Early Man in North Queensland
Andrée Rosenfeld
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TERRA AUSTRALIS
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Department of Prehistory
Research School of Pacific Studies
The Australian National University
Terra Australis reports the results of archaeological and related research within the region south and east of Asia, though mainly Australia, New Guinea and Island Melanesia - lands that have remained *terra australis incognita* to generations of prehistorians.

Its subject is the settlement of the diverse environments in this isolated quarter of the globe by peoples who have maintained their discrete and traditional ways of life into the recent recorded or remembered past and at times into the observable present.
Early Man Shelter, 1972. Left to right, Dick Roughsey, Eddie Oribin, Percy Trezise.
EARLY MAN IN NORTH QUEENSLAND
art and archaeology in the Laura area

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Not until the discovery in 1896 of decorated galleries sealed behind the archaeological deposit at the site of La Mouthe in southwest France did the antiquity, indeed the authenticity, of Palaeolithic cave art in Europe begin to be accepted. The Early Man rockshelter near Laura, north Queensland, whose investigation is the subject of the present monograph, has something of the same importance for rock art studies in Australia, since excavation there in 1974 decisively demonstrated the high antiquity of rock engraving on the continent, previously argued on a number of indirect and not fully convincing lines of evidence. More than this, it became possible as a result of the investigations to begin to define an early engraving style with features widespread through the continent as well as a sequence of styles of more local significance.

The principal author, Andrée Rosenfeld, who both excavated the Early Man shelter and recorded its art, reports on the excavation and relates its findings to the general corpus of Australian archaeology as well as discussing the engraved art of the site and the region. She is a lecturer in the Department of Prehistory and Anthropology, Faculty of Arts, ANU, which has set itself as a principal aim the integration of the archaeological and ethnographic domains in teaching and research through a focus on the study of material culture and art.

Born in Belgium but brought up in The Netherlands and, after 1947, in England, Andrée Rosenfeld graduated in Physics at the University of Bristol in 1956. With this background in science and a developing interest in archaeology, she naturally gravitated to Professor Zeuner and the Department of Environmental Archaeology at the University of London's Institute of Archaeology, where she took her PhD in 1960. Her first book, *Inorganic raw materials of antiquity*, was written when she was Zeuner's Research Assistant at the Institute, though it was not published until 1965, by which time she was Research Assistant in the (then) Department of British and Medieval Antiquities at the British Museum. There a growing involvement with Palaeolithic rock art led to a book with P.J. Ucko in 1967, *Palaeolithic cave art*, which has been translated into seven languages.

David Horton, who reports on the faunal remains produced by the Early Man excavations, is Palaeoecologist with the Australian Institute of Aboriginal Studies in Canberra, a position he took up towards the end of 1974. Born in Perth in 1945, he took his first degree (Zoology and Physiology) at the University of Western Australia and his MSc and PhD, both in Zoology, as well as a BA (English and Prehistory), at the University of New England. He spent a year in England as a Postdoctoral Fellow at the University of York in 1973-4.

John Winter, whose discussion of the mammalian fauna of the Laura area provides a context for the interpretation of the prehistoric fauna dealt with by Horton, has since 1972 worked for the (now) Queensland National Parks and Wildlife Service in north Queensland as a Research Zoologist, based initially at Atherton and latterly at the Northern Regional Centre at Townsville. Born in East Africa in 1935, John Winter graduated BSc and MSc in Zoology, in New Zealand, at the University of Otago (1961, 1963) and PhD in Zoology, in Australia, at the University of Queensland (1976).

*Terra Australis* was established to provide for the publication of substantial research by staff and PhD scholars of the Department of Prehistory, Research School of Pacific Studies, ANU. Ian Hughes, the author of *Terra Australis* 3, was a graduate of the Department of Human Geography in the Research School, but his doctoral research there on traditional trade in the New Guinea Highlands was of obvious importance for prehistorians. This is the first time, however, that we have published a volume describing work done outside the Research School by authors who have never had direct connections with it. It is pleasing to have the opportunity to present work of such interest and importance.

Jack Golson
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1. Dr Rosenfeld

I should like to acknowledge my debt to Percy Trezise. It was through him that I was first introduced to the Laura area, its art and in particular the Early Man Shelter, even before reaching Australia in late 1972. Throughout my period of work in the area his help has been invaluable at all levels from the locating of sites to problems of logistics and camping. I am also grateful to him for permission to use his scale drawings and photographs of rock art deposited in the Australian Institute of Aboriginal Studies. Many field trips were guided by Mr J. Archer, whose assistance with the establishment and maintenance of a fairly inaccessible camp contributed significantly to the success of the excavation. I wish to thank Mr A. Archer in the same connection. Mr P. Marriot of Crocodile Station not only permitted excavation and rock art recording on the property but further assisted with the loan of horses to enable a small party to re-visit the site during the wet season of 1975, when the area was inaccessible to vehicles. The several colleagues and students who worked on the excavation have been more fully acknowledged elsewhere (Rosenfeld 1975), but I would like to express my particular thanks to Michel Lorblanchet who helped with the examination and recording of rock engravings in numerous localities, especially with photography.

The plan of the Early Man Shelter was made by Mr E. Orbin. The drawings for Chapter II (excavation report) were prepared by Mrs J. Goodrum and those for Chapter V (rock engravings) by Mrs V. Lyons. Finally I am indebted to Dr P.J. Ucko for valuable comments at various stages of drafting of the manuscripts.

All expenses of fieldwork and photography were covered by research grants from the Australian Institute of Aboriginal Studies. All artifacts from the excavation will be deposited in the Queensland Museum, Brisbane.

2. Dr Horton (Chapter III)

I wish to thank Mr W. Davies for allowing me to use his unpublished data on rock wallabies and for his suggestions regarding the rock wallaby remains from the site. I thank Dr G. van Tets for identifying the bird bone and Dr P.J. Ucko for his critical reading of the manuscript.

3. Dr Winter (Chapter IV)

I wish to thank all those people who supplied records, Mr J.G. Blackman and Dr H. March for critical comments, Mr P.W. Channels for preparing the map and Miss K. Stalian for typing.
In archaeological terms the 'Laura area' may be identified with the distribution of a distinctive style of rock paintings. Their greatest known density and many of the larger sites are centred on a short stretch of the Laura River, scattered along the creeks and the escarpments north and south of the river, east of the small township of Laura. Shelters with Laura-style rock paintings occur to the north of this almost as far as the sandstone plateau itself, particularly in the upper reaches of the Deighton River, and to the east as far as the Henderson Ranges, close to the Hopevale Aboriginal Reserve. Southward they extend into the margins of the Great Divide down to the North Palmer River. Rock paintings, and engravings, have been recorded as far west as the edge of the sandstone plateau known as 'The Desert', overlooking the Hann River. Although these paintings do not fall outside the range of Laura art motifs, none of the more distinctive aspects of Laura art has yet been reported so far west (Fig.1).

This body of rock art first became known to the scientific world and the general public after newspapers reported in 1960 that road-workers had found several galleries of Aboriginal paintings while working on the Cape York Developmental Road, a few kilometres east of Laura. P.J. Trezise, then an airline pilot flying in north Queensland, was among those whose immediate interest was aroused. After visiting the shelters he realised the implications of the road-workers' 'discovery'. In his book *Quinkan Country* (1969:23) he writes:

It was clear to me that these galleries could not be an isolated occurrence; their quality and quantity suggested a large body of similar art in the area. I decided then to carry out an extensive programme of exploration.

He did just that and his explorations and recording, which continue now, some 20 years later, are still adding new data to an impressive corpus of rock art sites. As a result of the work of Trezise and his colleagues, F. Woolston, D. Roughsey and E. Oribin, a vast and rich body of rock art is now known, recorded and archived in the Australian Institute of Aboriginal Studies (AIAS). The excavation at the Early Man Shelter and the survey of rock engravings presented in this volume form part of a broader and continuing research project on the art, archaeology and ethnography of the Laura area funded by AIAS, of which Trezise's exploration and rock art recording are a key component. The paintings at the Early Man Shelter will be treated in conjunction with the broader scope of rock art analysis of the region in a later publication.

Trezise's exploration for rock paintings soon led him to the discovery that there are also engravings in several rock shelters, usually with paintings, as well as on rock exposures in the Laura River bed. Apart from one paper devoted to an analysis of 'petroglyphs' in the area (Woolston and Trezise 1969) the engravings appear initially to have held a secondary interest for Trezise compared with the visually much more spectacular paintings. In his first paper on Laura art (Trezise 1967-8), he merely listed the engravings as the earliest artistic manifestations in his scheme for the chronological development of the art, and this treatment is not expanded in his subsequent monograph (Trezise 1971). Trezise saw the engravings as evidence for the great antiquity of rock art in the Laura area. It is for this reason that in 1972, on discovering a large shelter with an extensive and deeply weathered frieze of engravings, he named it the 'Early Man Shelter'. Furthermore, noting that at this site the engravings appeared to have been partly covered by artifact-bearing deposits, he realised its potential value for archaeological investigation and began to canvass the interest of prehistorians with an avowed interest in prehistoric art. It is partly as a result of the discoveries at these excavations (see Chapter II) that a re-evaluation of the diversity of rock engravings in the area became desirable, and this is presented in Chapter V.

Many painted shelters contain a surface scatter of stone artifacts, occasionally also charcoal and even traces of artifacts of organic matter such as wood, fibre and bark, implying a relatively recent utilisation of the shelters.
as campsites. In 1965 Trezise and Woolston carried out a small excavation in a painted shelter known as Platform Gallery in the eastern zone of the Laura area, in Isabella Creek (Normanby River) (Woolston 1965). The results have not been published. Being the work of people without formal archaeological experience, the excavations at Platform Gallery reveal little more than that painted shelters may contain archaeological deposits to some depth (12 ft = 3.5 m) with artifacts and stoneworking debris. In view of the fairly frequent assumption that Aboriginal rock art is necessarily sacred, and therefore that art sites were reserved for esoteric activities, even this limited result is of interest.

In 1964 R. Wright had excavated a larger painted rock shelter close to Laura township; he called it the Laura Shelter, but it is now locally known as the Mushroom Rock Shelter (Trezise 1971:34-6). Although this excavation is not fully published, a valuable analysis of the stone artifacts is available (Wright 1971), together with a summary of the stratigraphic situation which allowed Wright to conclude that the earliest human activity at this site must be of late Pleistocene age. He was not able to relate the paintings to other archaeological data, except to show that some painted shelters were also used for more general campsite activities. Environmental data such as food debris were totally lacking from the Mushroom Rock Shelter and the economic or ecological implications of the location of the site could not be pursued.

