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A Central Australian Ochre Mine

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ABSTRACT. An ochre mine still used by Warlpiri men in central Australia is described, and its relationship to trading networks, mythology and control over access is discussed. The paper also examines the methods of mining and processing the ochre, and describes some task-specific stone tools used in mining. Many similarities are apparent between this mine and two famous large ochre deposits, Parachilna and Wilga mia, neither of which is currently in use.

It is of particular interest for three reasons: there are stone tools used specifically for quarrying the deposits; the entire mine is an underground chamber; and it provides ethnographic evidence on the complexities of the control of such valued resources.

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KEYWORDS: Aborigines, anthropology, prehistory, ochre, mining.

Red ochre is one of the most important minerals mined by Aboriginal people. It is used as a pigment for a variety of artistic and decorative purposes: it adorns the human body during ceremonies; it is one of the main pigments used in rock art; and many items of wood and stone, including some shields, boomerangs and clubs, are liberally coated with it. The antiquity of its use throughout Australia is demonstrated at a number of archaeological sites. At Kenniff Cave in Queensland, red ochre was found in all levels dating back to the earliest occupation some 19,000 years ago. It was also found in basal levels of similar age at other sites including Miriwun in the Kimberley district of Western Australia, sites in Arnhem Land, and Cloggs Cave in Victoria (Mulvaney, 1975: 155). But the earliest, and most spectacular, evidence for its use comes from the Lake Mungo site in western New South Wales where the body of a man who died some 30,000 years ago had been coated with red ochre at the time of burial (Bowler & Thorne, 1976: 129).

Usually, red ochre is dug out of the ground from small pits, in nodule form. Although ochre deposits are common throughout the continent, certain kinds of red ochre are more highly valued than others and are important in Aboriginal mythology. In the case of the Parachilna mine in the northern Flinders Range, red ochre, said to be the blood of a sacred emu, was famous over a wide region of central Australia. It was so eagerly sought that Dieri speakers living 500 kilometres to the north sent armed parties of 70–80 men through hostile territories in order to barter for ochre from the mine's owners (Howitt, 1904: 711). To such people, Parachilna ochre was "considered the 'proper' ochre and is that which is always used, although plenty, hundreds of miles nearer, could easily be obtained" (Horne & Aiston, 1924: 34). It is possible that the Dieri needed the ochre, not only for their own ritual purposes, but also to use in trade with people to the north from whom they obtained pituri (see Watson, 1983: 31–32).

Usually, these highly valued ochres have a silvery sheen caused by an admixture of some other element such as free mercury (cinnabar) in the case of the Parachilna (Bookatoo)[1] ochre deposits, or tiny fragments of mica in the case of the deposits described here. These more valued deposits, the two best known of which are Wilga mia in Western Australia and Parachilna, have been quarried on a grand scale.

The scale of excavations, quite apart from the ethnographic evidence, suggests that the material must have been widely traded, reflecting the significance of red ochre throughout the continent, including Tasmania (Robson & Plomley, 1982). The Wilga mia open cut excavations, for instance, are between 15 and 30 metres in width and up to 20 metres deep, with chambers around the bottom (Davidson, 1952: 82–83), in an area with an estimated population density of only one person per 52 square kilometres. Similarly, the Parachilna mine is an open cut type measuring some 12 metres by 23 metres with six tunnels into the hillside, all but one of which has caved in (Broughton n.d.). While in both these cases regular exploitation of the deposits appears to have ceased by early this century, the mine to be

