688001 TCR 96-3903

EL 32/90 MONTAGU PLAINS

RELINQUISHMENT REPORT

TO THE DIVISION OF MINES

MINERAL HOLDINGS AUSTRALIA PTY. LTD.

by

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Kingston Beach

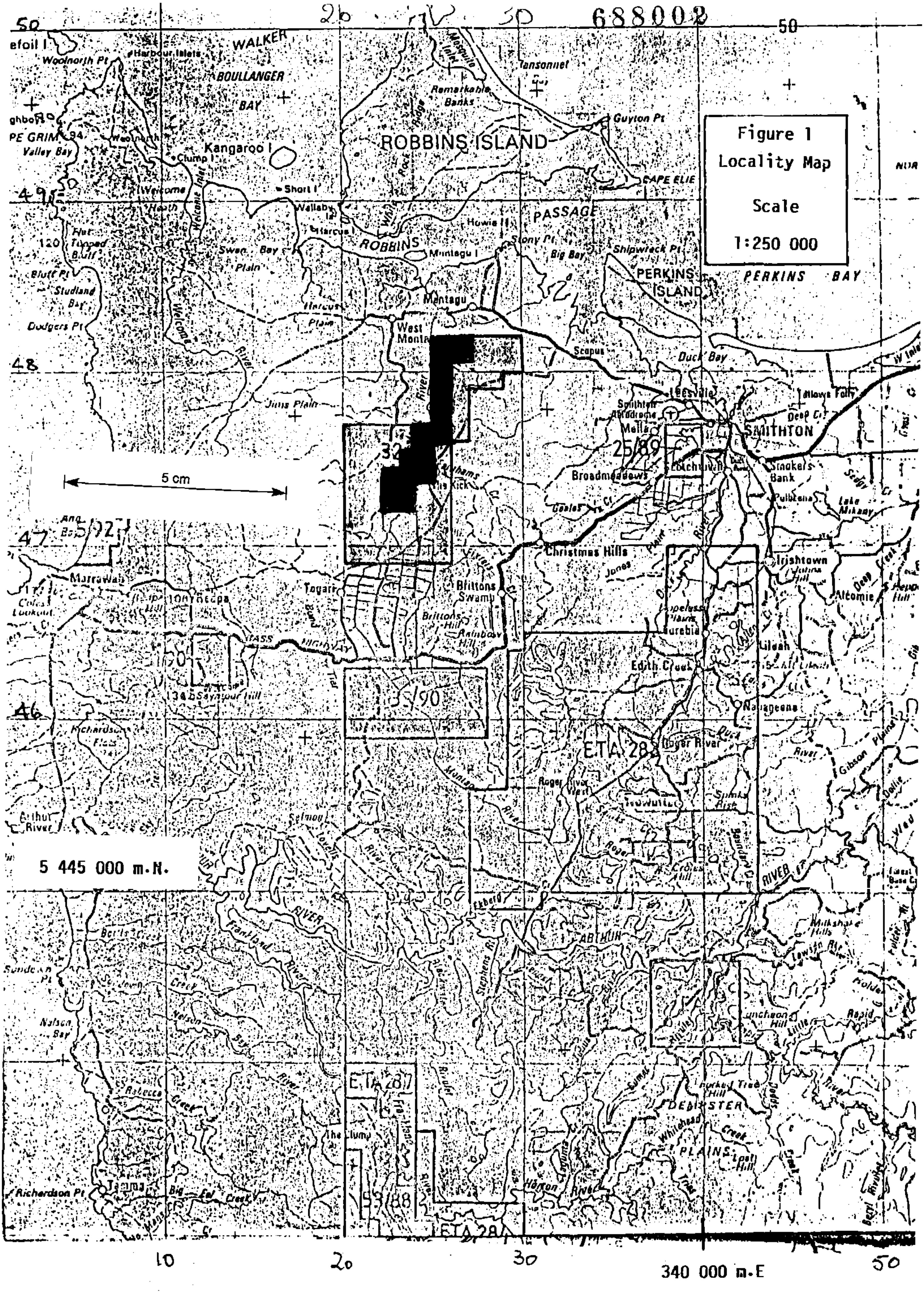

Figure 1
Locality Map
Scale
1:250 000

688003

CONTENTS

Reprint of Unpublished Manuscript.presented toANZAAS Congress.Hobart Tasmania May 1976.:

Murray P. & Goede A.Pleistocene Vertebrate Remains From A Cave Near Montagu NM Tasmania.

Introduction

This licence was issued on 3 May 1991 to Mineral Holdings Australia Pty Ltd to explore for high purity dolomite for use in the metallurgical and chemical industries.It was reduced from 67 to 15 S.Km. in 1994.and relinquished in 1996.

It lies between the rural settlements of Montagu in the north and Togari in the south and is situated around 30 Km. west of Smithton.

Access is by way of Bass Highway,Montagu Road and Barcoo Road.Much of the area is low lying and only accessible during dry seasons.The mean annual rainfall is 1250mm.

Geology

The area lies within the recently published Woolnorth geological map sheet and acknowledgement is made to D.Seymour for information and helpful discussion.