The subsequent excavations at the Early Man Shelter in 1974, although very poor in organic remains, have yielded the only faunal evidence available for north Queensland archaeology. Horton's analysis of this material (see Chapter III) is therefore aimed at extracting the maximum potential information from rather intractable and inadequate data. His analysis only applies to the earlier periods represented at the site, because the upper levels yielded no faunal materials. For the more recent past we must then rely on analogies with the contemporary ecological situation. Even this proves difficult to assess, as seen by the results of Winter's preliminary faunal survey in Chapter IV. It is difficult to evaluate the extent to which some 70 years or so of cattle grazing have affected the natural environment of the region. There appears to be very little intentional clearing of woodland for grazing, or indeed any management of the vegetation. Cattle tend to concentrate on the less arid lower ground and it seems unlikely that grazing has had significant direct effects on the higher slopes and plateau. The impact of a thriving population of feral pigs, however, may not be negligible. The relative paucity of wildlife recorded by Winter, which is amply confirmed by local lore, is surprising for a region of such recent European invasion and low intensity of exploitation. Whether the apparent depletion of the fauna results from the effects of European colonisation, or whether the area was already faunally impoverished by Aboriginal exploitation prior to this, as Trezise has suggested (pers. comm.), is a matter that will require much more ecological research, both of the historic past and of the 'recent' prehistoric past. It is certainly premature to attempt any detailed analysis of the economic potential of the region for hunter-gatherer populations.

Lying between latitudes 16° and 15°S, the area is subject to highly seasonal rainfall with marked wet and dry seasons. The country is covered by sclerophyll woodland, mainly of Eucalyptus spp., with dispersed stands of other vegetation, including Xanthorrhoea (an important source for resin) and fruiting trees such as Farinaria nonda. Along the rivers and creeks or in swampy hollows vegetation is usually more diverse with species of Melaleuca, Casuarina and Pandanus and occasional rainforest species also (D. Harris 1975). A detailed survey of the plant ecology and traditional plant uses in the area near Laura was initiated by J. Harris but unfortunately could not be completed. However, it established that knowledge of past plant exploitation is still current among many older Aboriginal people now living in Laura, although it appears to be but little applied or handed down to the younger generation.

The question of the extent to which aspects of traditional life are known, practised and valued among the Aboriginal people of the Laura area has important implications well beyond the bounds of archaeology, for current politics and for the future survival of the Aboriginal people themselves as a viable cultural group. It is, therefore, a debated issue which has often been more prejudged than discussed with Aborigines. Early during his exploration for rock art Trezise became fascinated with the meaning of the paintings. In order to get
information about the paintings and mythology, he began, together with D. Roughsey, a Lardil man from Mornington Island, to make enquiries among the older Aboriginal men. He worked with several old men, whom he believed to be among the last to retain traditional Aboriginal knowledge. He collected a number of Aboriginal stories, place names and the like, which are vividly rendered in his two books, *Quinkan Country* (1969) and *Last Days of a Wilderness* (1973). Under the auspices of AIAS, professionally trained anthropologists and linguists are currently carrying out more intensive research with Aboriginal communities. Their work reveals that the indigenous cultural life, although seriously disrupted, particularly during the violent, earlier part of colonisation and settlement, is certainly not defunct. However, in view of the extensive movement of Aboriginal people from their traditional homelands to prescribed settlements or penal colonies, a reconstruction of past territorial patterns and linguistic group affiliations is exceedingly complex. There may be some doubt therefore whether any of the stories collected by Trezise relate directly to any of the rock art, though they remain a fascinating record of Aboriginal concepts and expression. Much more rigorous work by anthropologists and linguists in close association with Aborigines will be required to re-establish the traditional patterns. The 'recent ethnographic past', which might serve as a model for archaeological interpretation of art and artifact distribution in the numerous rock shelters of the Laura area, is still a matter for further and urgent research.
Fig. 1 Map of the Laura area
EXCAVATIONS AT THE EARLY MAN SHELTER

INTRODUCTION

The Early Man Shelter is one of the group of decorated shelters scattered along some 2 km of hillside along a small creek on the northern slopes of the Laura River, approximately 15 km east of Laura township (see Fig.1). Its modern rediscovery was made by P.J. Trezise in 1972 during his explorations for rock art in the region with D. Roughsey and E. Oribi. Trezise (1973:194ff) gives a vivid account of his finding of the site with its rich frieze of paintings, but he was particularly excited by a broad oblique frieze of intensely patinated rock peckings which reached down to ground level and seemed to disappear below the deposits. He had seen similar linear non-figurative peckings in other sites of the Laura area, notably in shelters on the upper Deighton River (Trezise 1973:94, 195). He had judged the Deighton River engravings to be ancient on the grounds of patina and hoped that the Early Man Shelter, where the rock peckings were seemingly covered by deposit, might offer a possibility of testing this hypothesis.

The Early Man Shelter also contained a surface scatter of artifacts and its position on a shoulder of the hillside, as well as its morphology, suggested the possibility of some depth of deposit. Surface scatters of artifacts are frequent in the decorated shelters of the Laura area, but since most shelters are on steep slopes at the foot of the escarpment or within gullies eroded out of the plateau edge, the shelter floors are generally rocky or have only a thin veneer of loose, sandy deposit. Shelters with the likelihood of a substantial thickness of sediment seem rare, although admittedly evaluations of depth of sediment based on location and morphology can be misleading.

Earlier excavations by Wright at the Mushroom Rock (formerly Laura) Shelter, which is on low-lying, gently sloping ground, had revealed a long archaeological sequence estimated to date back to late Pleistocene times (Wright 1971:137). Charcoal was preserved to a depth of only 2 m, yielding a radiocarbon age of 6780 ± 150 BP, but artifacts continued to a depth of approximately 4 m. The most recent phase of occupation at the Mushroom Rock Shelter was associated with rock paintings, but the antiquity of the paintings could not be established. No faunal remains were found and in view of the loose, sandy nature of the soil this caused little surprise.

Because of the association of painting, rock pecking and artifacts at the Early Man Shelter, as well as its location and morphology, it appeared a promising site in which to test the relative antiquity of the art styles and to explore their respective archaeological associations. Furthermore, although the evidence from the Mushroom Rock excavation suggested that Aboriginal occupation of the region spanned a considerable time, further assessment of the chronology was desirable to confirm Wright's estimate of its late Pleistocene antiquity.

The Early Man Shelter was excavated during August 1974. Work was also carried out on the tracing of selected paintings to complement the grid recording of the frieze carried out previously by Trezise and Oribin. A nearby open air campsite with grinding hollows and rock peckings was also recorded and a collection of the artifacts on this site was made for comparison with the excavated material from the shelter.

THE SHELTER

Description

The shelter is formed under the very large overhang of a massive block of sandstone which lies on a slight shoulder of the hillside, below the escarpment and its steep slope deposits. It faces almost due west. The upper surface of this block, which is a bedding plane surface, slopes down, back towards the hillside, so that the edge of the shelter overhang does not act as a drip line.
Nor does it delimit the extent of protection from rain, for at its outer limit the roof is so high that even under comparatively still conditions rain reaches much of the southern half of the shelter floor. The extent of vegetation and wet soil plotted on the plan (Fig. 2) during February 1975 probably delimits the extent of protection from rain for normal conditions during the wet season fairly accurately. In the dry season the shelter offers some protection from the sun throughout the day. Inside the shelter the roof slopes down towards the rear wall but remains out of reach at approximately 3 m at its lowest.

The original shelter floor was a shallow depression in which deposits accumulated. The bulk of the sandy filling, however, does not arise from the attrition of roof and walls, as has been shown to occur for sandstone shelters elsewhere (Hughes 1978); the height of the roof precludes any physical attrition during human occupation of the site. The bulk of the deposit has accumulated from hillwash entering the shelter depression from both outer edges. The shelter roof, however, does show evidence of substantial rock falls along a bedding plane.

The Excavation

An initial excavation trench, 4 m x 2 m, was laid out on a 1 m square grid extending outwards from the back wall, where both rock peckings and some faded paintings appeared to have been covered by deposit. This trench was subsequently extended along the shelter wall by a 1 m square to expose more rock peckings and systematically to collect charcoal at 5 cm intervals for dating purposes. The
trench was also extended outwards by 3 m to investigate the stratigraphic relationship between occupation deposits and a level of rock fall. A smaller test trench, 2 m square, was dug farther out from the shelter to investigate the outward extension of occupation deposits and their relationship to the rock fall (see Fig.2).

The proportion of the site excavated is approximately one-fifth of the total area defined by rock walls and overhang. For reasons outlined above, the overhang gives a fairly arbitrary delimitation of total sheltered area; however, it corresponds fairly closely to the area over which the surface scatter of artifacts was observed prior to excavation. Calculated as a proportion of the rain-sheltered zone, the excavated area is about two-fifths of the total sheltered area.

The Deposits

The deposits consist of unconsolidated sand in which eight numbered levels were distinguished on the basis of colour, and of compaction in the case of Levels 1 and 3.

The differences in colour appear to be solely due to differences in charcoal content. Essentially the deposits represent a single sedimentary unit: sub-angular quartz sand and ochreous concretions grading from clean pink sand through brownish-grey to dark grey and black. The sequence is interrupted by a zone of rock fall, including some very large blocks. Occasional lenticular concentrations of charcoal fragments in very dark sand occur throughout, but these increase in frequency in the upper horizons. Much charcoal is dispersed through the deposits as very fine black dust. Near the surface, lenses of a bright pink ash form a distinct horizon.

The significance of discrete stratigraphic boundaries indicated on the section drawings (Figs 3a,b,c) requires brief discussion. The surface deposit was dry, totally loose and dusty to a depth varying from about 5-15 cm but generally averaging about 10 cm. Below this the deposit showed slight compaction. In the loose surface sand modern material such as fresh vegetation debris and the occasional cigarette butt from a few previous visits were evenly distributed. It is clear, therefore, that with the movement of people and animals, the surface is continually scuffed and objects are rapidly shifted both vertically and horizontally. This must have been equally true at any time under Aboriginal occupation, so that it is not possible to identify individual occupation floors. They probably did not exist as distinct horizons even at the time of occupation. It was therefore meaningless to attempt to plot the location of artifacts in great detail. The horizontal distribution would reflect haphazard kicking and scuffing rather than be a clear record of discard locations. Horizontal locations have, therefore, been recorded to within grid squares only.

The same problem applies to vertical distribution of artifacts. In a recent paper Hughes and Lampert (1977) discuss just this phenomenon and quote an experiment in which the vertical movements of objects in sandstone shelter deposits were observed over a depth of some 30 cm. They conclude, however, that the overall trends of vertical artifact distribution through the deposits do reflect their chronological sequence. The same considerations apply to any sandstone shelter deposits, except that the intensity of vertical movement is likely to vary with even slight differences in sediment compaction and granulometry. In view of the present situation regarding surface disturbance at the Early Man Shelter, a 'stratigraphic integrity' of about 10 cm would seem a reasonable estimate for this site. This small estimate is further supported by the existence of still identifiable charcoal and ash lenses, whose margins clearly fall within a zone of some 5 cm. Similarly, the colour changes between the numbered levels were identifiable to within 5 cm in profile.