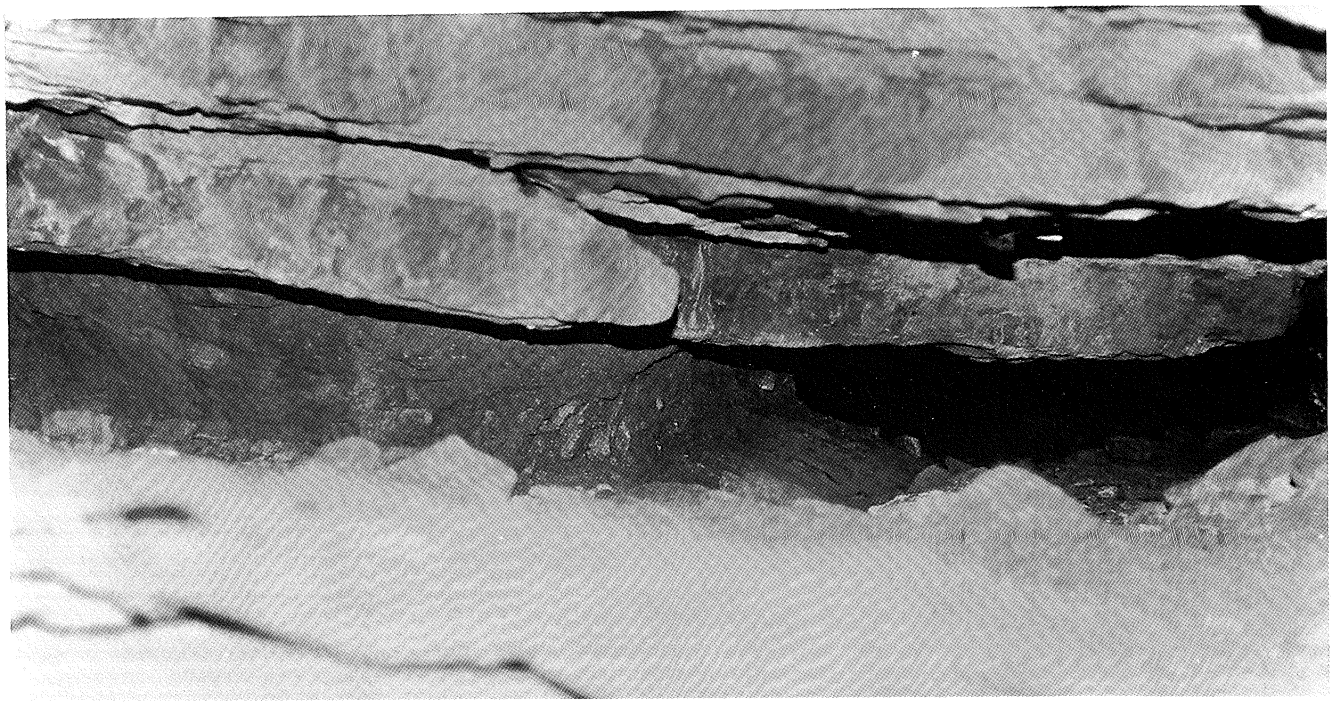


Plate 1. The beginning of the northern shaft from the middle of the central chamber.

described here is still in use. It is of particular interest because there are stone tools used specifically for quarrying the deposits, and the entire mine is an underground chamber.

The Central Australian Mine

The mine is located in the Campbell Ranges in the southern portion of Warlpiri country. As elsewhere in the region, the ranges are a white and pink quartzite which is tough, thickly bedded with basal coarse, pebbly, hematitic sandstone and pebble conglomerate (Wells, 1972: 6), originally deposited in a shallow marine environment. There is a small fault in the region of the mine and, although the geological map shows horizontal bedding, the mine entrance slopes down at approximately 25° in apparent conformity with the bedding of some of the surrounding hills. The deposit itself is a soft specular hematite bedded in conformity with the bedrock in a seam about a metre thick.

Located near the top of a low hill, the entrance to the mine is a small hole, 1.0 x 0.6 m, that leads directly into the central chamber. Figure 6 provides a sketch plan of the mine. The central chamber is approximately 9 x 12 x 1 m and off this, running almost due north, is a horizontal shaft 20 x 5 x 1 m (see Plate 1). To the south of the central chamber is a second, smaller chamber approximately 6 x 6 x 1 m. The empty space measures approximately 240 cubic metres and appears to have all been originally occupied by the ochre ore so that approximately 300 tonnes have been removed. Nowhere are there any roof supports, nor do there ever appear to have been any. The only sign of a roof fall is a large slab, directly inside the entrance, over which one crawls when entering the central chamber (see Plate 2).

The ochre deposit extends from floor to ceiling. Today it is worked with the aid of electric torches and small metal axes, hammers or metal digging sticks. The miners kneel on their heels or sit cross-legged in front of the face and hack at it with the axe, hammer or stick to create a pile of lumpy powdered ore in front of them (see Plate 3). Sometimes it comes away in quite large consolidated blocks. In the past, people lit fires inside the mine, and charcoal and pieces of wood can be seen on the floor in Plate 4. It would be possible to work the central and even southern chambers without artificial light at a pinch, but not the long northern shaft. In the past, stone choppers were used to hack at the ore, and these now litter the floor.

Five of the tools were taken for closer examination (Figs 1-5). The lack of either formal shape or edge preparation shows that they are simply naturally fractured blocks of quartzite, probably from the scree slope just outside the mine's entrance, chosen because they have reasonably sharp edges and are of adequate weight. The entire surface of each tool is coated with red ochre and the edges are heavily damaged through use. Typically, this use damage takes the form of haphazard, bifacial flake scars along the working edge, accompanied by a dull polish at the very apex of the edge (Plate 5). Under magnification, this gloss is seen to be made up of the polished surfaces of thousands of individual quartz grains; no striations are visible. Resulting from use damage, the flake scars are highly varied in size, shape and spacing. This is quite unlike the even pattern of flake removal from deliberately