The bedrock structure is a folded sequence of Eocambrian and Precambrian sediments which brings the Smithton Dolomite to the surface in the Redpa,Togari - Montagu and Smithton areas.

The Smithton Dolomite is pooly exposed,the main outcrop areas are along the banks and in the stream bed of Montagu Riverand is only exposed during periods of low river level.It crops out in dense forest owned by Northern Forest Products P/L on the west bank of Montagu River (Fig.2).Four samples were taken from this area in 1991 (Table 3B).This area contains an assemblage of megafaunal remains (Murray & Goode-1976) and NFP has declared a Cave Reserve around it.This Area does not have official recognition but the site is of scientific significance and should be preserved; furthermore,mining of it or in its proximity is unlikely to be approved.

Exploration

Four rockchip samples were taken from the Cave Reserve,by permission of NFP,and analysed (Table 3B) in 1992.

Twentytwo backhoe pits were excavated (Tables 1 & 2 and Figure 2) in 1995.

Chemical & Physical Characteristics

Most industrial applications of dolomite involve calcining and it is important therefore that the raw material has the right strength and crystallinity for furnace feed.The following notes attempt to assess the quality of the material obtained from the backhoe and surface samples.

Strength

In all chiprock samples,both from outcrop and from sub-outcrop in backhoe pits,the dolomite was extremely difficult to break with hammer and chisel and gave the impression that,in terms of strength the material would meet specification.

CHEMICAL PURITY :Although specifications vary according to the end use of the material, a low level of contaminants is necessary for most uses; in the highly competitive world market for Industrial Minerals it has become essential . The main impurities in the dolomite are: 1)Silica occurring as quartz veins and possibly in other forms such as silicates. 2)Iron,occurring as iron oxides but it may also be present in the crystal lattice of the dolomite.Deposits of iron oxides,locally called "Blows", occur throughout the area.They are thought to be spring deposits, sometimes in mounds 2-3m.high and probably associated with artesian water .The extent to which iron rich waters from this source would have contaminated the dolomite is not known. 3)Calcite is frequently (almost invariably) present in the dolomite, usually as infilling of veins and vugs probably due to solution and redeposition by and from meteoric water Calcite may also occur within the dolomite lattice or around grain margins. Acid reaction has been observed in most of the samples tested .The theoretical CaO/MgO ratio for dolomite is 1.40,a higher ratio indicates the presence of excess calcium usually in the form of calcite.A value of 1.7 indicates a 10% calcite content which,for a number of end uses is unacceptably high.The ratio has been calculated for each of the sample analyses in this report (Table).To date no pattern of distribution has become apparent.Except to note that the ratio is higher in these three licences than it was in the Smithton area.It is also noted that these licences appear to located lower in the Smithton Dolomite(stratigraphically) than is Smithton.however this may not be so and of no significance if it is.

GRAIN SIZE: Coarsely grained carbonates have been found to decrepitate at high temperatures,which limits their use in the metallurgical industry.The most desirable grain size is in the −10μm.range (micro -& crypto-crystalline) Table 5 sets out the Wentworth grade scale and the grain size nomenclature employed for carbonate rocks by Bissett & Chilinga (1967). Estimation of grain size is difficult and inherently subjective but bearing this limitation in mind,the following table,based on the size classsification of Table has been devised for use in the field.

688006

DESCRIPTOR	GRAIN SIZE (µm.)	CRITERION
macro.	>1000	estimate by eye
meso C	500-1000	" " "
" M	250-500	" " "
" F	50-250	" " "
FC	10-50	Grains can be distinguished with the aid of a hand lens.
micro	<10	Grains cannot be distinguished with a hand lens.
crypto.	<1	cherty texture.

This method has been employed in this report.Grain Sizes shown on the analysis sheets (Table 3) are descriptions by sample preparation staff at the laboratory are not made with reference to any standard and do not agree with descriptions in this report . They should be discounted.

A microscopic examination of a sample of dolomite from a bore hole drilled at Redpa was made by R.S.Bottrill(Annual Report for EL 31/90 1992). He found that the grain size lay in the range of 150-200µm. ,and that no cryptocrystalline material was seen in the thin sections examined. He classified the sample as mesocrystalline; In this report it is described as meso F.

Of 49 grain size estimations (Table 2) ,the distibution was : macro-4%,meso C-12%,mesoM-12%,mesoF-20%,,FC-33%,and micro-18%. Macro&micro constitute 50% of the total observations and FC&micro make up the other50%.

Many more observations are required both horizontally and vert ically before this approach can be assessed as an exploration tool.

Conclusions & Recommendations

Although it can be fairly confidentally predicted that a large resource of dolomite of acceptable quality occurs in this tenement,it would be difficult to prove because of the paucity of exposure and probably more difficult to mine because of the swampy nature of the country.

It is considered that further expenditure on this licence cannot be justified in view of the more favourable exploration potential in other neighbouring licences held by MHA.

It is recommended therefore that this licence be relinquished.

