
446195



① A massive, igneous rock with porphyroidal structure, reddish when weathered, dark green on fresh surface. Fine grained, felsitic groundmass with ? felspar phenocrystals up to ½ cm ϕ. An extrusive rock type, ? emplaced as a flow. = Red Hill massive pyroclastic.

② Owen Conglomerate. A coarse, dense, whitish conglomerate, almost free of fine material, with pebbles and boulders up to 20" ϕ – 80% of which are of 2 quartzite type: a siliceous structureless, white quartzite, with reddish to purple weathered surface and a schistose quartzite, white when fresh, grey (ashen grey) when weathered. / The former gives rise to well rounded pebbles, the latter to subangular ones. The conglomerate shows a crude bedding, each bed being 10-20' thick, uniformly dipping to the east. Also sheared quartz porphyry as pebbles & boulders.

③ Coarse to medium grained sandstone intercalations in the conglomerate, purple coloured, showing with the conglomeratic beds the following relations:



On the whole: a deltaic, shallow water, unsorted or poorly sorted formation, although perfectly washed (deposits of powerful, short rivers dissecting an elevated chain of mountains). No mineralization or intrusive vein of any kind, except quartz veins (rare). However, pebbles of hematite and pebbles of ? volcanic rocks are not uncommon. (regarded [illegible] as the continental infilling [illegible] [illegible] 1957).

④ Coarse scree.

⑤ A fairly coarse agglomerate, 150' thick, rapidingly grading to a dark green felsitic rock type (lava type) which passes in turn to ⑥ Tukes ? ?

⑥ Massive porphyroid rock, intersected by a dense network of hematite veins, up to 1" thick, filling unoriented fissures and joints. The rock is much brecciated, and consists of a reddish felspatic microcrystalline groundmass embedding clear quartz phenocrystals and dark minerals.

⑦ Schistose pyroclastic rocks, much stressed and sheared. Some bands still retain a massive structure, with dark green groundmass embedding evenly distributed felspar phenox.

⑧ Well bedded, reddish-purple quartzite – with conglomeratic bands and strings of pebbles, surmounting grey massive conglomerate.

⑨ Yellowish phyllite (interbedded?)

⑩ Grey quartzite. ⑪ Well bedded pebbly quartzite, at the base of massive conglomerate, with boulder up to 15" ϕ.

Relations between ⑩ and ⑪ ?

⑫a Boulder moraines. ⑫ Terminal moraine ⑬ Lateral moraine.

B. Campana
11-22. III. 1957

Murchison Run 10.

MURCHISON RUN 10 — 31174

025

446197

31174

026

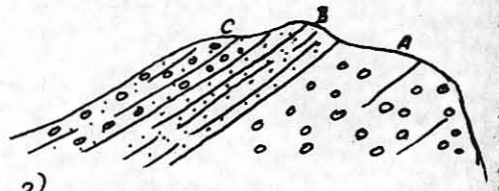
446198

(a) = lower formation of the middle Owen ie Om_a. A red-purple sandy sequence with minor but variable conglomerate beds and intercalations. In the cong. layers the pebbles are generally of lesser diam. than basal Owen. The formation is well bedded.

(b) = upper Middle Owen. Fairly similar lithologically to Om_a but predominately light pink in colour.

Sc = scree . Gl = glacial material, either moraine or wash.

(1) Section looking south. Lt (1)



A - Massive basal Owen Conglomerate.

B - 100' of red-purple, well-bedded. quartzites & minor cong. beds. = Om_a.

C - 50'+ of l.pink conglomerates with some bedding, minor sandy partings (= Om_b ?)

Sequence of L. & M. Owen thinning to south of area. Om_b is dominantly conglomeratic.

(2) Section A - B (approx) - Fault plane to N superimposed in back ground.

(4) Om_b - Here represented by l.pink conglomerates with minor l.pink sandy partings. Cong. generally finer than O?.

(3) Om_a - red-purple in colour, well bedded.

(3b) Sandy; quartzites with minor cong. layers.

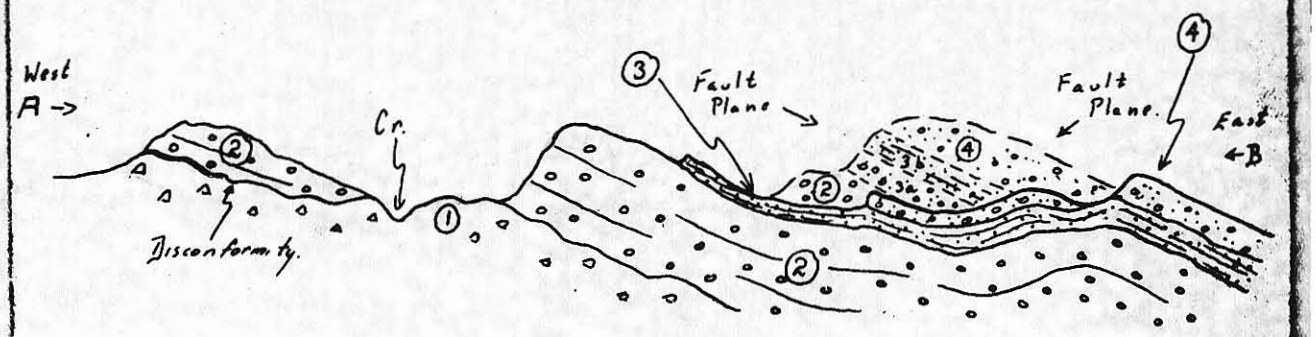
(3a) Fine conglomerate sequence containing many (50%) sandy beds. Cong. up to 15' thick. Sandstones well bedded.