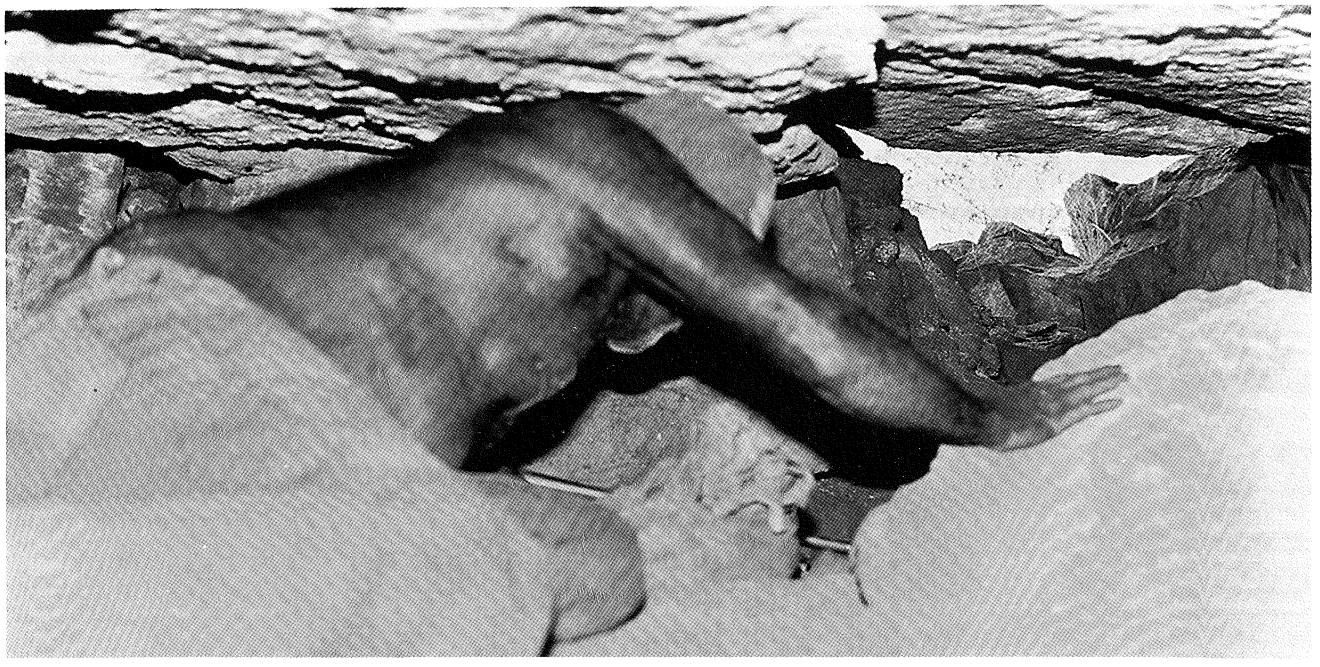


Plate 2. Crawling towards the entrance over the roof fall.