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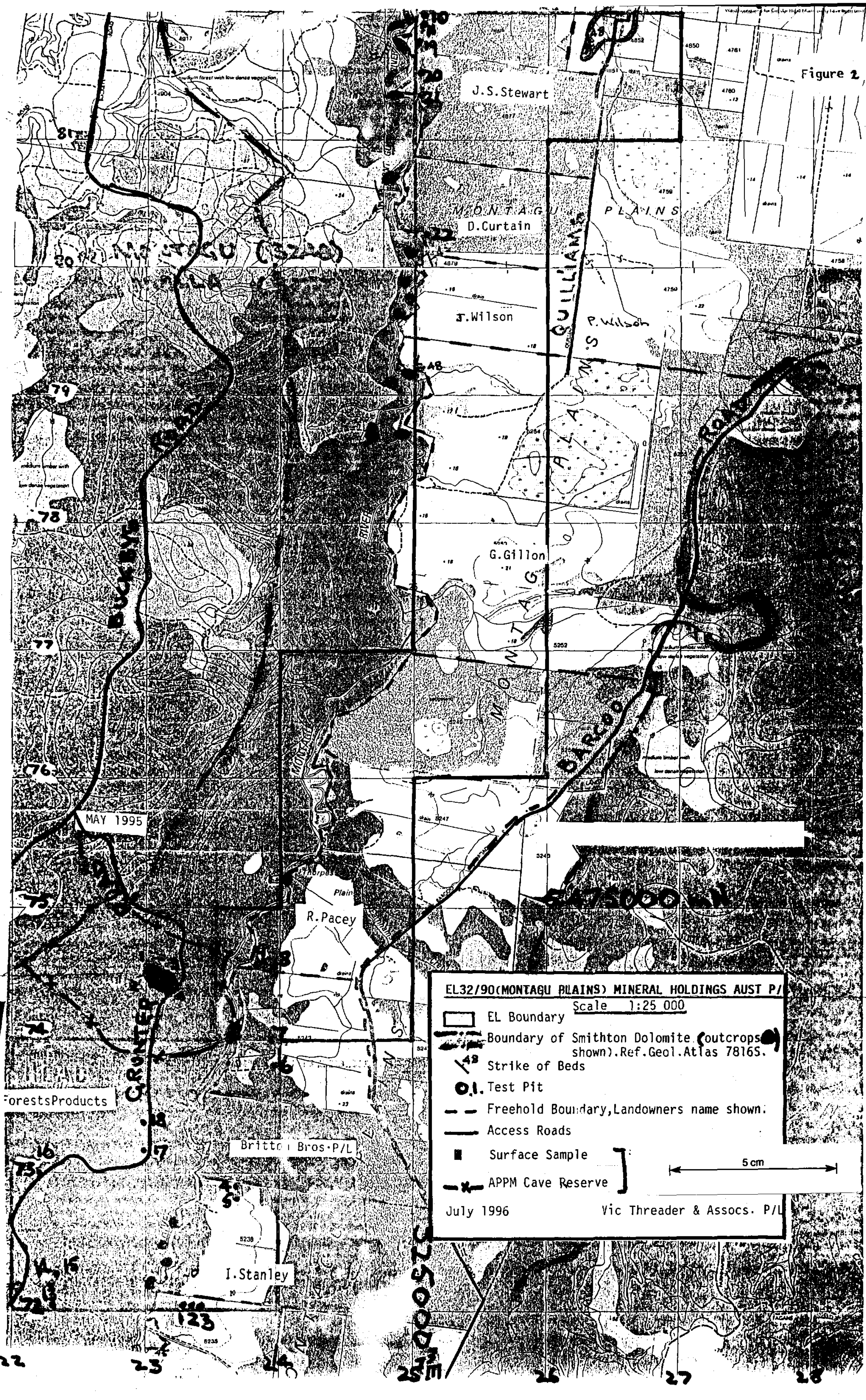
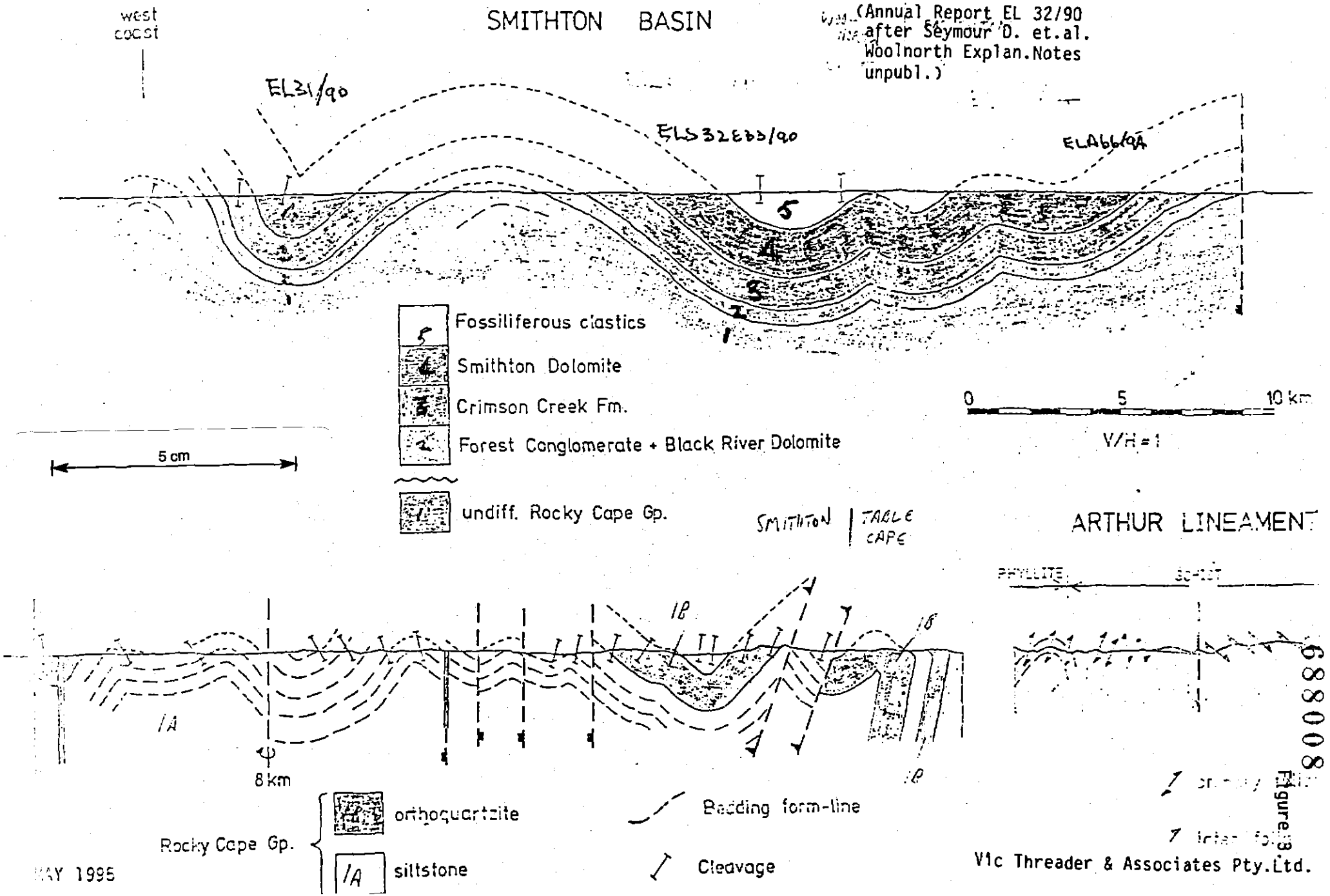