DESCRIPTION OF EXCAVATION LEVELS

Levels 1-3

Very dark grey sand with a high proportion of fine dust, which consists largely of charcoal.
Fig. 3a  Section along the north side of the main trench
Fig. 3b  Section along the south side of the main trench
The boundary between the loose surface Level 1 and the slightly compacted Level 3 is irregular and reflects nothing more than the extent to which very recent use of the shelter by animals and man has disturbed the upper zone of the compacted grey Level 3. Within the undisturbed part of Level 3 lenses of charcoal concentration were frequent and variable in extent and density.

Lenses of a bright pink ash with clean sand, Level 2, occurred approximately 10 cm below the surface, mostly undisturbed and within the somewhat compacted Level 3 material. The pink ash deposit merged laterally and vertically with the grey sand through mottled grey-pink deposits. This pink sandy ash with little charcoal presumably results from hot oxidising fires rather than the slow smouldering fires which produce charred wood. Its restriction to one horizon is curious. It might result from the almost exclusive burning of the hard ironwood (Erythrophloem sp.). This wood requires higher temperatures for ignition and combustion than other woods in the vicinity of the site. The stump of a dead ironwood tree (with stone-axe cut marks) still stands on the edge of the shelter, showing that in the fairly recent past a considerable amount of its timber could have been easily available for burning, either intentionally in camp fires or accidentally in a bush fire. The occurrence of a level of pink ash may therefore be fortuitous and reflect nothing more than the death of a nearby tree of hardwood.

Artifacts occurred throughout Levels 1 and 3 but were less frequent in the pink ash Level 2. They include some fragments of chipped glass, worked wood (probably ironwood) and stone artifacts, some with adhering resin.

Levels 4-5

These consist of a grey-brown sand, Level 5, with occasional bands of a paler grey sandy deposit, Level 4.

The base of the grey-brown sand merges imperceptibly into the underlying blackened sand of Level 6. The boundary between these levels is, therefore, somewhat arbitrary. Levels 4-5 differ from the preceding and subsequent levels merely in their lower concentrations of charcoal.

Level 6

Sand which is blackened by a very high concentration of charcoal, both in
finely disseminated form and occurring as fragments of charred wood.

This level becomes distinctly stony towards its base, though some sandstone fragments occur throughout. From about 2.5-3.0 m from the back of the shelter, accumulations of large blocks of sandstone occur which are clearly derived from a massive roof fall. Some 6-7 m out some very heavy blocks have caused compression and distortion of the underlying deposits, forming a small depression which was filled with sandstone blocks and black sand (Figs 3a,c). The sand underlying these blocks is distinctly grey-brown (see Level 7, below).

Levels 7-8

Sand merging from dark grey-brown through brown to clean pink sand resting on bedrock.

Some sandstone fragments are dispersed throughout these deposits, particularly near the rock wall. Towards its base the pink sand shows patches of redder colouration of clean, ochreous quartz sand. Below the level of the rock shelf (Figs 3a,b) 3-4 m out from the back wall, the clean sand becomes very compacted and hard. Artifacts occur throughout these levels, except in the very compacted clean sand, but they decrease markedly in frequency towards the base. Charcoal fragments also decrease significantly in quantity in the lower levels, but fragments of charred wood occur almost down to bedrock.

**RADIOCARBON DETERMINATIONS**

**General Considerations**

All radiocarbon determinations are on charcoal fragments.

Some rootlets, insect casts and snail shells occurred down to about 1.5 m, but in view of the generally dry conditions of the site and the absence of surface vegetation or pedological structures, movement of humic matter in solution is not likely to have occurred.

In some areas against the rock wall there had been disturbance of the uppermost levels as a result of animals scooping out hollows and of water seeping down from the wall from a fissure in the rock at roof level. These disturbances have resulted in some mixing of deposits against the shelter wall where they are much less compacted and their colour boundaries are not distinguishable.

The effect of water flow over the rock wall appears to be relatively recent, for it has not affected deposits below approximately 40-50 cm, i.e. within Level 6. A relatively recent date for the beginning of water seepage on the shelter wall is also suggested by the rock paintings. Traces of paint remain visible on the edges of the now blackened rock wall and it is reasonable to assume that originally paintings would not have been made on such a very blackened and regularly wetted wall; during the wet period of February 1975 this part of the wall was seen to be covered with a film of water after even small showers.

These observations on the likely age of water seepage through the deposits are pertinent to assessing the significance of samples for radiocarbon dating from the lower levels in square D6 against the shelter wall, collected to give *ante quem* ages for the rock peckings which they cover. In view of the absence of observable seepage effects below about 40 cm and the evidence for the likely recent date of this seepage, the charcoal samples are considered to be *in situ* and uncontaminated. Allowing for the slope of the deposits over sloping bedrock, the ages obtained from area D6 are in fact consistent with dates obtained from the same stratigraphic levels in area B5.

**Dates**

**Level 2** From the large pink ash lens in A5, 50-52 cm below datum

ANU-1561: 820 ± 70 BP

**Level 3** From a charcoal and ash lens in B4, 50-52 cm below datum

ANU-1562: 950 ± 70 BP
**Level 6**

From the beginning of the stony zone of 6 in B4, 85–90 cm below datum

ANU-1443: 2850 ± 80 BP

From the base of the black level in B4, 110–115 cm below datum

ANU-1563: 5380 ± 90 BP

Among large blocks of roof fall in R4, 100–105 cm below datum

ANU-1445: 3340 ± 80 BP

Among blocks of roof fall and under an upturned engraved rock slab in Q4, ca. 90 cm below datum

ANU-1444: 4060 ± 80 BP

**Level 8**

Level of the rock platform in B5

ANU-1442: 11,850 ± 210 BP

10 cm below ANU-1442, in clean compact sand

ANU-1565: 18,2000 ± 450 BP

Level of the rock platform in B4

ANU-1564: 470 ± 290 BP

This date is clearly anomalous, but no satisfactory explanation can be offered.

Against the rock wall in D6 and covering engravings, 130–135 cm below datum

ANU-1441: 13,200 ± 170 BP

Against the rock wall in D6 and covering engravings, 145–150 cm below datum

ANU-1566: 12,600 ± 2800 BP - very small sample

Against the rock wall in D6 and covering engravings at the base of the wall, 150–155 cm below datum

ANU-1567: 15,450 ± 1500 BP - very small sample

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**Fig. 4** Graph of radiocarbon ages against depth of deposits
A graph of radiocarbon ages against depth of deposit below datum illustrates the results listed above (Fig. 4). A curve drawn through the age determinations from the B areas shows that the overall rates of sedimentation have not varied significantly since first occupation of the shelter which is dated by sample ANU-1442, taken from artifact-bearing deposits at the level of the rock platform. The change in slope between this point and the stratigraphically lower ANU-1565 in clean, sterile, compacted sand indicates slower rates of sediment accumulation prior to this. The slope of the graph shows an average sedimentation rate for the site of the order of 10 cm of deposit per millennium.

DISCUSSION OF THE STRATIGRAPHY

The most striking feature of the profile is the zone of rock fall at the base of Level 6. Some roof disintegration in the form of small blocks of sandstone occurred throughout the earlier levels. Roof instability also continued for some time after the major collapse. The transition from stony to stoneless deposit is radiocarbon dated to about 3000 BP (ANU-1443: 2850 ± 80 BP, for charcoal from a lens in the top of the stony portion of the blackened sand of Level 6).

Climatic conditions with a higher humidity could account for a more intense rate of corrosion of the rock along lines of weakness and the resulting fragmentation of the rock along fissures. Thus the overall change in stone content between the lower and upper levels could reflect more humid conditions than at present, prior to about 3000 BP.

Such climatic conditions alone, however, cannot account for the sudden large rock fall at the base of Level 6. This period of rock fall is dated by three radiocarbon dates to before about 4000 BP and probably around 5000 BP. Samples ANU-1444: 4060 ± 80 BP, for charcoal among the blocks of rock fall in excavation square Q4, and ANU-1445: 3340 ± 80 BP, for charcoal in the interstices between closely spaced blocks in excavation square R4, must both post-date the major collapse. The very massive slabs of sandstone shown in section S4-R4 (Fig. 3a) and also in T7-T9 (Fig. 3c) are seen to lie on the grey-brown sand (Level 7) and to have caused some deformation of this deposit. The black sand is banked up against the rocks on both sides and in area T7 is seen to have filled spaces under the overhanging edges of one of the larger blocks. It therefore seems most probable that the major episodes of roof collapse and the beginning of intensive occupation of Level 6 are broadly contemporary. Sample ANU-1563: 5380 ± 90 BP dates the base of Level 6 in square B4.

Small-scale tectonic activity is difficult to demonstrate. The region is, however, considered to have been tectonically unstable during the Quaternary, and probably up to the present. De Keyser and Lucas (1968:128) refer to the linear arrangement of Quaternary basalt cones on the Atherton Tablelands as evidence for the continuation of some movement along ancient fault lines of the Hodgkinson Basin during geologically recent times. They also consider that the stepwise uplift of the Laura and Hodgkinson Basins continued during the Cainozoic 'and probably mainly during the Plio-Pleistocene' (p.134) and that this was accompanied by faulting. Thus minor tremors which could precipitate the collapse of rock already weakened by corrosion along bedding planes cannot be ruled out. Evidence of other recent (i.e. fresh and relatively unweathered) rock falls exists in at least two other localities in the Early Man area and in several other shelters in the Laura area generally. At the 'Collapsed Shelter' of the Early Man group, a fresh-looking roof fall partly obscures the decorated back wall of the shelter and includes blocks with peckings identical to those still found on the shelter wall. These rock peckings cannot yet be dated, but they appear considerably less patinated than the early buried rock peckings at the main Early Man Shelter.

The most likely explanation for the features of the Early Man profile, therefore, is that the major rock fall was tectonic in origin. However, the overall difference in stone content between the lower and upper sands could have some climatic implications, namely somewhat more humid conditions than exist at present prior to around 3000 BP. The absence of pollen in the deposits makes a vegetational investigation of past climates impossible. The faunal evidence (Chapter III) shows a small increase in the number of taxa during the period
represented by the upper zone of Level 7 and Level 6 which may indicate a richer biotope between about 6000 and 3000 BP. However, the small amount of faunal material recovered from the site precludes any firm ecological reconstructions.