(2) O?. - Massive, unsorted, basal Owen Conglomerate. No bedding, very little sandy material. Pink and white in colour.

(1). Jukes Breccia horizon. Disconformable with O?.

3117

RIO AUSTRALIA EXPLORATION PTY. LTD.

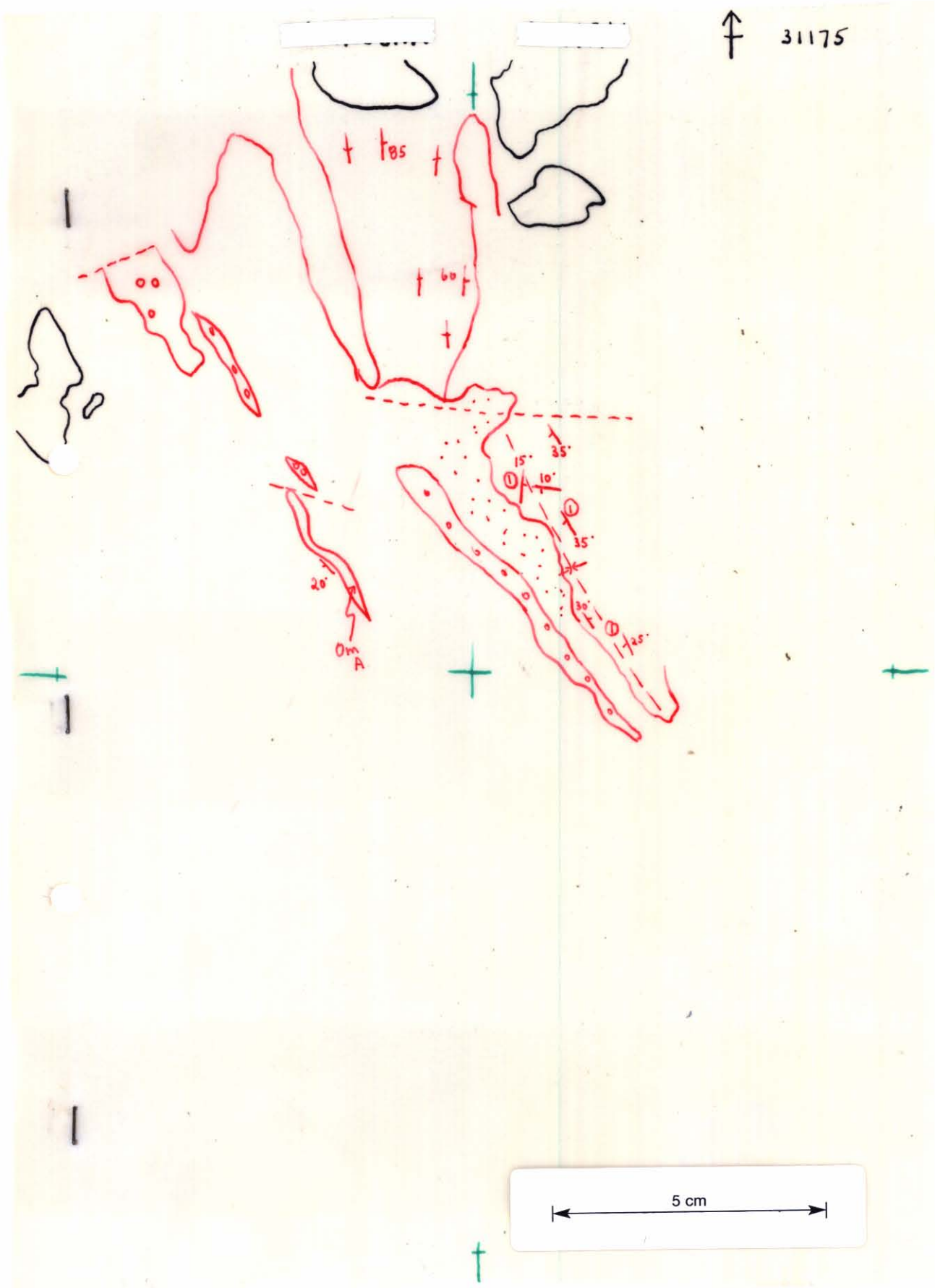


Murchison Run 10.