Figure 2
J.S.Stewart
D.Curtain
MONTAGU PLAINS
J.Wilson
P.Wilson
QUILLIAMS
G.Gillon
MONTAGU
BARCOO ROAD
BUCKEYE ROAD
GRUNTER
MAY 1995
R.Pacey
ForestsProducts
Britto Bros·P/L
I.Stanley
5475000mN
325000mE
EL32/90(MONTAGU PLAINS) MINERAL HOLDINGS AUST P/
Scale 1:25 000
EL Boundary
Boundary of Smithton Dolomite (outcrops shown).Ref.Geol.Atlas 7816S.
Strike of Beds
Test Pit
Freehold Boundary,Landowners name shown.
Access Roads
Surface Sample
APPM Cave Reserve
5 cm
July 1996
Vic Threader & Assocs. P/L

Figure 3



APPENDIX

688010 Table 1

AMG CO ORDINATES OF TEST PITS

No.	m.E	m.N
1	323300	5472000
2	350	"
3	400	"
4	700	900
5	700	800
6	950	3800
7	950	4000
8	980	4550
9	830	"
10	5050	82000
11	"	1900
12	2050	72200
13	300	000
14	300	200
15	300	300
16	250	3000
17	950	150
18	950	400
19	5050	81750
20	"	500
21	"	350
22	"	80250

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EL32 /90 (MONTAGU PLAINS)
BACKHOE PIT LOGS

Table 2.

NUMBER	DEPTH	OVERBURDEN	COLOUR	ACID REACTION	HARDNESS	GRAIN SIZE	
1	1.7	1.7	Grey	Strong	Hard	meso F	
2	3.0	3.0	Bluish grey				Strong fow of water at3.om. Hole too wet & unstable to sample.
	3	>3.3					
3	3.3	>3.3					Noorock,no water.
4	3.0	3.0	iron stained				Ironstone on dolomite. Strong flow of water at3.0m.
5	2.5	2.5	Grey				Soft dolomite.
6	3.0	>3.0					Sand only,no rock,no water.
7	3.0	>3.0					- - - - - -
8	3.1	>3.1					Boulder of grey dolomite at 3.1m.
9	3.1	>3.1					2m. of yellow clay & 1.1m. of grey sandy clay.Water coming at 3.1m. Norock.
10	2.0	0 8 to 2.0	Grey	Strong	Soft	micro	Solution cavities with clay infilling.
11	1.8	0.8	Ironstained at top.	Strong	Hard	micro	Soft dolomite.Sampled at 1.5m.
12	3.0	>3.0					Peat and sand to 3.0m. Hole abandoned.
13	1.4	o.9 to 1.4	Blue/Grey	medium	Hard	micro	
14	o.0	0.9	Grey	-	Hard	meso F	Extremely tough.only very small sample possible.
15	1.2	1.2	Grey	-	Hard	meso C	Well jointed easy to sample, but hard dolomite.
16	3.0	3.0	Light grey	Strong	Hard	meso M	2.2m.of black peaty clay 0.8m.of grey sandy clay water coming in at3.0m. Sampled from bucket.
17	0.7	0.7	Light grey	Medium	Slightly crumbly	F C	
18	0.9	0.9	- -	Medium	Hard	F C	Nodolomite to 1.5m. at other end of excavation.
19	0.9	>0.9					0.6m.of sandy soil & sand o.3m.of brown clay Water coming at o.9m. Hole abandoned.
20	3.0	>3.0			Soft		0.6m.of sandy soil 0.3m.of sand 2.40m.of sandy clay Soft dolomite.
21	3.0	>3.0			Soft		Black sandy clay with bands of sand.Yellow clay at 3.0m. Soft dolomite,sampled from bucket.
22	2.0	2.0	Grey	Strong	H	F C	0.3m.of brown sandy soil 1.7m.of brown sandy clay