Palaeoclimatic evidence obtained by Kershaw (1975) from vegetational sequences in lake deposits on the Atherton Tablelands, some 200 km to the south of Laura, shows small changes in precipitation and temperature over the past 11,000 years in that area. He concludes that between about 11,000 and 7000 BP both wetter and cooler conditions than at present prevailed, with a mean annual temperature some 3°C lower than at present. Between about 6000 and 3000 BP he has evidence for significantly wetter and somewhat warmer conditions. He estimates annual rainfall to have been twice as high as at present, with an annual mean temperature approximately 1°C higher. He also considers that the vegetational history of the Atherton Tablelands reflects climatic shifts of a more widespread nature which may ultimately be related to the changing locations of coastlines with changing sea levels. Parallel shifts in rainfall patterns and temperatures may therefore be postulated for the Laura area. Although the evidence from Early Man Shelter is inconclusive, the sedimentological and faunal data from the site are entirely compatible with such climatic changes.

It is interesting to note that the duration of Level 6 at Early Man, with its marked increase in human activity and a number of technological innovations, discussed below, falls clearly within Kershaw's period of highest precipitation and temperature, around 5000-3000 BP, and with indications of a richer ecological environment than either previously or at present.

Apart from the amount of rock fall, the sediment changes are largely a matter of charcoal concentration and these may be taken to reflect differential human activity at or in the vicinity of the site. However, superposed on these fluctuations is the overall decrease in charcoal with depth, which was also observed by Wright (1971) at the Mushroom Rock Shelter. The most probable explanation for the decay of supposedly inert carbon is that much of what is preserved as 'charcoal' in these sites is in fact not totally charred but retains certain amounts of organic matter.

FORMAL AND/OR RETOUCHED ARTIFACTS

Typology and Raw Materials

A first examination of the Early Man artifacts makes it immediately apparent that formal typology has very limited application. However, at least one 'type', the burren adze of McCarthy's (1967) terminology, can be isolated and shown to have a restricted stratigraphic distribution. A few other artifact categories also have a similar stratigraphic distribution, but they occur in relatively small numbers.

The raw materials used are varied and occur abundantly as pebbles and cobbles in creek and river beds throughout the region. They consist of material eroded out of the cretaceous sandstone conglomerates and are mostly quartzites, vein quartz, chert and rhyolite, with a range of other rocks occurring in small quantities (see de Keyser and Lucas (1968) for an account of the geology of the area).

The fracture properties of these materials vary enormously and range from a totally irregular shattering to fracture along cleavages or veins and conchoidal fracture. In general, cherts show good conchoidal fracture, but some banded cherts show a clear tendency to cleave. Vein quartz ranges from fracture with recognisable conchoidal features to irregular shattering but generally shows a combination of some conchoidal with cleavage fractures. Quartzites vary in grain size as well as fracture properties. It is probable that the varied fracturing qualities of the raw materials used are in part responsible for the very heterogeneous appearance of the industry. However, as will be shown, some trends towards the selection of materials with predictable fracture and other properties can be observed.

Artifacts which show either formal regularities and/or edge retouch or use marks comprise about 1.5% only of the total number of lithic artifacts recovered. Of these approximately 34% consist of a heterogeneous assemblage of flakes, cores, and other fragments with some trace of edge retouch but no formal regularities, so defying typological classification.
Burren Adzes (Fig. 5)

The only 'type' which occurs in sufficiently large numbers to justify identification as a formalised tool are the adze flakes. These are manufactured on a longitudinal flake, usually relatively thick and with a more or less trihedral section. One side with retouch is straight or concave, but never convex, and the edge angles range between 60-80°, with a few approaching 90°. The opposite edge shows much greater variability, being usually straight or slightly convex but sometimes irregular. This edge is either naturally blunt or has some discontinuous retouch. The edge angles also show greater variation, from 40° to obtuse angles.

One specimen in Level 3 retains a thick coating of black gum or resin showing clearly how it was hafted, with the retouched concave edge protruding. Several others also retain fairly extensive traces and patches of black matter usually on the upper and lower surfaces and the 'back' (i.e. the less regular edge), but some black specks can also be observed in fissures between retouch scars on the presumed working edge. Under x10 magnification specks or traces of black matter which is probably a gum or resin can be seen on about three-quarters of these tools.

All but one of the specimens isolated on the formal criteria outlined above are made of chert, the exception being of quartz. Many show traces of use wear on the retouched edge under x10 magnification; some two-thirds of the sample show short broad hinged and step flaking on the underside of the flake and sometimes some edge battering and abrasion of projections. With these additional criteria of use wear, a small additional number of pieces can be added to the category of burren adzes, which conform in all respects, including traces of adhesive and choice of raw material, but which show either no or very little retouch of the utilised edge. The total sample isolated in this way is 35 specimens (and two very fragmentary specimens which may also be pieces of burren adzes).

The degree of size and formal standardisation of this artifact 'type' is best expressed by the histograms for length, ranging from about 25-50 mm on 22 whole specimens (X = 36.5, s = 5.636), and the relationship between Length over Width (L/W) and Thickness over Width (Th/W) ratios, which shows a fair degree of correlation with a factor r = 0.56 (Figs 6a,b,c).

These artifacts were all found in Levels 1-6, with the exception of one from within the top 10 cm of the underlying sand in square U8. In view of the 10 cm stratigraphic integrity for the site, no significance can be attached to this single specimen in the lower levels. The stratigraphic distribution of burren adzes is shown in Table 1.

<table>
<thead>
<tr>
<th>Level:</th>
<th>1+2</th>
<th>3</th>
<th>5</th>
<th>6</th>
<th>Under 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number:</td>
<td>12</td>
<td>11</td>
<td>4</td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1 Early Man Shelter: stratigraphic distribution of burren adzes

No artifacts from the lower levels with the same type of use marks as on the burren adzes have been found. It is likely, therefore, that the adoption of the chert burren adze in the Early Man sequence represents not merely a stylistic change of artifact but also a technological innovation. Kamminga's identification of the broad, flat step-flaked scars on the underside of the flake in terms of hardwood-working artifacts (Kamminga pers. comm.) would imply that specialised chert tools for hardwood working were not used at the Early Man Shelter prior to around 5000 BP. Since hardwoods are difficult to work successfully with quartzites and similar rocks, the appearance of chert burren adzes in the sequence may well reflect a significant extension in the efficient use of available timber resources at that time. In view of the concave edges on several specimens, their use can be inferred to include the manufacture of rounded artifacts such as spear shafts, digging sticks and the like, which are basic to primary subsistence activities. Innovations in the manufacture of, and possibly in the selection of more suitable materials for, such primary production artifacts is likely to have had enormous adaptive advantage.
Fig. 6  Diagrams of adze blade dimensions: a, length histogram; b, thickness to width and length to width histograms; c, correlation scattergram of the thickness to width and length to width ratios.

Fig. 5 (opposite page)  Burren adzes: a, D6,6 quartz; b, S4,1; c, T8,6/7; d, Q9,1; e, R4,1; f, D5,3; g, C3,1; h, C4,5; i, A5,2; j, D4,1; k, Q4,3; l, D6,6; m, D4,6; n, C5,5.
Fabricators (Fig. 7) and Small Flake Scrapers (Fig. 8)

Two other artifact 'types' appear to be restricted to the upper levels, but they occur in too small numbers to do more than hint at a possibility that they are part of the same technological change as the burren adzes. They comprise three fabricators from Levels 2 and 3, two of chert and one of quartzite, and a series of 13 small flake scrapers with relatively thin scraping edges. Of these, three are in quartz and 10 in chert; the edges are either straight (3), convex (8) or concave (2). They show no formal or technical regularities apart from the nature of the retouched edge and it seems that any suitable flake or sliver (e.g. quartz cleavage fragments) could be transformed into such a scraper. The range in size is fairly restricted, with maximum linear dimension varying between 20 and 30 mm.
Other Artifact 'Types'

Other artifact 'types' appear evenly distributed throughout the deposits.

Thick scrapers (Fig. 9)

Nine thick, high-angled scrapers on chunky flakes or split pebbles, which range in size from about 30-80 mm maximum linear dimensions and show no formal regularity. One in quartzite from Level 6 is concave and notched.

![Fig. 9](image)

Heavy duty scrapers: a, D4,3; b, D5,6; c, D5,8.

Unifacial chopping tools (Fig.10)

Two regularly worked unifacial chopping tools, one on a flat chert pebble from Level 6, the other on a thick pebble flake of quartzite from Level 7 (10-15 cm). There are also two much more crudely worked split pebbles with some unifacial edge flaking, from Level 3 and the top 10 cm of Level 7.

Bifacial artifacts (Fig.11)

Two bifacially flaked quartz artifacts are the only instances of bifacial working. One from under the large sandstone block in area T8 (Level 6/8) is a fairly thick asymmetrical pointed oval. The other from Level 8 is much chunkier, in the shape of a truncated oval.
Fig. 10  Unifacial chopping tools: a, C4,6; b, D6,7.

Fig. 11  Bifacial quartz artifacts: a, D6,8; b, T7,6/7.
Horsehoof core (Fig. 12) and split pebble

A large quartzite horsehoof core (basal diameters 140 and 120 mm) and a split pebble with similar edge flaking along part of its basal perimeter were both found in the surface deposit.

Fig. 12 Horsehoof core: A3 surface collection

Cores

Single-platform prismatic cores occur in small numbers (7) throughout the deposits and there are a few (4) with multiple platforms. Eight cores show a tendency to alternate flaking, leading to rough disc or polyhedral shapes. Only one small quartz core fragment shows clear bipolar flaking.
FLAKES AND FLAKED PIECES

General

Amongst the remainder of the lithic material little regularity of technique is observable. The bulk of the material consists of shatter fragments. Flakes with visible conchoidal features do occur; as might be expected a large proportion of the chert flakes shows clear conchoidal features, but only a small proportion of the quartz fragments. Among the other rock types, the finer-grained quartzites show conchoidal features but much material, consisting of reworked conglomerate pebbles, is intensely fissured and natural cleavage fractures are common.

Parallel-sided Bladelets

Despite the particularly unspecialised flaking technique, one very distinctive type of unretouched flake occurs; indeed it stands out among the generally very irregular debris. This is a series of parallel-sided bladelets. Out of a total sample of 16, 14 are of quartz and two of chert. One quartz prismatic core shows short but clear parallel scars from which such bladelets could have been obtained. It would seem, therefore, that they are an intentional product and not the waste by-product of the manufacture of some as yet unidentified artifact. They occur in Levels 3–6 and in two instances were found to cluster together in small groups: seven bladelets and the core along the boundary of squares T8–U8, Level 6, five bladelets in square R4, Level 5. The bladelets range in width from 9–12 mm and on seven complete specimens they range in length from 18–28 mm. The nearly complete bladelets (i.e. with only the tip fractured) also fall clearly within this size range.