027

MURCHISON 10 — 31175

446199

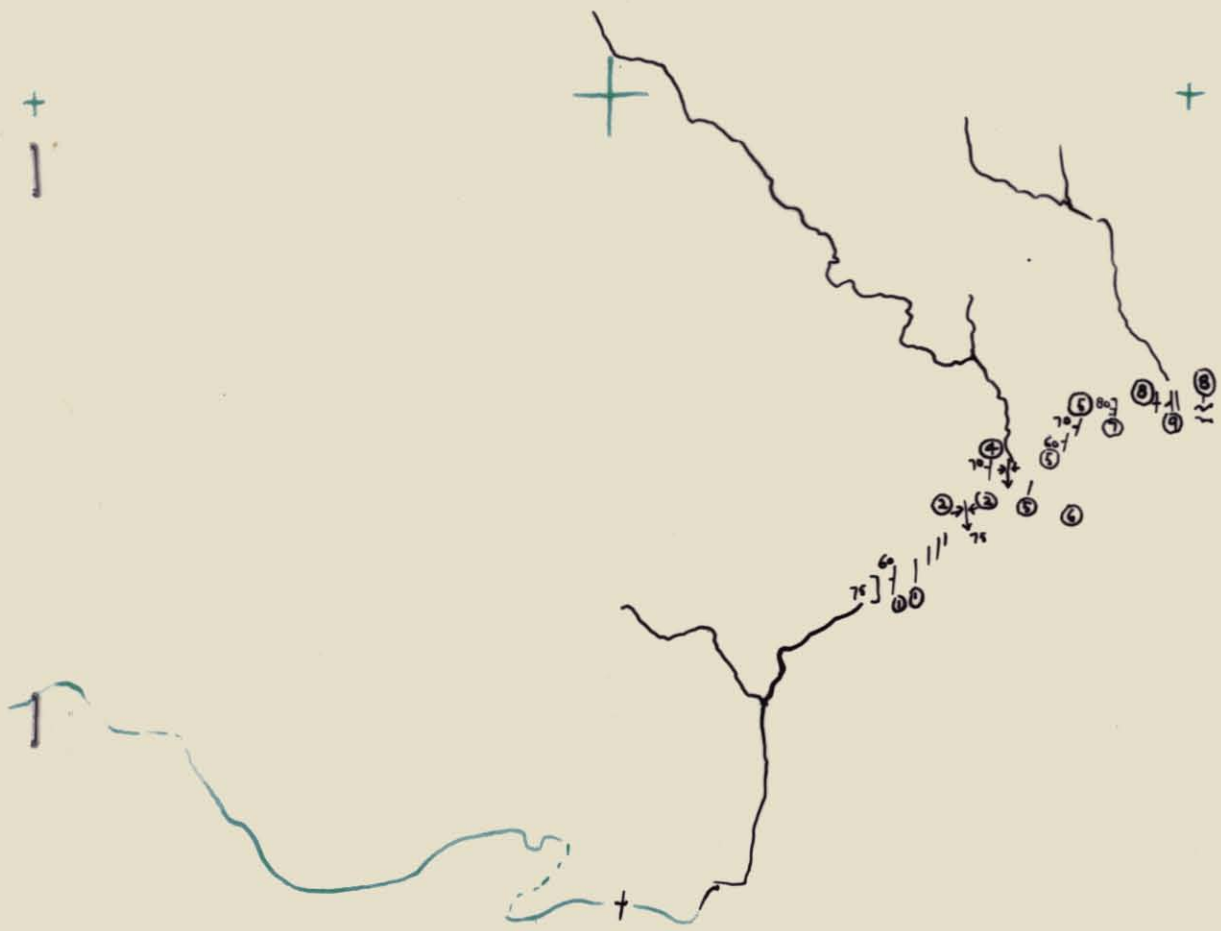


MURCHISON 10 — 31177

028

446200

5 cm



820

029

446201

W. Brock. Jan. 59.

① same as ⑮ on Murch. R. 9. No. 31155.
② Syncline in ① & quartz veining folded in the core.
③ Carbonaceous black shales - pyrite developed on cleavage planes and on a joint system at 100° to the cleavage.
④ Black shales - severely shattered - bedding ∥ cleavage - warped.
⑤ Severely contorted zone of ④ with intensive quartz veining.
⑥ Very massive quartzite - completely recrystallised.
⑦ Quartz schists & micaceous schists.
⑧ Sheared & contorted black shales.
⑨ A 3-4 foot band of the black shale with quartz grains - 50%. mainly angular 0.5mm - 6 cms. - are these clastic in origin or do they represent broken up quartz veins?