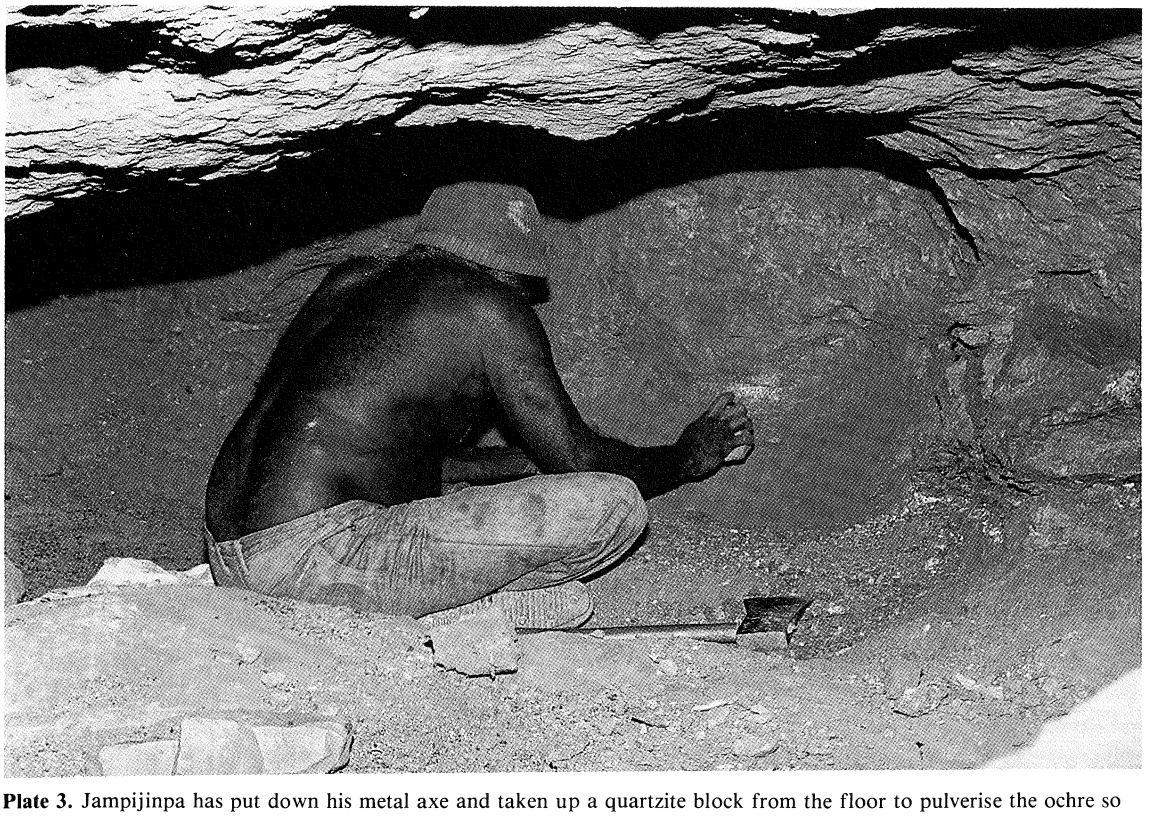
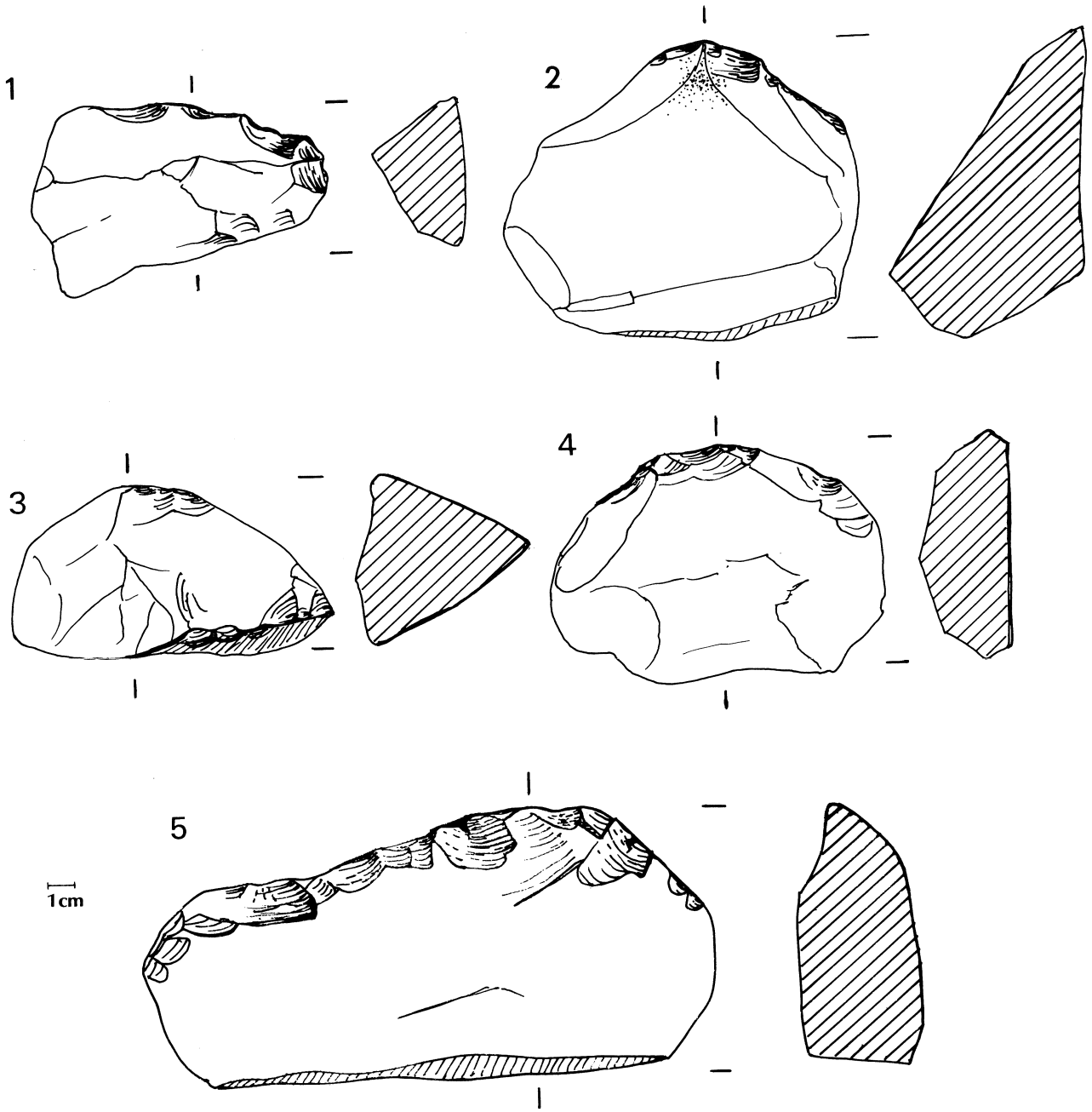


Plate 3. Jampijinpa has put down his metal axe and taken up a quartzite block from the floor to pulverise the ochre so that he can ascertain the quality of the ore at this spot.