These bladelets probably form a part of the technological innovations which appeared from Level 6 up.

ANALYSIS OF FLAKES AND FLAKED PIECES

The description that has been given of selected stone artifacts leaves out the bulk of the artifactual material, viz. some 98%. Yet this too must in some way reflect aspects of cultural behaviour and the blanket term 'heterogeneous waste' is neither informative nor useful for comparative purposes.

In his discussion of the artifacts at the Laura (now Mushroom Rock) Shelter, Wright (1971) has shown by a weight frequency analysis of flaked and retouched pieces that changes in artifact size occur through time. Weight categories on a logarithmic scale plotted in terms of a three-fold stratigraphic division of the deposits displayed a very marked trend over time towards smaller artifacts. An examination of the Early Man artifacts suggested that a similar trend existed and analyses of the material were devised to examine this more closely. Furthermore, in view of the selection for chert and quartz which can be shown to exist for some artifact categories which themselves have, or appear to have, uneven stratigraphic distribution, the artifact analysis also incorporates a three-fold division of the raw materials used into chert, quartz and 'other' (largely quartzite and fine-grained igneous or metamorphic rocks).

Because the stratigraphic differentiation of deposits was more distinct in the Early Man Shelter than at Mushroom Rock, it is possible to use the levels as stratigraphic units to examine trends in the artifact assemblages.

Table 2 shows a very significant and continuous trend in the selection for chert, from approximately 7% by weight at the base of the deposits to nearly 40% in the surface levels. A similar though less marked trend is shown in the selection for quartz. Table 3 demonstrates how these trends in the selection for raw materials relate to changes in artifact size. An overall trend towards the manufacture of smaller artifacts is observable, as it was at Mushroom Rock. But within any one level, throughout the deposits, there is also a clear tendency for the smaller artifacts to be made of quartz or chert and the larger ones of quartzite or other rock.

Both tables indicate an apparently gradual, continuous and related change in size and in preferred raw materials, possibly with a peak for small artifacts
Table 2  Early Man Shelter: weight of stone artifacts per level in squares B4, B5, C4 and C5 by raw material.

<table>
<thead>
<tr>
<th>Level</th>
<th>Quartz</th>
<th>Chert</th>
<th>Other</th>
<th>Total weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>435.9</td>
<td>411.8</td>
<td>230.9</td>
<td>1078.6</td>
</tr>
<tr>
<td>3</td>
<td>318.8</td>
<td>206.0</td>
<td>232.5</td>
<td>757.3</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>700.2</td>
<td>425.6</td>
<td>510.4</td>
<td>1636.2</td>
</tr>
<tr>
<td>6</td>
<td>748.9</td>
<td>345.2</td>
<td>1238.2</td>
<td>2332.3</td>
</tr>
<tr>
<td>7</td>
<td>470.0</td>
<td>81.0</td>
<td>1652.8</td>
<td>2203.8</td>
</tr>
<tr>
<td>8</td>
<td>1307.6</td>
<td>330.5</td>
<td>2968.4</td>
<td>4806.5</td>
</tr>
</tbody>
</table>

Table 3  Early Man Shelter: numbers of stone artifacts per level in squares B4, B5, C4 and C5 by size and raw material per level

<table>
<thead>
<tr>
<th>Level</th>
<th>Size</th>
<th>Quartz</th>
<th>Chert</th>
<th>Other</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>S</td>
<td>63</td>
<td>40</td>
<td>3</td>
<td>106</td>
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<tr>
<td></td>
<td>M</td>
<td>20</td>
<td>(63)</td>
<td>6</td>
<td>49</td>
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<tr>
<td></td>
<td>L</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
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<tr>
<td>3</td>
<td>S</td>
<td>163</td>
<td>99</td>
<td>10</td>
<td>272</td>
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<td>75</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>—</td>
<td>2</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>S</td>
<td>330</td>
<td>189</td>
<td>58</td>
<td>577</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>64</td>
<td>(394)</td>
<td>26</td>
<td>163</td>
</tr>
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<td>6</td>
<td>S</td>
<td>107</td>
<td>59</td>
<td>75</td>
<td>241</td>
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<tr>
<td></td>
<td>M</td>
<td>21</td>
<td>(129)</td>
<td>48</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>1</td>
<td>—</td>
<td>9</td>
<td>2.3</td>
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<td>7</td>
<td>S</td>
<td>85</td>
<td>47</td>
<td>31</td>
<td>163</td>
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<td></td>
<td>M</td>
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<td>(127)</td>
<td>45</td>
<td>116</td>
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<td>L</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>4.0</td>
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</table>

Table 4  Early Man Shelter: ratio of stone artifact number to weight by level

<table>
<thead>
<tr>
<th>Level</th>
<th>1+2</th>
<th>3</th>
<th>4+5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>6.9</td>
<td>2.2</td>
<td>2.2</td>
<td>5.9</td>
<td>7.8</td>
<td>18.6</td>
</tr>
</tbody>
</table>

within Levels 3-5 (see Table 3). This can be emphasised by comparing total numbers in Table 3 with total weights in Table 2, as an approximate guide to average artifact size, as shown in Table 4. There is no evidence for an abrupt transition, as indicated by Wright (1971) for Mushroom Rock and as might have been expected on the basis of the technological innovations identified from Level 6 up.

In view of the varying and uneven thicknesses of the deposits over the 4 m squares represented in Tables 2 and 3, the units compared represent unequal and fairly large time spans which could obliterate evidence for sudden change. A further analysis is therefore presented in Table 5 which is based on material from two squares only, B4 and B5, in which the fairly uniform thickness of each deposit and the uniform sedimentation rates indicated by the radiocarbon dates
<table>
<thead>
<tr>
<th>Level</th>
<th>Depth (cm)</th>
<th>Size</th>
<th>% Quartz</th>
<th>% Chert</th>
<th>% Other</th>
<th>Total %</th>
<th>Number of artifacts</th>
</tr>
</thead>
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<td>86.4</td>
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<tr>
<td></td>
<td>L 0.9</td>
<td></td>
<td>0.9</td>
<td>1.8</td>
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<td>3.5</td>
<td>7.0</td>
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<td></td>
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<td>66.0</td>
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<td>L</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 5  Early Man Shelter: percentage of stone artifacts per level in squares B4 and B5 by raw material and mass
allow the division of material into approximately equal time periods. Units of 10 cm thickness of deposit are taken, since the stratigraphic integrity argued for the site above (pp. ) makes this the smallest meaningful division, while it forms a relatively convenient unit to adopt within the basic stratigraphic zoning. Ten centimetres of deposit in squares B4 and B5 represent roughly a millennium. For practical reasons, mass of artifacts is expressed as volume of minimum containing right-angled prism (Table 5). Volume of minimum containing right-angled prism was taken as an approximation to weight since it is considerably more time-consuming to weigh very light objects of a few milligrams than it is to take linear measurements.

The most obvious result to emerge from the equitemporal analysis is the marked and relatively sudden decrease in overall artifact density in the lower levels. The change-over occurs within the 60-70 cm zone, at the base of Level 6. The overall trends isolated from Tables 2 and 3 are also discernible, but in this analysis the enormous fluctuations in artifact composition between 10 cm zones obscure any short-period trends in size or raw material preferences, particularly in the potentially crucial zones of Levels 6-7, where low overall densities result in particularly high fluctuations. That these fluctuations reflect no more than the very uneven horizontal distribution of artifacts over the excavated area can be demonstrated by a sequence per level of horizontal distribution diagrams (Table 6). The only consistent trends observable in these diagrams are the tendency for artifacts to accumulate against bounding walls: the natural shelter wall and, in Level 6, the temporary wall formed by the blocks of roof fall.

<table>
<thead>
<tr>
<th>Key</th>
<th>Level 1</th>
<th>Level 3</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4</td>
<td>421</td>
<td>773*</td>
<td>773*</td>
</tr>
<tr>
<td>D5</td>
<td>630</td>
<td>232</td>
<td>730</td>
</tr>
<tr>
<td>C4</td>
<td>231</td>
<td>47</td>
<td>195</td>
</tr>
<tr>
<td>C5</td>
<td>250</td>
<td>93</td>
<td>503</td>
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<td>293</td>
<td>59</td>
<td>577</td>
</tr>
<tr>
<td>B5</td>
<td>250</td>
<td>538</td>
<td>203</td>
</tr>
<tr>
<td>A4</td>
<td>239</td>
<td>59</td>
<td>143</td>
</tr>
<tr>
<td>A5</td>
<td>215</td>
<td>59</td>
<td>143</td>
</tr>
</tbody>
</table>

Level 6 (upper) | Level 6 (lower)
--- | ---
462 | 172
541 | 561
367 | 116
231 | 511
320 | 257
663 | 78
984 | 832
547 | 841

Table 6 Early Man Shelter: horizontal distribution of stone artifacts by weight in gm.

In order to analyse the relative abruptness or otherwise of the change in artifact size and material preferences, it would be necessary to compare much greater areas in short, equitemporal units and this is not possible with the Early Man material since the deposit thicknesses are very uneven. However, the evidence presented in Table 5 suggests that these trends are relatively abrupt between approximately 60 and 80 cm, broadly corresponding to Level 6.

The peak for small artifact size in Levels 3-5 suggested by Tables 2 and 3 can be analysed further from Table 5. It is seen to lie particularly between 30 and 50 cm, prior to the greatly increased use of chert in Level 1 observable in Table 2 (although not reflected in the smaller sample analysed in Table 5). An explanation for the apparent reversal in the uppermost level of the trend towards smaller artifacts may lie in the very high tendency for quartz to shatter into numerous small cleavage fragments when flaked. The slight increase in artifact size in Level 1, therefore, would seem to reflect a greater dependence on the more efficiently flaked material, chert.
CONCLUSIONS ABOUT FLAKED ARTIFACTS

A date of between 4000 and 5000 BP can therefore be suggested for the appearance of certain formal and technological innovations and a preference for smaller artifacts at the Early Man Shelter. This differs from Wright's estimate of around 3000 BP for the same event at the Mushroom Rock Shelter. The earlier date suggested by the Early Man data is compatible with dates for the beginning of what is conventionally known as the 'Small Tool Tradition' in other regions of Australia (e.g. Mulvaney 1975:Chapter 8).

OTHER FINDS

Ground Stone and Grinding Stones

One axe head (or hatchet, see Dickson 1976 for the terminology of these implements) was found in area D4, Level 6, made from an oval pebble of yellow chert. The two sides of the axe head are flaked and a narrow cutting edge is sharpened by grinding (Fig. 13). The butt shows some battering marks. There are abundant traces of black specks, possibly resin or gum, over most surfaces.