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Table 3A

DOLOMITE 24/2/92

MINERAL HOLDINGS

REGISTRA NO.	SiO2 %	TiO2 %	Al2O3 %	Fe2O3 %	MnO %	MgO %	CaO %	K2O %	LOI %	YOUR NUMBER	No - Sample width
911333	0.26	0.01	0.16	0.45	0.01	20.90	31.03	0.01	46.76	EC 32/90 Conc. Area	1 - 2.2m
911334	0.21	0.01	0.13	0.49	0.01	21.34	31.17	0.01	46.96	"	2 - 3.3m
911335	0.41	0.01	0.01	0.33	0.01	20.05	32.29	0.01	46.73	"	3 - 4.0m
911336	0.14	0.01	0.01	0.45	0.01	20.29	31.28	0.01	46.68	"	4 - 5.0m
911337	0.35	0.01	0.01	0.17	0.01	20.60	31.67	0.01	46.65	EC 31/90 BH5	2.3 - 4.8
911338	0.57	0.01	0.07	0.14	0.01	21.89	30.82	0.03	46.56	"	4.8 - 7.2
911339	1.27	0.01	0.04	0.17	0.01	20.12	32.08	0.01	46.24	"	7.2 - 10.5

CHIEF CHEMIST : DAVID ZANI

32.71

MONTAGU PLAINS DOLOMITE EL.32/90
& SMITHTON EL.66/94

Prospect	Sample #	CaO %	MgO %	SiO_2 %	LOI %	Fe_2O_3 ppm	TiO_2 ppm	Al_2O_3 ppm	Na_2O ppm	Mn ppm	Cu ppm	Cr ppm	Ni ppm	Colour	Hard-ness	Grain Size	Ratio CaO:MgO
MONTAGU	BP 1	30.47	21.04	0.84	46.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	G	H	M	1.45
"	BP 10	28.47	20.00	4.10	44.88	12900	521	7890	1376	153	9	17	20	OW	H	F	1.42
"	BP 11	29.44	20.86	0.44	46.62	18520	244	4670	1210	223	6	16	20	OW	H	F	1.41
"	BP 13	23.65	15.85	23.80	36.14	1960	27	1070	989	80	5	4	14	LG	H	M	
"	BP 14	32.48	19.69	0.31	46.62	2425	50	1690	1266	41	6	11	19	LG	H	M	1.65
"	BP 15	32.51	19.46	0.13	46.92	947	57	1590	935	28	4	14	23	OW	H	M	1.67
"	BP 16	30.64	21.20	0.07	47.17	945	42	792	1058	62	5	10	25	LG	H	M	1.44
"	BP 17	31.15	20.32	0.51	46.72	1671	250	5350	917	49	5	7	17	OW	H	F	1.53
"	BP 18	31.50	19.79	1.14	46.62	1976	76	1810	728	57	6	4	15	LG	H	F	1.59
"	BP 22	29.86	20.40	0.92	46.34	10350	469	8300	864	139	7	17	18	G	H	F	1.46
"	DC 5	49.57	4.97	<0.05	44.46	1581	23	370	588	60	5	5	15	G	H	F	
"	R7	28.68	20.21	4.58	44.76	7840	146	2890	1060	78	6	13	19	LG	H	F	1.42
Roger River	Outcrop	30.65	20.93	0.06	46.99	8060	78	1200	719	775	6	15	41	LG	H	F	1.46
Smithton	QR2105	30.41	21.40	0.40	46.97	2268	125	3060	1165	54	4	7	16	LG	H	F	1.42

*Roger River is several km's south of El.33/90 near Trowutta

LEGEND:
LG = LIGHT GREY G = GREY OW = OFF WHITE H = HARD F = FINE M = MEDIUM
BP = Backhoe Pit Montagu Plains
DC5 = David Curtain's property at Montagu Plains
R7 = Montagu River Outcrop
QR = Quary reserve 2105 Smithton as mapped by Dept Mines.