Figs 1–5. Five stone choppers used for quarrying the ochre.

prepared edges. The basic measurements of the five stone tools are set out in Table 1:

	Length (mm)	Breadth (mm)	Height (mm)	Weight (gm)	Edge Angle
1	144	103	43	800	81
2	130	86	67	600	75
3	158	126	80	1740	77
4	233	114	62	1830	86
5	149	104	76	1100	88

The general characteristics of the tools and their location on the floor of the mine are reminiscent of Wilga mia:

"In the tunnels and strewn upon the bottom of the open cut are hundreds of crude, unshaped stones, two or three times the size of the fist, which still serve as hand mauls for battering away the solid matrix in which the prized ochre is imprisoned" (Davidson, 1952: 83).

Mined ore is today placed in flour or sugar bags and plastic buckets. In the past it was carried in deep wooden dishes, *ngami*, used for transporting water, or temporary bark dishes created from the bulbous growths

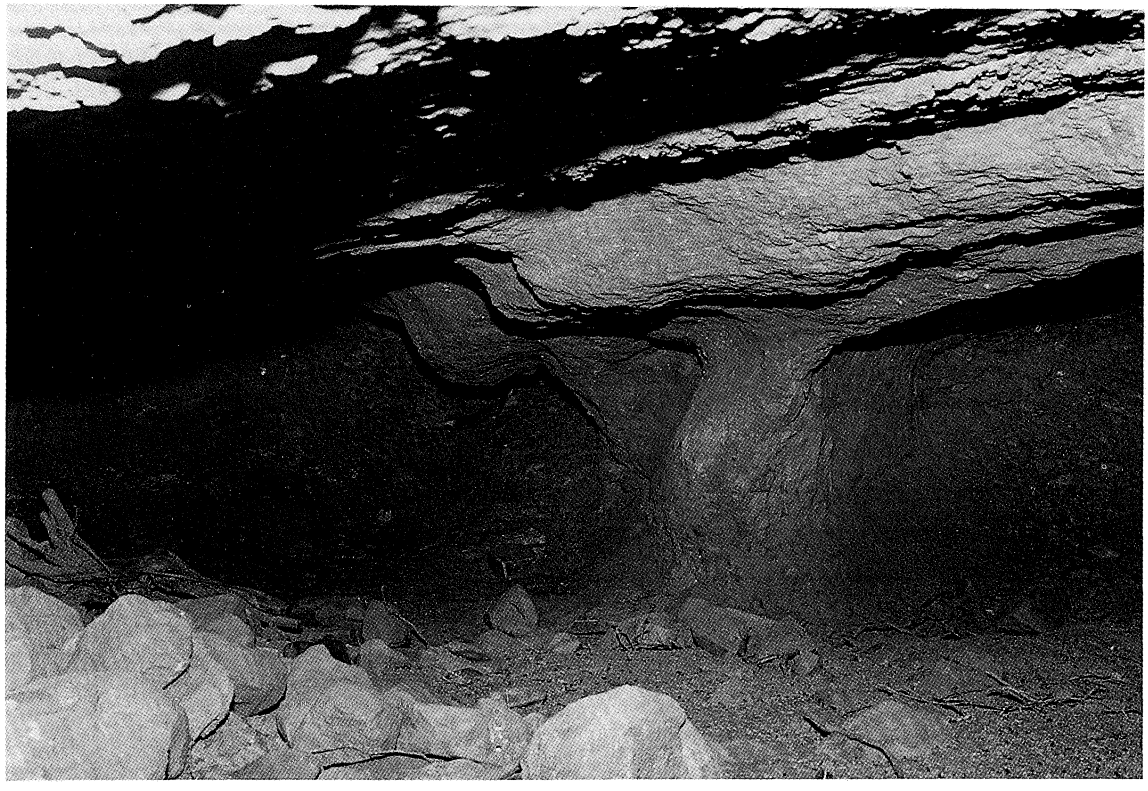


Plate 4. The seam of ochre can be clearly seen running from floor to ceiling. Unburnt sticks and chunks of quartzite cover the floor. This is the southern chamber.