A number of small rock fragments with grinding marks was recovered throughout the deposits, from Levels 1-8. The lowest was at 110-115 cm below datum in D6, estimated at around 10,000 BP from the radiocarbon graph (Fig. 4). The majority are small flakes or chips not exceeding 20 mm maximum length, but one fragment, unfortunately of uncertain stratigraphic provenance, consists of the broken and damaged ground edge of an axe blade, 70 mm wide at its cutting edge. It is highly probable that all fragments derive from axe blades. If this is so, it is confirmatory evidence for the late Pleistocene antiquity of edge grinding in tropical Australia (see White 1971).
The raw materials of these ground stone artifacts appear superficially similar; they are all very fine-grained, dark grey to blackish rock. Hand-specimen identifications made by Alan Watchman, who also commented on their possible range of provenance, indicate, however, that a number of different rock types are represented. These include a dark, greenish-black basic volcanic (probably an altered amphibolite), metasediments (probably greywacke and similar rocks) and a spotted hornfels with quartz-feldspar augen structures. In view of the varied nature of the raw materials indicated in hand specimens, more detailed identification with a view to source material studies would be premature at this stage. All these rock types could have been obtained within some 50-60 km of the site, in the Chillaoge formation and the Dargalong metamorphics southwest of Laura. It is, however, worth noting that with the exception of the chert pebble axe, the rocks selected for axe manufacture differ from the materials employed for flaked artifacts.

Very few grinding stones were found. Two fragments of the same flat sandstone grinder occurred in Levels 3 and 6 respectively, against the rock wall in D5 and D6 in somewhat disturbed areas (see p.11 above). It is roughly shaped to a small oval plaque, 100 x 78 mm and 18 mm thick, and shows slight reddish colouration on the patinated surfaces. However, in view of the tendency for the sandstone to patinate to a pinkish hue, colour alone is not conclusive to identify it as an ochre grinder. Its small size, however, makes other uses, such as food preparation, less probable.

One large sandstone slab with two grinding hollows (Fig.14) was found at the base of Level 6 on the edge of the dark occupation deposit in area U7. These grinding hollows do not show any reddish colouration. A fragment of a heavy quartzite pebble pounder with battered edge occurred nearby, at the same level in area T7. The proximity of these two artifacts suggests they were most probably used together, perhaps for pounding roots or nuts.

Fig. 14  Sandstone slab with grinding hollows: U7,6.
Bone Artifacts

Four pieces of worked bone were found, three in Level 6 and one in Level 7. Three are pieces of slender bone points, manufactured from the fibulae of animals, probably about the size of rock wallaby. The fourth is a small fragment of long bone. Animal teeth, and in particular incisors, recovered during excavation were examined for evidence of non-natural fracture and wear, for incisors are known to have been sharpened and mounted in wooden handles and used as scrapers, for instance for sharpening spear tips (Roth 1904:21, Pls XV, XVI). No wear suggestive of tool use has been identified.

The detailed descriptions of the four bone artifacts are:

Level 6/7, R4: Bone point, length 49 mm, oval section of shaft 5 x 4 mm, broken at its base. The surface shows numerous sub-parallel striation marks from grinding and also, on one side, part of a pair of narrow longitudinal facets indicative of a scraping or planing action. Sets of very fine incisor gnawing marks at the base are presumed to be post-depositional.

Level 6, D5: Tip of a fairly blunt rounded point, length 19 mm, section at break 6 x 4 mm. The surface shows some striation from grinding.

Level 6/7, A4: Tip of a very fine point, length 19 mm, section at break about 3 x 2.5 mm. The surface shows some striation from grinding.

Level 7 (10-15 cm), B5: Fragment of long bone, shaped like a flattened point, length 25 mm, width 8 mm, thickness approximately 3 mm. This fragment is broken at the base and damaged at the pointed end. Its surfaces show parallel longitudinal facets, even within the slight concavity of the inner bone surface, produced by a scraping or planing tool.

Two bone working techniques are thus represented by these artifacts, scraping or planing with a sharp-edged tool, which in the case of the concave face of the flat object must have had a curved or narrow working edge, and grinding. The bone point from area R4 shows how preliminary shaping of the point was carried out by scraping prior to smoothing of the surface by grinding.

Ochre

Small fragments of ochre with facets and grinding marks occurred throughout the deposits down to bedrock (Table 7). The horizontal distribution of the ochre is irregular and shows no tendency to concentrate near the rock wall. Omitted from the table is a large piece of dense nodular ochre weighing 131.3 gm from Level 1, which shows no faceting or grinding marks. Taking the relative thicknesses of the deposits into account, it is clear that the vertical distribution of ochre is similar to that of the stone artifacts. It shows a sudden increase in Level 6 and the upper part of 7 and a decrease in Level 3.

<table>
<thead>
<tr>
<th>Level</th>
<th>No. of fragments</th>
<th>Weight in gm</th>
</tr>
</thead>
<tbody>
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<td>5</td>
<td>8.1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>19.5</td>
</tr>
<tr>
<td>4 + 5</td>
<td>8</td>
<td>115.4</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>139.5</td>
</tr>
<tr>
<td>7 (Upper part)</td>
<td>13</td>
<td>102.5</td>
</tr>
<tr>
<td>7 (Lower part)</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>59.0</td>
</tr>
</tbody>
</table>

Table 7  Early Man Shelter: number and weight of ochre fragments by level

Both the textures and the colours of the ochres used are variable. Textures range from soft and earthy to hard and gritty and include some hard, relatively pure dense nodular ochre. A thorough examination of the colours for comparison with the rock paintings in the shelter would entail the fracturing and partial destruction of all fragments. However, a preliminary investigation by simply streaking the surfaces on white cartridge paper reveals that a similar range of colours occurs in all levels.
Wooden Artifacts

Three fragments of wood with cut marks were found in the surface deposits, one of them in the slightly consolidated Level 3. One only can be identified as being other than a chip. It is a more or less rectangular, smoothed fragment, lightly biconvex in section and broken at both ends. Its width is 32 mm, maximum thickness approximately 7 mm and remaining length 90 mm. One end tapers lightly and is pierced by a small hole cut from both sides. It also retains extensive traces of black adhesive. By analogy with known wooden artifacts from Cape York, this could have been the rectangular handle of a macropod-tooth graver.

Resin or Gum

Concretions and small traces of a black substance on artifacts have already been mentioned in connection with some stone artifacts, particularly the adze flakes, and with the wooden implement discussed above. In addition some stone flakes and other fragments without retouch also retain traces of black concretion. However, in no instance is this sufficiently extensive or dispersed in such a way as to suggest a particular manner of hafting.

Two small fragmented concretions of a brittle-looking red resin or gum were found in Levels 3 and 6, weighing 2.6 gm and 4.2 gm respectively. Roth (1904:11-13) lists several resins and gums used in North Queensland, but refers to only two sources specifically identified for the Laura area (including Butcher's Hill). These are the roots of ironwood (Erythrophloem labouweri) and one unidentified resin. Several of the other trees and plants he lists occur in the Laura region and some were most probably exploited for resins, notably the beefwood (Grevillea striata) and Xanthorrhoea spp. Eucalyptus of the bloodwood group, one of which Roth (1904:12) quotes as exploited for 'gum' in the Brisbane region, was also used locally, apparently for medicinal purposes, notably staunching wounds when applied ground and mixed to a paste (J. Archer pers. comm.).

Analyses carried out by Dr B. Bowden on the Early Man samples (Appendix) suggest that they are most probably Xanthorrhoea spp.

Shells

A few shells of the freshwater mussel occurred sporadically in the upper levels, 1-6, but never in clusters suggestive of even a small midden.

Glass

Two small pieces of chipped green bottle glass were recovered from the loose surface deposit, Level 1.

ENGRAVED SANDSTONE SLAB

A slab of sandstone with pounded designs was found decorated side down among the large rock slabs within Level 6, area R4 (Fig.23).

For a number of reasons it is considered unlikely that this represents a fragment of a former rock shelter wall or roof engraving. On the one hand the roof above area R4 is so high that it would have required a tall scaffold (or tree) for its execution, while no other traces of engraving were observed on any of the other excavated blocks which had fallen from the roof. More significantly, the undamaged surface of the engraved rock slab differs in its patina from the shelter walls and roof; it is much more smoothly worn and in this respect resembles the surface of other exposed rocks in the vicinity of the site. Finally, there are a number of exceedingly worn rock engravings made by the same technique on exposed rock slabs of the Rock Platform site, described below (p.33). The technique consists of pounding many closely spaced pits, with no attempt to straighten or sharpen the edges.

The date of 4060 ± 80 BP (ANU-1444) obtained for charcoal underneath the block probably closely dates the period of its discard, since sizeable fragments
of charcoal are unlikely to have survived on the surface for very long during habitation. It is impossible to assess whether this also dates the engravings. Tool marks are still relatively clear, when compared with exposed engravings of a similar technique in the vicinity of the site, so it is unlikely that the block had remained exposed for very long prior to being upturned. An age of 4000-5000 years is, therefore, suggested as a probable order of magnitude for this decorated slab.

THE PECKED FRIEZE

The broad oblique frieze of patinated peckings on the shelter wall was covered by deposits of Level 8 dated to around 13,000 BP at its base (see p.12). A tracing of most of the exposed frieze was made. Some areas, however, were so generally corroded as to make it impossible to distinguish artificial from natural rock irregularities with any degree of certainty and in places the peckings appear to have merged with a general area of weathering. Such areas had to be omitted from the recording. The scale drawings are, therefore, prepared in three sections: section A (Fig.22a) covers the rock wall above squares D4, D5 and part of D6 of the excavation grid; section B (Fig.22b), to the right of A, is separated from it by a 1 m wide strip of unrecorded rock wall; section C (Fig.22c) follows directly on from B, but the peckings are interrupted by a sharp vertical ridge in the rock surface. Contour maps of the surface of the rock wall above present ground level were prepared by N. Clouten from photogrammetric stereo-pairs (Clouten 1977) and these also indicate the location of the major art features on the rock wall (Fig.15).

The frieze consists of linear non-figurative designs, mainly of pits, tridents (see Fig.24) and rectilinear mazes. The peckings are intensely corroded, so that the original tool marks are no longer discernible and the edges of the grooves are not always distinct. Some rather complex-looking configurations of linear and solid design (for definitions see Maynard 1977:393) may well result from the superimposition of a number of simpler elements. The degree of wear and corrosion precludes any attempt at deciphering the occurrence or sequence of superimposed peckings. A detailed analysis of the design elements which constitute this frieze is given in Chapter V.
Fig. 15 Contour maps of the shelter wall, photogrammetric drawing, after N. Clouten.
THE ROCK PLATFORM SITE

Description

Some 20 m downslope from the Early Man Shelter, on a relatively flat, sandy section of the hillside, is a large horizontal rock outcrop adjacent to an almost permanent small creek. The rock contained a scatter of artifacts in the upper 5 cm only of soil which filled fissures and depressions in its surface.