31177

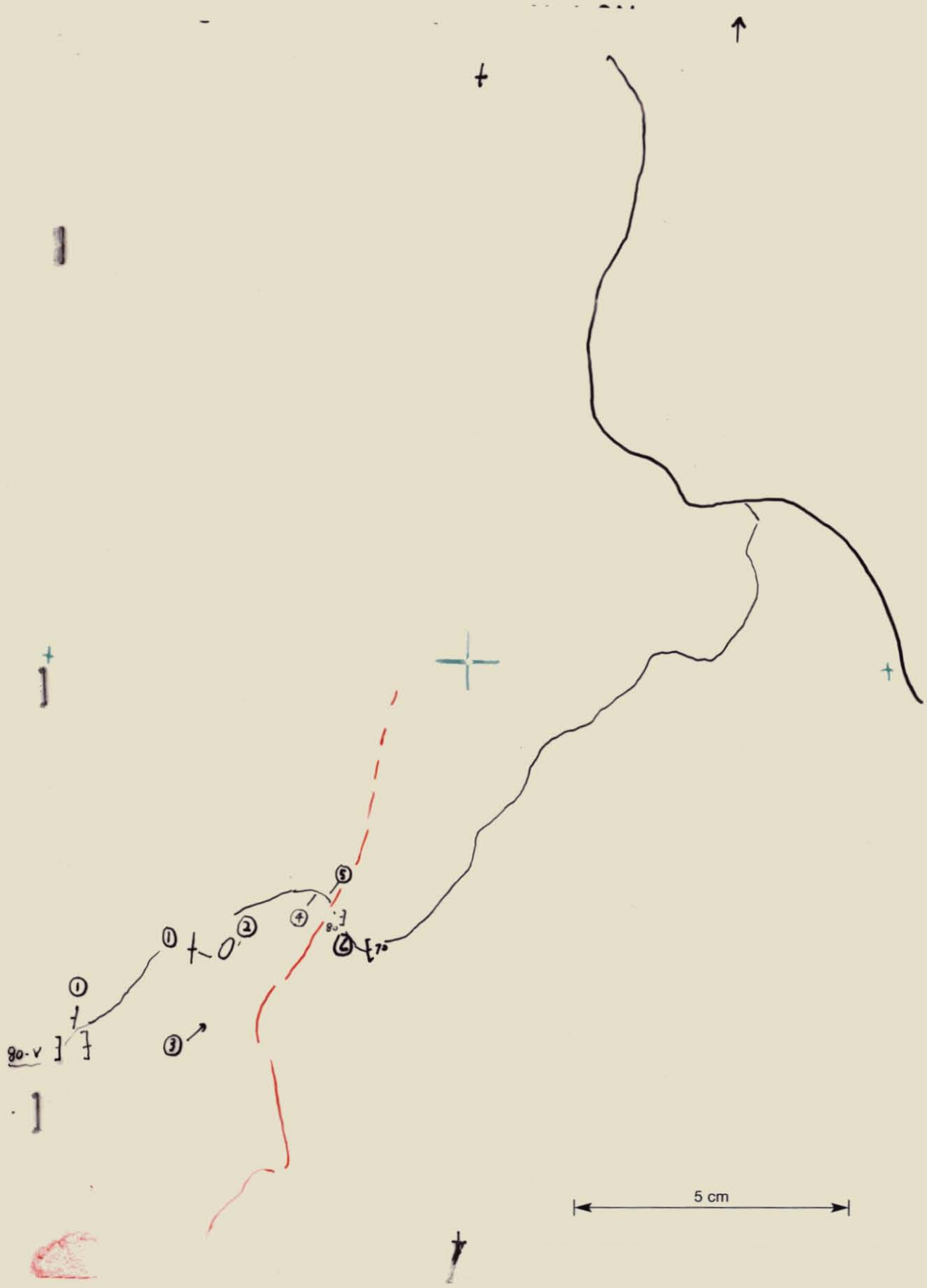
Murchison Run 10

RIO AUSTRALIA EXPLORATION PTY. LTD.

MURCHISON 10 – 31179

030

446202



031

446203

① Blue-black graphitic shales underlying contorted sandstone.
Bedding in shales parallel to cleavage. Pyritic. Cleavage varies from 20° to 170°.

② Massive quartzites

③ Dark shales c̄ thin qzite bands.
W. Brook. Jan. 59.

④ Sheared grey quartzites - heavily quartz veined.
⑤ Contorted blue black slates - heavily quartz veined.
⑥ Schisted quartzite - some muscovite developed.
⑦ White strongly sheared quartzite - completely recrystallised.