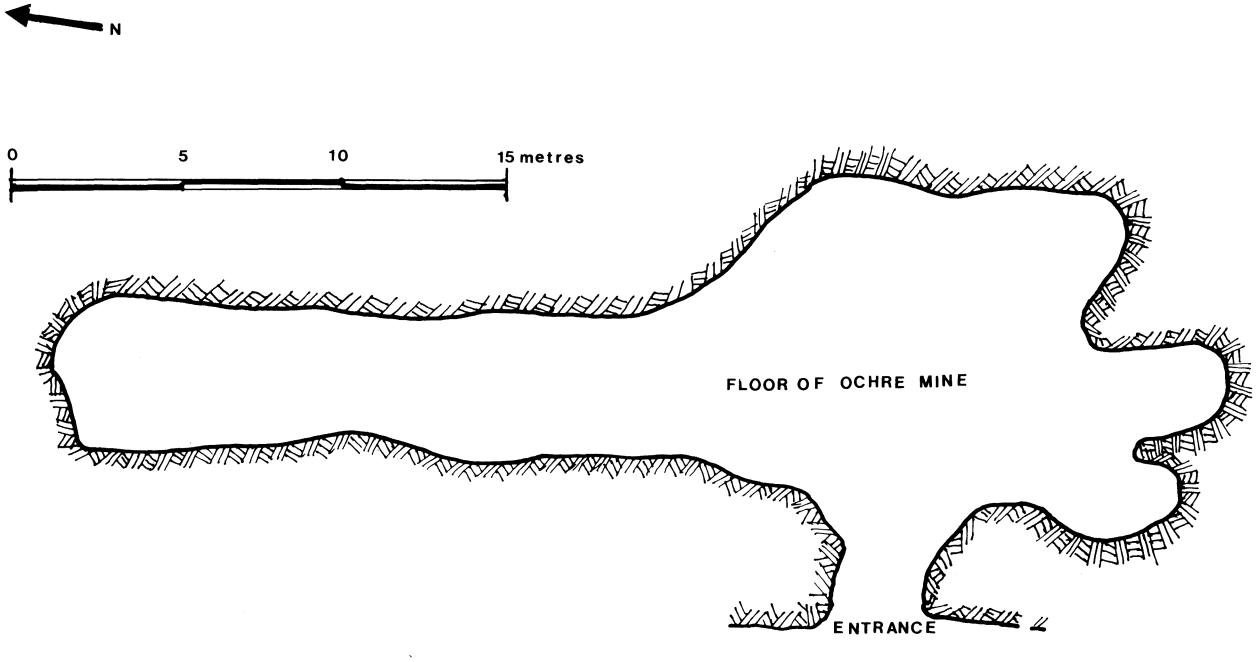


Fig. 6. Sketch plan of mine.

on the side of large eucalypt trees. It is clear from the three grinding grooves immediately outside the mine entrance that it was not unusual for initial treatment of the ore to take place on the spot. This involved simply grinding the ochre into a fine powder by hammering and rubbing. Because any minor impurities or slightly inferior ochre would be left behind, such a practice would mean that more ore could be carried away. Back in camp the ochre is further treated by mixing with a little water and made into balls or cakes called *kapardu*. Kimber reported that in 1932, or thereabouts, the balls were wrapped in ti-tree bark forming bundles slightly smaller than a basket ball (Kimber, letter 18 March, 1980).

This process is similar to that used by the Dieri when preparing Parachilna ochre for transportation. After excavation the ochre was mixed with water, shaped into 'loaves' about 8 kg in weight, and dried (Curr, 1886: 70).

The amounts collected by individuals, on the occasions when one of the authors has been present at the mine, ranged from 2 to 22 kg, averaging some 7.7 kg. An average size *ngami* dish measuring 50 x 18 x 13 cm (approx.) holds about 7 kg of powdered ochre and is a difficult load to carry down the hillside from the mine. Although it is not possible to obtain any accurate idea of the frequency of visits to the mine, on the basis that four people visited it twice a year and each obtained 7 kg the mine would have been in use for around 5,600 years.

Usually, it is men that quarry the ochre, and although no women are known to have been in the mine for the previous twenty years, a Nampijinpa woman of high ritual status entered the mine to collect ochre in 1983 in company with some Aboriginal and Europen men and a female anthropologist. Older men recalled that some of their female relations had quarried ochre in the past.

Local distribution of ochre. On returning from a visit to the mine in 1972 six of the seven Aboriginal members of the party, all men, gave the ochre to a range of relatives, as set out in Table 2. In all cases these were close relatives with the emphasis on members of the wife's matriline (*jurdalja*) and the wife's father, with each man giving to approximately six other people including wives and sisters. It is not known what variation there was in amounts given.

Ochre is widely exchanged today as it was in the recent past. Prior to the second world war it was exchanged for spears from the Erhenberg Ranges to the south, coming along what Terry (1934: 506) describes as a well defined route from Salvation Rockhole 32 kms, or so, east of these ranges, to the Campbell Ranges. To the north, it was exchanged for boomerangs, shields, large mulgawood fighting spears and hair string.

Linguistic relationships. The term commonly applied by the Walpiri to ordinary red ochre is *yurlpa* but this is not the term used for the ochre from the mine. This ochre is called *Karrku* which is the term used for red ochre by the Dieri (Dijari), Guyani, Ngamani and Yarluyandi, and cognate with the Arabana and Wangururu (Wongkanguru) term according to Luise Hercus (letter 27th April, 1983). George French Angas (1847: notes to Plate XXIV) reports the same term in use on the Onkaparinga River, east of Adelaide. The distance, as the crow flies, from the Warlpiri mine to Adelaide is over 2,400 kms, and to Leigh Creek, in the heart of Guyani territory, is over 1,100 kms. The linguistic evidence suggests links between these widespread groups in the past, but whether actual trade between them was involved is unknown.

Mythology. Before entering, it is common to call out to the old heroic ancestor inside the mine 'Don't be unpleasant to us'. On one occasion a man added, 'we only want a small amount' and on another it was emphasised that they had a European with them. There are some practical dangers, as the roof fall indicates, and the presence of snakes in summer and spiders is mentioned by the people. Although Lampert crawled to the end of the northern tunnel, on a later occasion Peterson was warned from going down it as a deceased Jampijinpa's spirit was said to be there and the whole tunnel was out of bounds.