The rock also contains a number of grinding grooves and hollows and a few engravings.

The rock and adjacent sandy areas are surrounded by a relatively large number of trees with edible fruit or roots (nonda, Parinari nonda, ladyapple, Syzygium (=Eugenia) suborbiculare, currajong, Brachychiton sp., wild kapok, Cochlospermum sp.) and there is also a relatively high proportion of yam-like vines (Dioscorea) in soil pockets on the rock. The concentration of fruiting trees and other edible plants close to clusters of decorated shelters is a common feature of the Laura area and undoubtedly results from discarding seeds or other plant refuse around the camp margins. Similar observations have been made for camp sites in Arnhem Land also. There it is clear that Aborigines are fully aware of the effect of such discard around their camp sites and appreciative of its results (Jones 1975: 24).

The Artifacts

The artifact collection must be considered as a partial surface collection. Only artifacts in protected crevices have been preserved. It must be presumed that any which might have been left on the rock or fallen off the edge have long since been dispersed. None was found either on the sandy area near the rock or downslope from it. Pits dug in the sand by the excavation team for refuse disposal revealed no traces of artifacts, charcoal or other archaeological data.

The artifacts consist of the same raw material categories as in the shelter and have the same heterogeneous appearance and poorly controlled flaking technology. The quantities are as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>chert</td>
<td>767 gm (including one large flaked piece 172 gm)</td>
</tr>
<tr>
<td>quartz</td>
<td>505 gm</td>
</tr>
<tr>
<td>other</td>
<td>555 gm (including a split pebble 278 gm)</td>
</tr>
</tbody>
</table>

These proportions most closely resemble those in the uppermost levels of the main shelter. The stratigraphic position of artifacts only in the surface of deeper fissures is consistent with a relatively 'recent' date for the collection.

Only two artifacts have retouch: a small chert flake with 'scraper' retouch on one side and a more or less round quartz flake with denticulate edge retouch along one-third of its periphery. One chert piece shows the edge battering on opposite edges characteristic of fabricators, but its shape is considerably more irregular than is usual for this artifact type. These three artifacts conform with artifact classes from the upper levels of the shelter.

Three fragments of sandstone grinding stones were found. Two may be pieces of the same object; they show evidence of flaking to a roughly round disc up to 36 mm thick with one side highly smoothed. The third fragment is part of a smaller, thinner grinder, up to 22 mm thick, also flaked to a round disc shape and ground on both faces.

The Grinding Grooves and Hollows

Most of these occur in three clusters, with a few additional isolated examples. Two clusters are centred on natural depressions in the rock surface.

In the majority of cases there is evidence that the area selected for grinding was first roughly pounded, either to roughen the surface or to create a slight depression or both. Grinding subsequently deepened the area, sometimes creating almost vertical walls to a long narrow groove but more generally leaving a gradual slope. Two pounded depressions show no clear evidence of grinding. The grooves vary from distinctly long, narrow, classic axe-grinding grooves to almost circular, much shallower hollows. In view of the fact that the rock was
a camp site and has yielded sandstone grinding stones, it is likely that the rounder, shallower hollows were not axe-grinding hollows but used for other purposes, such as pigment grinding or food preparation. One small chip of red ochre with a grinding facet was found, and one egg-shaped lump of soft yellow ochre.

The Engravings (Fig. 24)

The engravings are shallow, patinated, very worn and barely visible in daylight. They comprise pounded or pecked-out areas, without any further work to straighten or sharpen the edges, in every respect similar in technique to the engravings on the excavated block in the shelter (see pp.29-30). There is one case of superpositioning between the margin of an isolated axe-grinding groove and two engravings: the groove has cut into the edge of two human tracks (Fig. 24b).

Further indication of the relative ages of grinding hollows and engravings can be deduced from their respective locations on the surface of the outcrop. There are a few large slabs of sandstone on the solid rock outcrop, some of which are still partly attached to the main body of the rock but have begun to fissure off. These slabs are the remnants of an older, largely exfoliated surface of the outcrop. All but two grinding hollows lie on the lower, more recent rock surface, but the engravings are restricted to the surfaces of two of the exfoliating slabs.

Thus it seems probable from three independent factors that the engravings are more ancient than the grinding hollows and artifacts. The factors are: the one case of superpositioning; the consistently higher degree of physical weathering of the engravings; and the respective locations of the two types of rock markings, with the engravings restricted to remnants of an older surface of the outcrop. By analogy with the date of the decorated slab from the shelter excavation it may be tentatively suggested that the engravings could be of the order of some 4000-5000 years old, whereas as already stated the proportions of raw materials among the artifacts suggest a correlation with the uppermost levels of the excavation.

THE CHRONOLOGY AND CONTEXT OF ROCK ART AT THE EARLY MAN SHELTER

As a result of the excavation it is now possible to distinguish three separate techniques of rock art which have somewhat differing archaeological contexts and to examine their relative and absolute chronologies. The techniques are painting, pounding of closely spaced marks and relatively deeper pecked lines.

Pecking

The designs of the pecked linear engravings exemplified in the frieze on the shelter wall clearly differ in style from those of the other two techniques. They are non-representational in so far as no figurative items can be unambiguously identified. The superficial resemblance of the tridents, and especially the tridents with spur, of this style to bird tracks (e.g. emu or scrub turkey) of the other engraving style cannot be substantiated and some of the variants of the trident design are not compatible with such a representational interpretation (see pp.52-54 for a fuller discussion).

This technique of pecked linear designs is also more ancient than the other two at the Early Man site; one set of shallowly pecked macropod tracks and one painting are superimposed on it (see Fig.22c, top left and above one of the natural hollows). It begins around or before 13,000 years ago (see p.30). Since the pecked frieze stretches from bedrock to above present ground level, it cannot be established whether the entire frieze or merely its lower levels antedate the accumulation of artifact-bearing deposits.

However, even at or close to the period of its execution the existence of the engravings did not preclude the use of the site for sporadic occupation. It is difficult to establish the nature of the use of the site in the earlier levels: game was brought and consumed there and a range of unspecialised stone artifacts was manufactured. Chips from edge-ground artifacts attest to woodworking activities also, but the absence of complete axe heads indicates that these (and perhaps also
other) artifacts were subject to repair and maintenance and were not readily abandoned at the site. Facetted lumps of ocher confirm the evidence from Mushroom Rock for the great antiquity of paints, but at neither site is there any indication of what was painted.

The deeply corroded and patinated nature of the linear style peckings contrasts with the few shallow peckings on the rock wall and suggests that the entire linear frieze has 'some antiquity'. On the available evidence it may be tentatively postulated that this art form is associated with part, or all, of the earlier phase of occupation at Early Man, represented by Level 8, and that it antedates the introduction of the more specialised stoneworking technologies and different art styles in Level 6, around 5000 years ago.

Shallow Pecking or Pounding

The shallow engraving on the block excavated in the shelter was probably made on a surface outcrop of rock. Engravings in a similar technique are known from a few other shelters in the Laura area, where they are commonly at or close to ground level. Shallow peckings are also known from open sites, such as the Rock Platform (see p.33) and on rock exposures in the bed of the Laura River at the crossing west of Laura (Woolstone and Trezise 1969 and Chapter V below).

Evidence from the Early Man Shelter indicates that this art style has an antiquity of probably around 4000-5000 years (p.29). The Early Man Shelter wall also has a few shallow engravings with no visible patina, some of which have been cut into paintings. It seems clear, therefore, that some rock engravings are contemporary with the tradition of rock painting, whereas between the early engraved frieze and the painted frieze there is virtually no overlap.

The archaeological context of shallow engravings cannot at present be defined because of the absence of appropriate archaeological evidence from the sites where they occur.

The Paintings

No trace of paint was preserved on the rock wall below the level of the deposits. However, two very faded paintings depicting the upper parts of flying foxes, i.e. part of the body and legs, are faintly visible at ground level (see Fig.22a) together with a few indecipherable traces of paint. By analogy with the style of flying-fox paintings in other shelters of the Laura area, these partial flying-fox paintings would, if originally complete, have extended some 10-12 cm down below present ground level. They must, therefore, have been executed when ground level was at least about 15 cm lower than at present, which by extrapolation from the radiocarbon curve for the site (see Fig.4) corresponds to a period of at least 1000 BP.

It is more difficult to assess the probable origins of the painting tradition, but two factors indicate that it is unlikely to be older than some 4000-5000 years at the Early Man Main Shelter: there is a sudden and significant increase in the use of ocher from Level 6 on and the level of the painted frieze on the rock wall is such that if it had been executed from an earlier ground level, some form of scaffolding or other aid would have been necessary in order to accomplish it. Rock painting can be shown to have been an active part of Aboriginal tradition at the time of European contact from the depiction of items such as horses and riders at some sites in the area.

The range of stone and other artifacts and stoneworking debris, as well as hearths, food refuse and food-grinding equipment, suggest that general camp activities were associated with rock paintings at this shelter. This is also true of the Mushroom Rock Shelter.

Shallow Pounding and Painting

In view of the overlap in their respective locations and chronology at Early Man, it may be tentatively postulated that rock painting and pounded designs are two contemporary aspects of the artistic tradition of the Laura area which emerged in or was introduced into the area, together with a number of technological innovations, after about 5000 years BP.
III FAUNAL REMAINS FROM THE EARLY MAN SHELTER

D.R. Horton

In her excavations of coastal plain and inland plateau sites in northwest Arnhem Land, C. White (1971) found faunal remains in midden deposits on the plain indicating an economy similar to that recorded for the area ethnographically: 'freshwater and estuarine shellfish, fish, and tortoises as well as macropods and small marsupials like bandicoots and possums. They also ate birds such as palmated geese...' (p.154). White suggested that these sites were used in the dry season and that people moved to the plateau when the plains became flooded during the wet season. Unfortunately no faunal remains were found in the plateau rock shelters, probably because of acidic conditions. Acidic conditions also probably caused the absence of fauna in the Laura rock shelter, now known as Mushroom Rock, excavated by Wright (1971).

The Early Man Shelter at Laura, with approximately 2600 fragments of bone weighing almost 1.5 kg, is important for two reasons: it provides not only the first archaeological faunal remains from Cape York (except for the Weipa shell mounds which have not yet been analysed) but also the first faunal evidence from an inland (i.e. non-marine, non-estuarine) tropical Australian site.

In order to obtain enough specimens to carry out an analysis, I have treated all the bones from the site as a single sample in the sections which follow. Chronological changes are discussed in the final section, but these should, in general, be treated as tentative suggestions because of the low numbers of specimens involved when levels are considered as separate units.