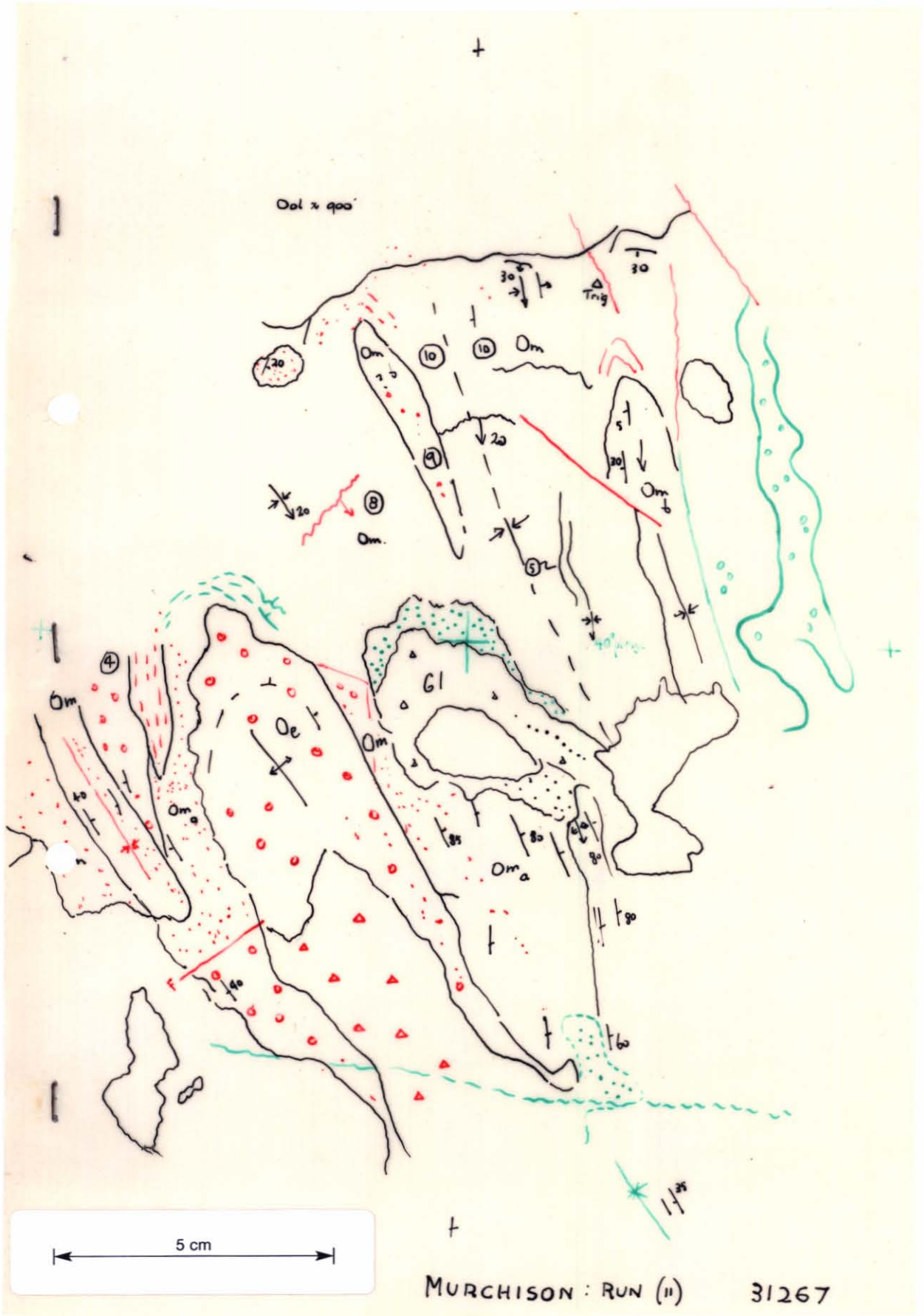
Murchison Run 10

31175

MURCHISON II — 31267

032

446204



(1) Fine conglomeratic layers, [pebbles up to 1"] angular and/or rounded, distributed in the sandy matrix often irregularly, quartz purple cherts etc. alternating with strongly cross-bedded grits and sandstones, generally purplish to greys. Some intercalations of light coloured finer quartzites. Fairly well bedded, in beds 1"-4" thick. In the lower half (= Oma) beds are darker and in more beds than the upper half (= Omb). The upper formation (b) is predominately light pinkish in colour.
(a + b) = middle Owen ≈ 800'.

(2) Massive conglomerate, formed by closely packed cobbles (up to 5" ⌀) of milky quartz, pink dense quartzite and white fluted quartzites. [identical with basal conglomerate observed elsewhere. Material is unoriented, unsorted with rare and crude bedding.

(3) Stressed purplish siltstones, giving rise to yellowish outcrops. Believed to occur interbedded with Oma, close to base.

(5) Thin (15') cong. bed in Om_A

(4) Om_B. Light cream and pink quartzites with conglomerate beds (pebbles 1"-2" ⌀) up to 10ft thick. Conglomerates definately overly, and grade into Om_A siltstones.

(6) Steep Southerly pitch (30°-50°) accounts for the apparent sharp break between Om_A and $_B$. No evidence for faulting.

(7) Siliceous shales [illegible] fine-grained sandstones [illegible] traces, micaceous sitting on conglomerate of [illegible]

(8) Purplish and [illegible] sandstone, in beds ≠2-4' thick.

(9) Fine conglomerate layers 30' thick, interbedded w sandstones.

(10) Well laminated purple sandstone, [illegible] with some siliceous mudstone intercalation.

032

Murchison Run 11. 31267

MURCHISON 11 – 31268

034

446206

035

446207

① Om_b : upper part of the middle Owen Conglomerate, as described on 11/31267.

② Contact basal Owen - Jukes horizon. Owen deposited on uneven erosion surface - disconformity. Contact possibly subject to minor local faulting.

③ L. pink conglomerate. Pebbles ¼"-3" ϕ. Pink sandy partings, common towards base. Overlies (some interbedding) the siltstones. Contact with overlying Om_b is gradational. Correlated as a basal conglomeratic intercalation of Om_b.

④ Greenish quartzite with minor sheared siltstone bands.

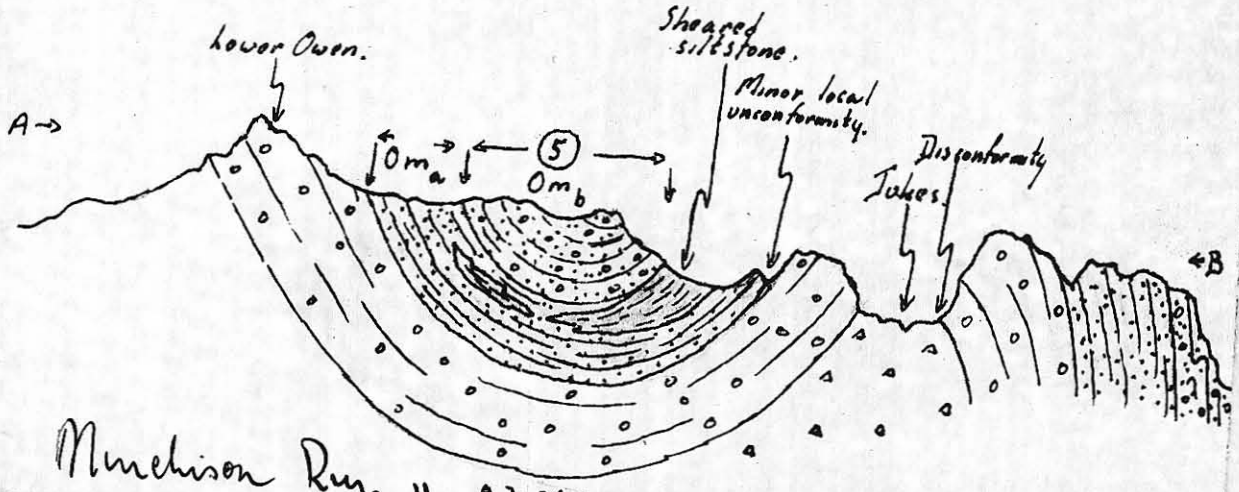
Siltstones (purple) considered a lensing formation of Om_a.

⑤ White and pink conglomerates with abundant sandy partings, forming abundantly cross-bedded quartzite bands and lenses of variable thickness (6"-2'). General coloration whites and light pinks. Correlated as Om_b. The proportion of conglomerates to quartzites in this formation varies, but generally the thicker quartzite beds occur near the top of the formation. Note - apparent change of pitch north of main folds. 10°-15°N.

⑦ Lower Owen Conglomerate.