The mythology associated with the mine is complex. The deposit was created by a Warlpiri man who stole ochre from an Alyawarra deposit, east of the Stuart Highway, and brought it west. The Alyawarra deposit was the congealed blood of a slaughtered man. On his journey home, the Warlpiri man stopped first at Warrinjirrinjirri (Crown Hill on Mt Allan Station), building a hut and placing the ochre on top. He stopped again at Yariyarriri, east of Newhaven Station, building a hut there too but this time he did not place the ochre on the roof. At the site of the mine he built a hut, placed the ochre on top and then went hunting, killing an eagle (*warlawurru*) and a python (*yurnturrkunyu*) which he cooked at a windbreak nearby. Almost all recounters of this story are agreed that this man was of the

	W	WB	WMB	WFZ	WF	MBS	M	MMB	S	B	Z
1	1	1	1	1	1	1	-	-	-	-	-
2	1	-	1	2	1	-	-	-	-	-	-
3	-	-	2	-	-	-	-	-	-	1	-
4	-	-	2	-	2	-	-	-	-	-	2
5	1	1	-	-	-	-	-	-	2	1	-
6	-	1	4	-	-	1	1	1	1	-	2

Table 2. Relatives to whom six men gave ochre on return from the mine. (Each number refers to number of relatives in that class)

Plate 5. A detailed view of the use damaged edge of one of the choppers. The sheen on the chopper comes from the ochre.

Jupurrula subsection (except the senior man of the Jampijinpa estate in the area, who said on one occasion that the man was Jampijinpa) and had removed the ochre from his head when he saw the rain dreaming coming from the west. Jupurrula returned to the hut/mine and entered it in the evening. Two women, Napaljarri and Nungarrayi, arrived from the west. They drank water at a small rockhole on top of the hill. The hill started to grow upwards so they threw a rope around it to hold it back but the top of the rock came tumbling down. The hill grew because it smelt the sweat of the two women. A Jampijinpa-Jangala rain dreaming, all tellers agree, came from the west, passing over the mine site. One elderly Jupurrula man commented that the two dreaming women tried to feel for the sources of the water that flowed down from the two rockholes on top of the hill. The rain dreaming went east to Gurner Bore and Mt Wedge before turning north to Kulpurlurnu.

Ownership. The mine site lies on the border of a Jampijinpa-Jangala and a Jupurrula-Jakamarra estate. While it is certain that permission has to be sought for access to the mine, there is some uncertainty whether this is the exclusive prerogative of the senior males of one or other of the estates, or shared between them. The fact that the mine lies on the intersection of several dreaming tracks, and that there are two implied origins of the ochre which attribute it to different sections of the same moiety, further complicates the issue, and raises the possibility of competitive assertion of rights to control access.

Peterson has visited the mine on three occasions between 1972 and 1982, with a range of people as set out in Table 3. On each occasion the senior man of the Jampijinpa-Jangala estate, designated number 1 in Table 3, was present and was the person Peterson was referred to for granting permission to visit the mine. However, on the first visit, the senior man (designated number 7) of the adjacent Jupurrula-Jakamarra estate was present, as were also 1's principal *kurdungurlu* ('managers' - designated 5 and 6). On the second visit 7 was not present but an influential man (8) of a Jupurrula-Jakamarra estate, some way to the north of the mine, was custodian (*kirda*) of the section of the widely important kangaroo dreaming track that crosses the Jampijinpa-Jangala estate in the north-south direction a few kilometres to the west of the mine. This man asserted that appropriate Jupurrula-Jakamarra people could hold ceremonies for the mine site. On the third visit, organised at short notice, 1 was again present with two other principal *kurdungurlu*: 12 the actual brother of 5, and 10 his actual father's sister's son.

Hiatt (1982: 24–25) has recently pointed out that monopolization of resources was rare in hunter-gatherer societies, and in Australia applies mainly to those that are scarce, valued and have some durability such as the products of quarries or pituri groves. It seems evident in the case of this mine that there is some competition to exercise control over access, although this is muted. Outright control is complicated by the very close relationships and obligations between those involved. Because 1, 2 and 10 are coresident on the Jampijinpa-

Jangala estate close to the mine they are in a *de facto* position to exercise a control, as all recognise they have a legitimate interest in the mine. Neither 1 nor 2 has ever claimed to us to be able to hold the ceremonies for the site. It was 8 who asserted the rites for the mine were Jupurrula-Jakamarra when 1 was present, although 8 himself did not claim to be the appropriate person to perform them. Nevertheless he did claim that it was his section that controlled the mine, and was not contradicted. At the time, 1 and 2 were indebted to 8 because they were living off a ritually important soakage on his dreaming track, although the general area around the soak was the two brothers' own estate. They were waiting for a bore to be drilled and equipped a little to the south and unequivocally on their own land: this they now have. 7, who seems to be the appropriate Jupurrula-Jakamarra estate owner to exercise control, since his country is adjacent to the mine, on the east, is not an influential man, is without other adult male members of his estate group and spends much of his time in Yuendumu so he is not in a strong position to unilaterally assert his rights. However, as the actual wife's mother's brother of 1, he is obviously in a position of some potential influence.