Sampled: April, 1995

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Table 3.6

GRAIN SIZE NOMENCLATURE

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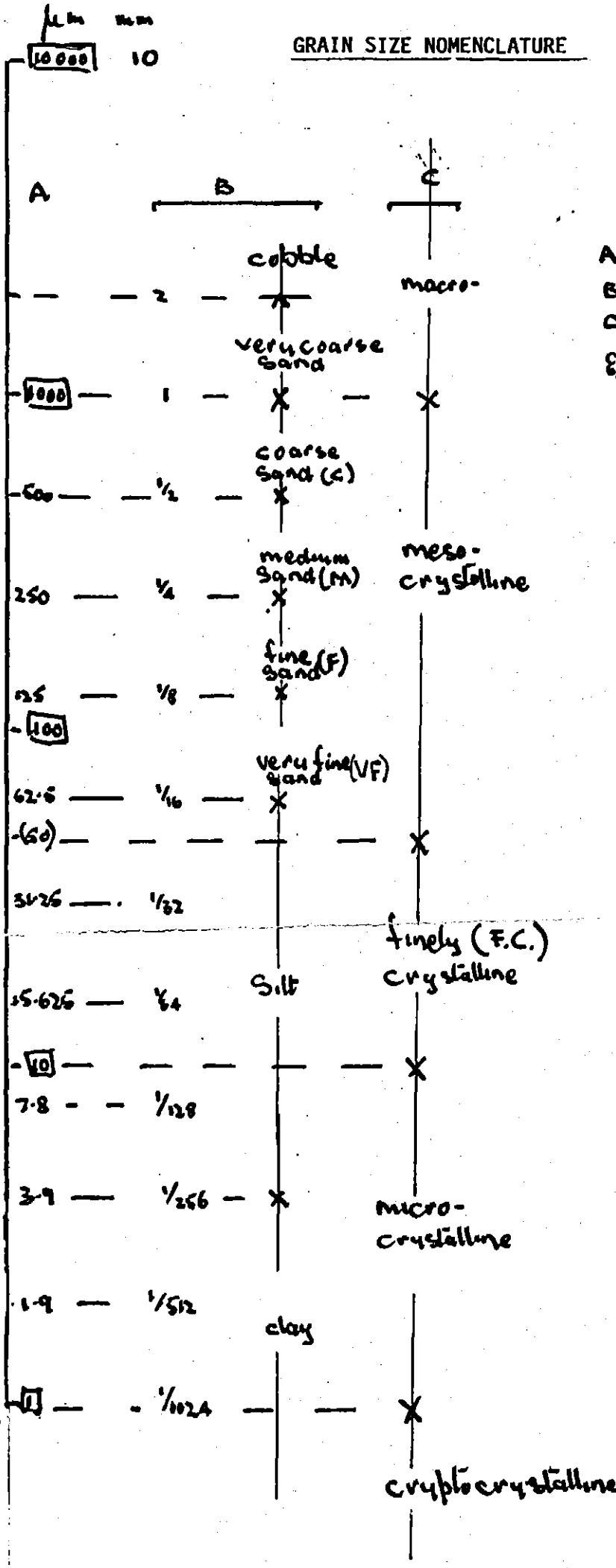
Table 4.



A: Logarithic scale (μm)
B: Wentworth Grade Scale (mm)
C: Crystallinity scale (Bissett H.J. & Chilingar G.V. in: "Carbonate Rocks" Elsevier 1967)

Extract from:

Unpublished Manuscript

688015

Paper presented at the 47th ANZAAS Congress, Hobart, Tasmania, May 1976.

PLEISTOCENE VERTEBRATE REMAINS FROM A CAVE NEAR MONTAGU, N.W. TASMANIA

by

Peter Murray*

and

Albert Goede*

ABSTRACT

The results are presented of a study of vertebrate remains and associated sediments found in a small, recently discovered dolomite cave (MU-206) in north-western Tasmania. A list of species identified to date is presented and the geochronological and palaeoecological significance of the fossils is indicated.

A description is given of the evolutionary history of the cave and the character of the cave deposits is examined. This is supplemented by an assessment of the condition, completeness and relative position of the fossil material from the site.

PHYSICAL SETTING

Tasmania is a mountainous island with numerous small areas of karst, located predominantly in the high rainfall zone of the western half of the state.

* Department of Anatomy, University of Tasmania
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The Montagu karst consists of two small Upper Precambrian dolomite hills rising to a maximum height of six metres above a marshy plain near the Montagu River (figure 1). It is located in the centre of an extensive coastal plain with the land sloping gently northwards towards Bass Strait. Local drainage also trends in this direction.

The area has an extensive veneer of Pleistocene and Holocene sediments ranging from shallow marine and estuarine deposits to aeolian, alluvial and paludal sediments. The Pleistocene cover is interrupted by ridges and isolated outcrops of basement rocks which are predominantly Upper Precambrian and Cambrian in age. A description of the regional geology is given by Gulline (1959). The Precambrian outcrops consist of quartzites, conglomerates and dolomites (Smithton Dolomite) and are widespread. Cambrian rocks include siltstones, tuffs, greywackes, breccias and conglomerates as well as some basic volcanic rocks.