⑥ A sandy conglomerate series, generally l. grey and yellow in outcrop. = ⑤ of 10/31172. Contains grey-green quartzites with sparse pebbles (¼"-1½") towards top, grading down into mixed conglomerate and quartzite beds 6"-2' thick, the conglomerates predominating at base. Distinguished from basal Owen by yellowish-grey colour in outcrop, much larger proportion of sandy beds "looser", less siliceous nature of matrix. Appears to underly ? ⑦.

⑧ Small patch sheared silt stone (= ④ of 10/3172 ?)

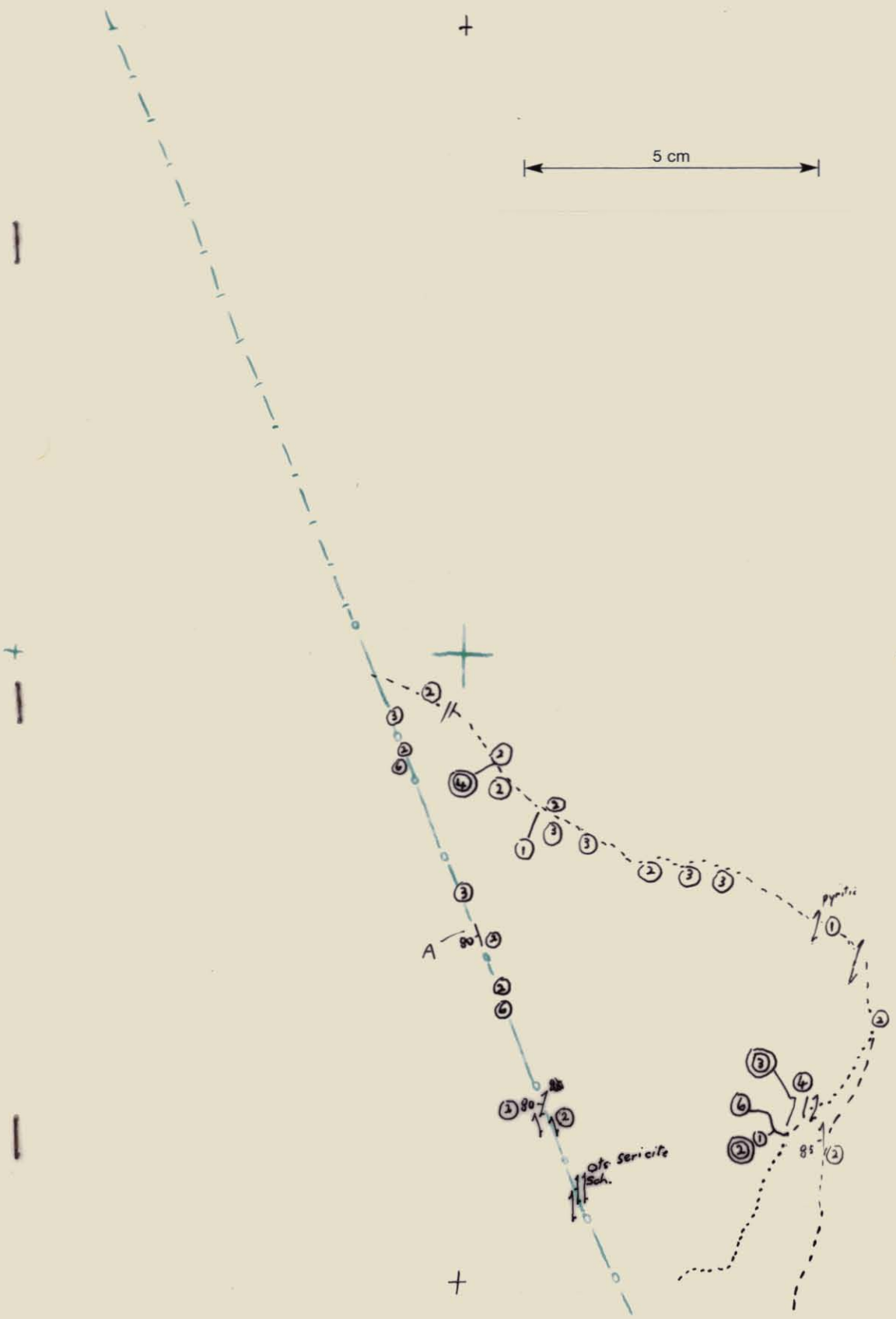


Murchison Run 11 03126 8.