Thus, while there is some uncertainty over the control of access to the mine, it still remains very much a 'family' affair.

It might be that, as a highly valued but also highly localised resource, there has been an attempt to prevent too localised a monopoly by asserting a broader moiety interest, as the mythology suggests with its intersection of the Jupurrula man dreaming and the Jampijinpa-Jangala rain dreaming. The presence of the women further confirms this. Since nobody claims the deposit to be Jungarrayi-Japaljarri it would seem that an interpretation for the involvement of women of these two subsections might be, following Warlpiri aetiology, that the deposits have been created by the husbands through the agency of their, initially, prepubertal wives. As Jakamarra men are husbands to Napaljarri women, and Jangala men are husbands to Nungarrayi women the deposit would thus belong to both sections of the moiety. But just as the ambiguity of the mythology may prevent monopolization, it also opens the way for it to emerge. If demographic and social factors lead to the demise of one of the patrilines, the way is open for the other to assert control, strengthened today by the very practical consideration of residence on the spot.

It is not entirely clear what advantage accrues to those in control, except and perhaps crucially, an increase in those indebted to them, and a locally intensified rate of circuation of wealth with its concomitant of social centrality. Today, this counts for less as the people live on the geographic fringes of Warlpiri settlement, although access by car may compensate for this to some degree. It is possible that proselytization by the local fundamentalist missionary could inhibit the final assertion of rights involved in performing the ceremony for the site by 1 and 2 and leave the situation as it is. On the other hand, commoditisation may only be round the corner, although curiously it has not yet emerged, in which case the competition for control may intensify.

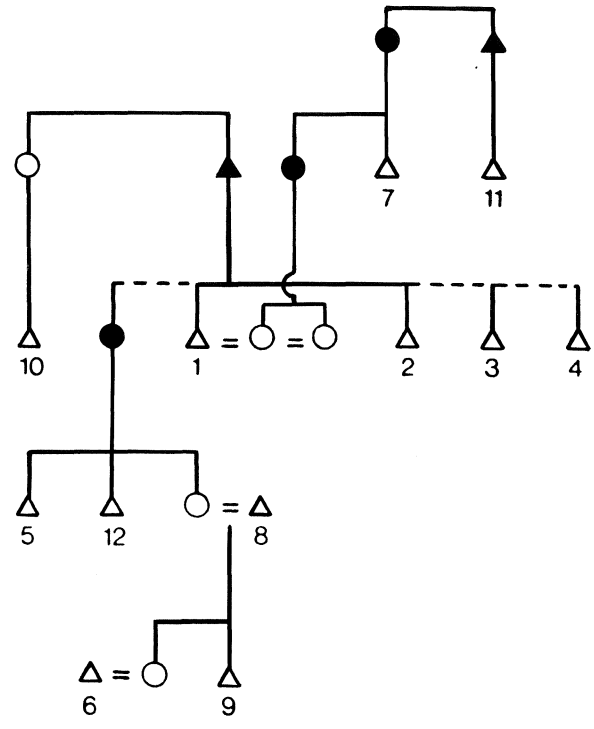


Table 3. Genealogical relationships between Aboriginal members of three parties to the mine. Party one: 1, 2, 3, 4, 5, 6, 7. Party two: 1, 8, 9, 10, 11. Party three: 1, 2, 10, 12. The subsection affiliations are: Jampijinpa: 1, 2, 3, 4; Jupurrula: 7, 8; Jakamarra: 9; Japaljarri: 6, 10; Jungarrayi: 11; Japanangka: 5, 12.

NOTES AND ACKNOWLEDGEMENTS. We would like to record our thanks to the Warlpiri men who took us to their mine and have allowed us to publish this information. It will be noted that we have not located the mine precisely. This is in order to ensure that control over access to it remains in the hands of those entitled to exercise it by Aboriginal tradition. We have had some misgivings about publishing information on this mine before now for fear it might precipitate unauthorised visits or a rush of unwanted visitors. Now the mine is Aboriginal land, formal permission to visit has to be sought, and illegal visitors are liable to prosecution.

We would also like to thank David Nash, Dick Kimber, Les Hiatt, Sandra Bowdler, Francoise Dussart and Eric Michaels for their helpful comments; Luise Hercus for the linguistic information and Rosemary Buchan of the Aboriginal Heritage Unit, Adelaide, for supplying published and unpublished material on the Bookatoo mine.

¡Although this mine is often referred to as the Parachilna mine, Parachilna is, in fact, the name of the Hundred in which it is located. Bookatoo is, apparently, the Aboriginal name for the deposit. There are various spellings of this name; that used in the body of the paper being the one under which the site is registered by the Heritage Unit. Whilst on the matter of spelling it should be mentioned that Wilga mia is also spelt Wilgie mia in some sources.

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