Marine and freshwater Tertiary sediments, including limestones, are of limited extent. They are generally flat-lying in contrast to the strongly folded Precambrian and Cambrian rocks. Outcrop of Tertiary basalts occur locally but are extensive only in the south-east corner of the area shown in figure 1.

Pleistocene high sealevels are indicated by the presence of raised shorelines associated with shallow marine deposits and relict coastal dunes. Further east, three raised shorelines described by Chick (1971) are suggested to be of Last Interglacial age. The highest stands at approximately 20 metres above higher high water mark. Regression of the Pleistocene sea from maximum levels is indicated by extensive series of beach ridges. Some of the older series have been almost completely buried by subsequent peat accumulation.

Artesian springs occur locally in association with deposits of peat and freshwater algal marl. Those near Mella (Mowbray Swamp) are associated with well developed spring mounds. Both the Mowbray and Pulbeena springs are characterized by a very high carbonate content (400 p.p.m. at Mella and 750 p.p.m. at Pulbeena) indicating the presence of dolomite below the Pleistocene sediment cover. Pleistocene vertebrate remains have been recovered from both sites (Gill and Banks, 1956; Hope, 1973). Remains have also been recorded from a small dolomite cave (Scotchtown Cave) discovered near Smithton during mining operations in 1942.

The Montagu area is located approximately 41° South and 140° East. It is characterized by a mean annual temperature of approximately 13°C. The mean temperature of the warmest month (February) is close to 17°C while the mean temperature of the coldest month (July) is just above 9°C. The mean annual precipitation is 115 cm with a winter maximum. Not less than 35% of the annual precipitation falls in the three winter months (June-August) but only 15% during the three summer months (January-March).

The Montagu karst is within a wet sclerophyll forest giving way to swamp associations in poorly-drained portions of the surrounding plain. Three caves are known in the area. All contain deposits which include vertebrate remains. Main Cave (MU-201) and Pleisto Scene Cave (MU-206) are located on the western side of the Grunter Road, while the third, an unnamed cave (MU-203) is found in a dolomite outcrop on the opposite side of the road. The direction of dip of the dolomite is SW with the angle of dip varying from 35° to 58°. All the known cave entrances are located on the anti-dip side of the hills where they rise steeply from the surrounding country to form low cliff faces up to 5 metres high. The opposite south-east facing slopes merge gradually into the plain.