MURCHISON II — 31272

036

446208

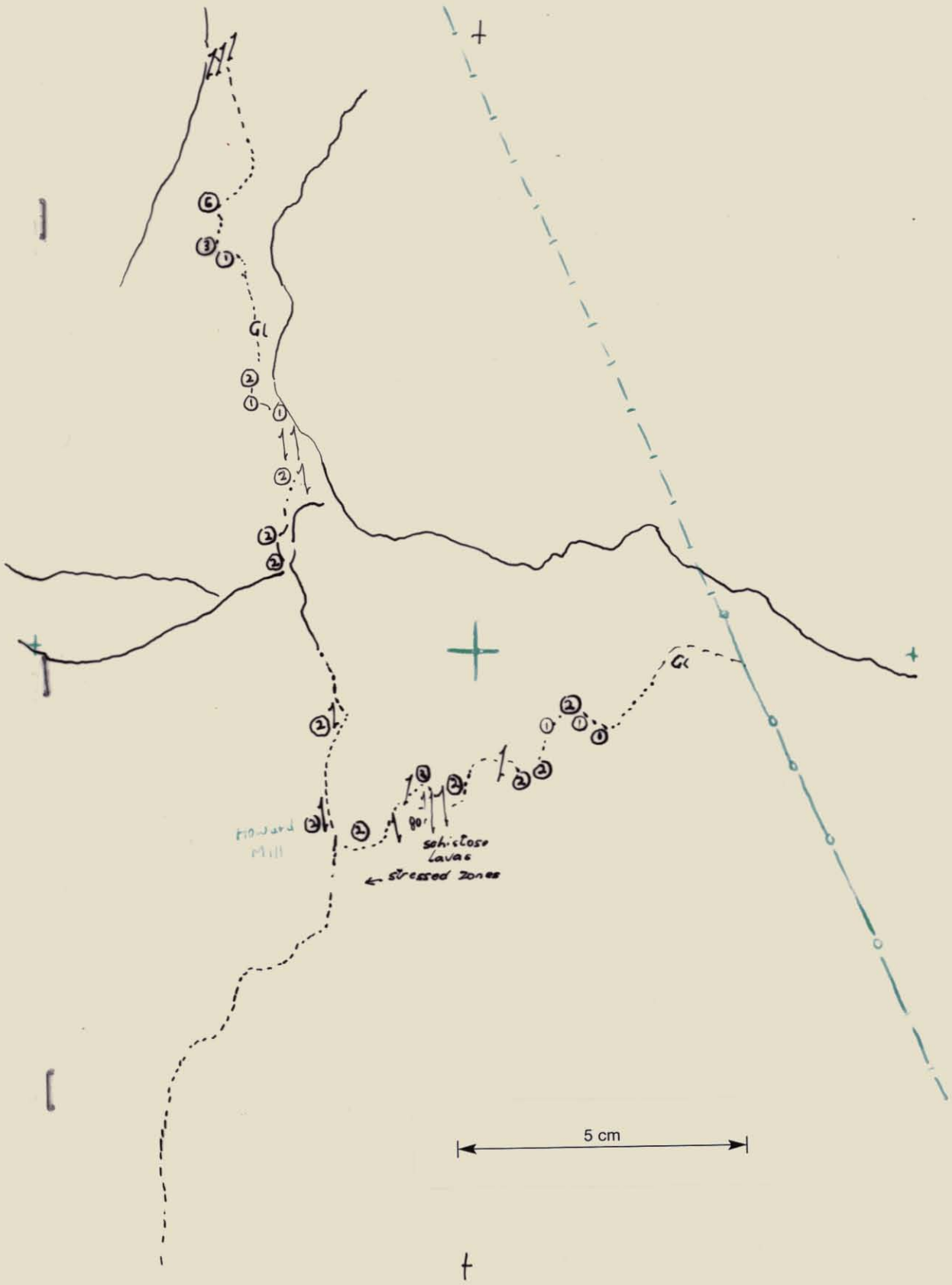


↑ RUN II MURCHISON 31272

MURCHISON II — 31273

446209

037

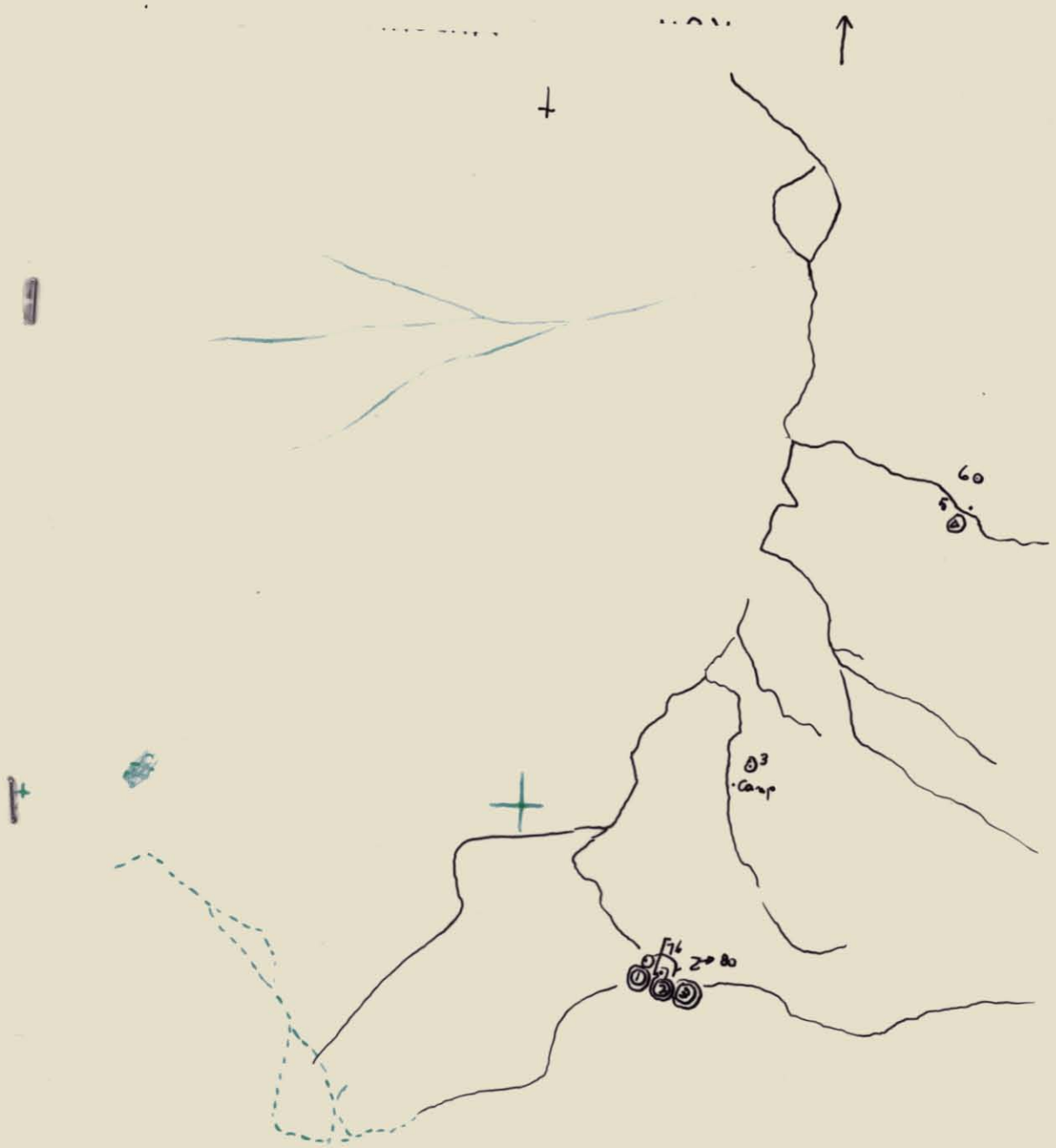


↑ RUN II MURCHISON 31273

038

MURCHISON 12 — 31282

446210



5 cm

DREW & MATTOCKS (13-3-57)

1. Sterling Mine Shaft. In cutting are black pyritic slates strongly sheared & contorted ē drags. Cleavage & bedding? (...) str 15° and 76° E. Drags pitch 80° in dir. 90°. (2)
2. Sterling Mine · 2 Adits & 1 Shaft. Ore is PbS & ZnS in crushed slate, qz, & py. ... Schist ... sheared tuff ...

(2) & (3)

No ocp from 2 to 4 going ... Thick dense vegetation & peaty soil 20+ thick. Large (up to 20') boulders of Owen Cgl in creek.

5 Qtz-schist ocp on tram track schistosity strikes 170, Dip 75W (4)

6 Sheared chlorite ~~tuff~~ schist with qtz veins ½" wide. Strike & dip as for 5 (5)