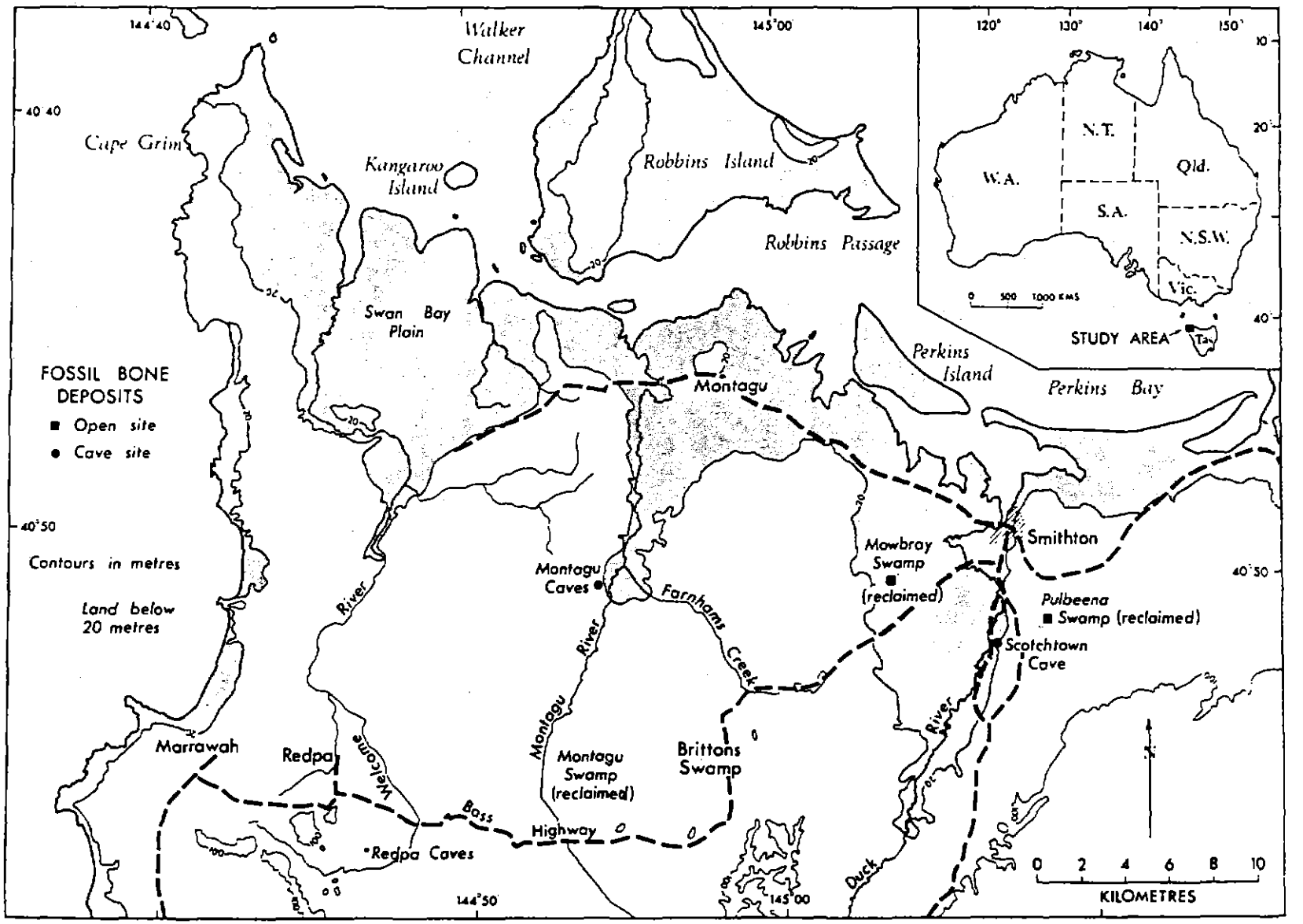

Figure 1 Location map of northwestern Tasmania

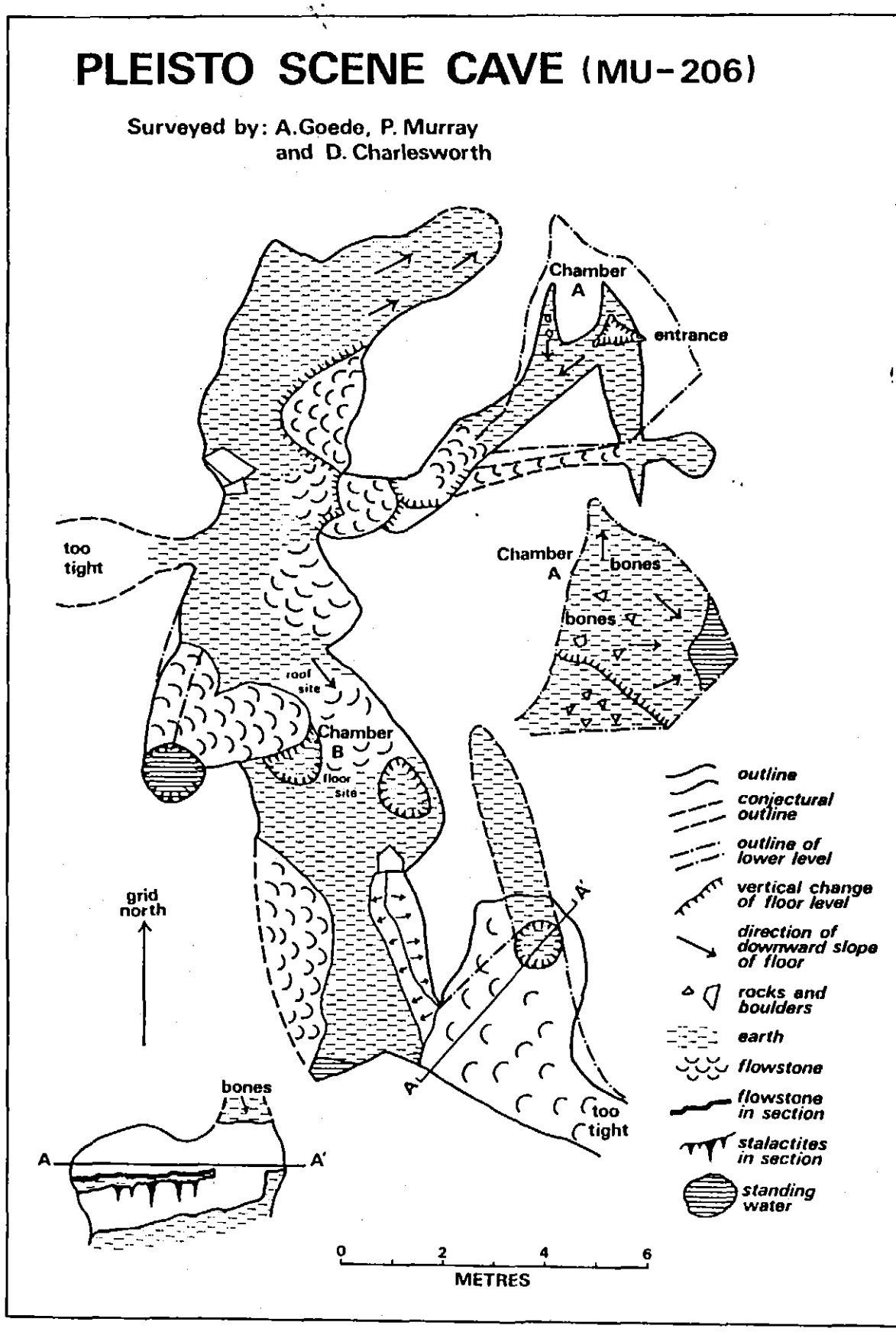

Figure 2 Survey of Pleisto Scene Cave, Montagu

5 cm

Fig. 10

Sketch of the Montagu area and its inhabitants during the period of time represented by Bed 3B. Note fallen animal, and rodents, onlooking scavengers near the entrance of the shaft.