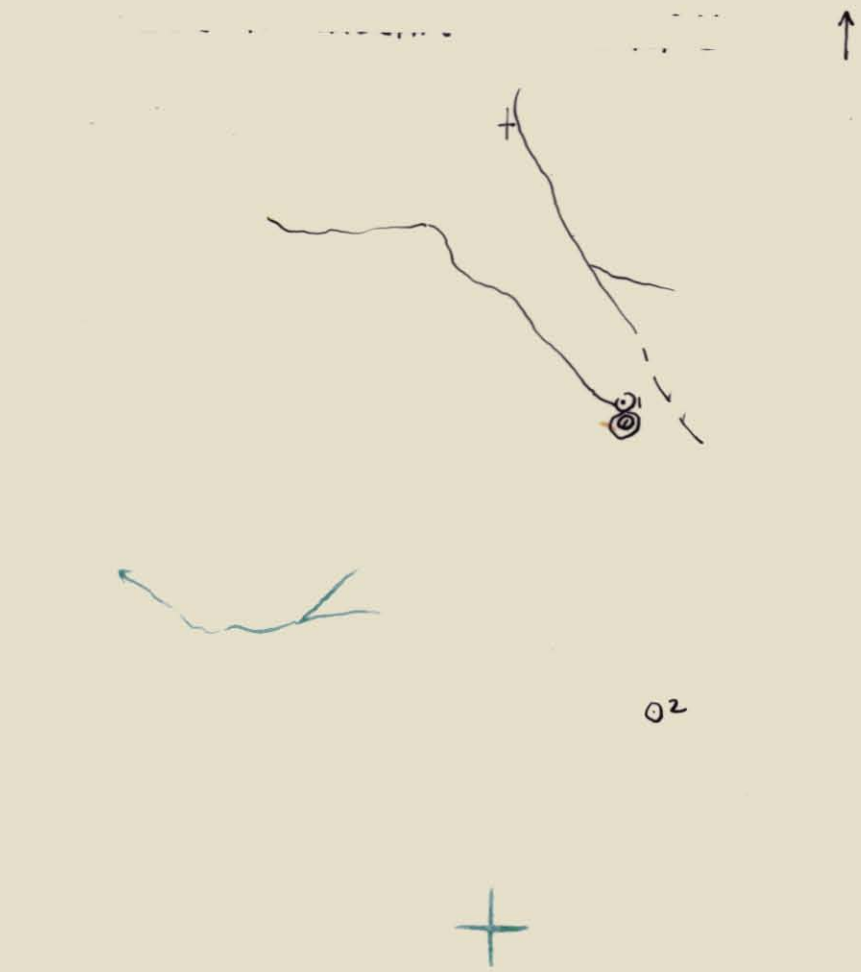
Murchison ~~L. Zn~~ Run 2

31282

MURCHISON 12 — 31284

040

446212



041

446213

Clark & Drew 29:3:57.

① Quartz-felspar-chlorite rock. Fresh surface is green. ? felsite. sp①

② Quartz-felspar-chlorite rock. Weathered surface pinkish, fresh is green.

③ Quartz-felspar-chlorite rock ± phenocrysts qz. sp. ②

N.B. Rocks from ② to ③ all altered by felspathisation and fairly similar now.

Richardson Lee 2.

31284

RIO AUSTRALIA EXPLORATION PTY. LTD.

042

MURCHISON 12 — 31286

446214

446215

043

1. Pink granite, similar to White Hawk samples.
2. Grey granitic rocks medium grained, blocky outcrops
3. Bedded sequence, but metamorphosed. Charts, breccia conglomerate, and greenish microcrystalline siliceous rocks.

Prospecting Lease 12

31286

RIO AUSTRALIA EXPLORATION PTY