FAUNAL DIVERSITY

The diversity of fauna is extremely low (Fig.16). Almost half the remains are of a single species, Petrogale godmani, a rock wallaby. Two other macropod and two possum species make up another third of the remains. The numbers of each species were calculated mainly from mandibles for the marsupials, vertebrae for the reptiles and humerus for the bird. To obtain more realistic minimum numbers it would be necessary to add on two or three individuals for each macropod species to account for the single teeth and to assume that each reptile vertebra probably represents one individual. Making these adjustments has little effect on the proportions of species present. To check these proportions, parts of the post-cranial skeleton were also analysed (Table 8) and these figures confirm those obtained from mandibles.

The single teeth require some discussion. Their numbers seem high, but they could have come from just two or three individuals of each species. The numbers are approximately equal for the three macropod species, but this simply indicates that the Petrogale jaws have broken up less than those of the other two species. It is clear that there are not sufficient isolated wallaby and kangaroo teeth to compensate for the difference in numbers of jaws.

The modern mammal fauna of the Laura area is discussed by Winter in Chapter IV. His modern faunal list agrees very well with that determined from the excavated remains. The most conspicuous absences among the mammals found at the site are rats and fruit bats.

FAUNAL IDENTIFICATION

Petrogale godmani (Plate 1a)

The two species which could be confused with rock wallabies in Cape York are Lagorchestes conspicillatus and Thylogale stigmatica: all three have teeth
Fig. 16 Faunal diversity: Numbers of individuals for each species (the dotted line is a more realistic estimate).

Table 8 Early Man fauna: skeletal parts by species

<table>
<thead>
<tr>
<th></th>
<th>Petrogale</th>
<th>Wallaby</th>
<th>Kangaroo</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxilla</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Lower incisor</td>
<td>10</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Upper Molar</td>
<td>12</td>
<td>6</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Lower Molar</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Mandible</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Scapula</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Humerus</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ulna</td>
<td>7</td>
<td>0</td>
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<td>Radius</td>
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<td>0</td>
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</tr>
<tr>
<td>Pelvis</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Femur (2+)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tibia</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Astragalus</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Calcaneum</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cuboid</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>Metatarsal IV</td>
<td>9</td>
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<tr>
<td>Metatarsal V</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Note: Vertebrae, phalanges and fibulae not counted because of fragmentation and difficulties of estimating size. Numbers of *Petrogale* femurs uncertain because of fragmentation.
(including premolars) of about the same size and with similar morphology. The simplest distinction between them is that Lagorchestes has a deeper mandible than the other two and that Petrogale teeth wear more rapidly than Thylogale teeth. There are, in addition, some minor differences between the three. The rock wallaby presently occurring in Cape York is Petrogale godmani (G. Maynes pers. comm.) and the Laura specimens agree in size and morphology with that species.

Macropus robustus (Plate 1b)

Three species of kangaroos occur in Cape York: the wallaroo (Macropus robustus), the antilopine kangaroo (M. antilopinus) and the grey kangaroo (M. giganteus). I cannot distinguished between these species on the basis of the jaw and molar material from Laura. A premaxilla with three upper incisors is not M. giganteus but could be either of the other two species. Tate (1952) records M. robustus near Laura and the rocky country where Petrogale was caught may be more likely to have M. robustus than M. antilopinus.

Macropus agilis/M. parryi (Plate 1c)

I am unable to distinguish between these two species on the basis of molar teeth. M. agilis may be more likely for distributional reasons, since it occurs throughout Cape York, whereas M. parryi occurs mainly around the Cairns area. However Tate (1952) records that M. parryi was formerly common near Laura.

Bettongia tropica (Plate 1d)

This species can be distinguished from the other bettongs on the basis of premolar morphology. In B. penicillata the premolar is flexed outwards from the line of molars, in contrast to the other three species. In B. lesueur the upper and lower edges of the enamel are parallel, in B. gaimardi the lower enamel edge is slightly, and in B. tropica strongly, curved downwards (following the line of the upper edge of the jaw). B. tropica has a larger premolar than B. gaimardi. This species has only recently been described (Wakefield 1967) and only six specimens have previously been collected. The Laura specimen is the most northerly record of the species.

Sarcophilus sp.

The identification of this specimen has been discussed elsewhere (Horton 1977).

Petaurus breviceps (Plate 1e)

Two species of Petaurus occur in Cape York. The Laura jaws agree in size with the smaller of these, P. breviceps.

Peramelidae (Plate 1f)

The jaw fragment is too broken to permit more than identification to family.

Trichosurus (Plate 1g)

These maxillae appear to be identical with T. vulpecula.

Turnix (Plate 1h)

The bird humerus was identified as Turnix cf. varia by G.F. van Tets. A coracoid of Turnix from the same level is probably also this species.

Reptiles

Dentary

The posterior end of a right dentary is from an Egernia species (Plate 1l). It appears similar in form to E. hosmeri and E. frerei, the two largest Egernia in Cape York, but is considerably larger than my reference specimens of these species. It is equal in size to E. major which at present occurs only in south-east Queensland and northern New South Wales.
Vertebrae

The reptile vertebrae from Laura are of two distinct types, one with zygodomes present (snakes) and one without (lizards). The snake vertebrae are of two kinds. One relatively small one has a distinct hypapophysis and is probably an elapid (Plate 1j) (Smith 1976). The others lack hypapophyses and may be from boids (Plate 1k), but the area of the parapophyseal processes is broken on each specimen, so the identification is uncertain. One of the four possibly boid vertebrae consists of two vertebrae fused together.

One of the three lizard vertebrae has the characteristic overhanging condyle and smooth ventral surface of Varanidae (Plate 1k) (Smith 1976). The other two are broken in this area but are probably also varanid.

Maxilla

This specimen has the combination of posterior acrodont and anterior pleurodont teeth characteristic of Agamidae (Plate 1m). However, the pleurodont teeth are directed outwards from the jaw and I hesitate positively to identify this specimen as agamid without a matching reference specimen.

Others

One toothless macropod jaw fragment is similar to Petrogale but somewhat smaller. It may simply be a very small individual of Petrogale, but Onychogalea is also a possibility.

A rib-like bone, a small bony plate (osteoderms?), a small long bone (humerus?) and a small bone (reptile quadrate?) cannot be identified.

One large bone may be the humerus of a relatively large bird.

FAUNAL REMAINS AS FOOD

The meat weight represented by the remains is difficult to calculate, because of uncertainty about both numbers of individuals and size of each individual. To make the figures reasonably comparable between species, I have used the lowest minimum numbers (i.e. leaving out single teeth and extra reptile vertebrae).

Adult Petrogale godmani weigh approximately 4 kg (female) or 5 kg (male); I have used a figure of 3 kg of meat from each individual, allowing for the weight of skin and bone.

Adult Macropus robustus weigh approximately 20 kg (female) or 40 kg (male); juveniles of the same age as the Laura specimen weigh about 20 kg (female) or 25 kg (male) (Ealey 1967). I have arbitrarily taken 30 kg and 20 kg respectively as the weights for the Laura specimens, which together would provide about 30 kg of meat.

Adult M. agilis weigh up to 15 kg, juveniles about 10 kg. Together the two Laura specimens represent about 15 kg of meat.

Most of the smaller species weigh 1 kg or less. The exceptions are Trichosurus, which can weigh up to 4 kg, and Sarcoophilus, which can weigh up to 10 kg in Tasmania (Green 1967). Altogether the small animals could weigh between 15-20 kg and contribute 10-15 kg of meat, depending on the weight of Sarcoophilus, the Laura specimen being smaller than specimens from Tasmania.

The relative meat weights are:

- kangaroo and large wallaby 45 kg (49%)
- rock wallaby 33 kg (36%)
- others 10-15 kg (15%)

Although there are more rock wallabies than any other species, they provide only about one-third of the meat, while two kangaroos and two wallabies together provide half the meat.

Assuming that the excavated area is about one-fifth of the site, the amount of meat present would provide about 1,320,000 kcal (Meehan 1975:fig.9.7), enough for one man for about two years.
Plate 1

a, *Petrogale godmani*: left mandible, labial view. Square Q4, Level 7
b, *Macropus robustus (?)*: right premaxilla, labial view. Square B5, Level 8
c, *Macropus agilis (?)*: left maxilla, occlusal view. Square T7, Level 7
d, *Betongia tropica*: left mandible, labial view. Square B5, Level 8
e, *Petaurus breviceps*: left mandible, labial view. Square T7, Level 7
f, *Peramelidae*: left mandible, labial view. Square B5, Level 8
g, *Trichosurus vulpecula*: right maxilla, occlusal view. Square A4, Level 6
h, *Turnix vari (*?): coracoid. Square B5, Level 6
i, *Egeneria sp.*: right dentary, dorsal view. Square R4, Level 6
j, *Elapidae*: vertebra, posterior view. Square B5, Level 7
k, *Boidae*: vertebra, posterior view. Square A5, Level 2
l, *Varanidae*: vertebra, posterior view. Square Q4, Level 7
m, *Agamidae*: right maxilla, lingual view. Square T7, Level 7
AGE STRUCTURE OF PETROGALE AND ITS IMPLICATIONS

The rock wallaby age structure is as shown in Figure 17. Most are relatively old animals: about 70% have the fourth molar either partially or fully erupted; 50% have fully erupted teeth. There is no apparent change in this pattern through time.

Davies (pers. comm.) has found that approximately 60% of rock wallabies examined in one trapping period had the fourth molar partially or fully erupted. It is not possible to make a clear-cut comparison between these data and those from Laura, because of differences in the nature of the data. However, Davies has suggested a number of possible reasons for the low number of young rock wallabies found in the Laura excavation:

1. Hunting would presumably be done in the most accessible areas of a rock outcrop. These predator-prone areas are the least suitable ones for rock wallabies, and the animals living there may be the older individuals, rather than the main part of the breeding population.

2. Davies says: 'When alarmed, a family of mother, mate and at-heel offspring does not use a single escape strategy. The young is likely to remain hidden in a small fissure of rock, too small for predators to follow, while the adults run off. I would expect that, as with larger kangaroos, the older males would be slower than young males or females (who would eject pouch young beyond a certain weight). A party of hunters who drove animals towards a group with waiting spears would get few or none at-heel young and possibly more older males'.

3. Low rainfall over a number of years could result in the failure of breeding and a lack of young animals in the population.

The third of these reasons is the least likely because of the length of time represented by the deposits in the site, but a similar factor may be relevant. Davies finds that although rock wallabies are year-round breeders, fewer young survive during the summer. The lack of young rock wallabies in the remains from Laura may be an indication that the site was mainly used during the wet season.
POST-CRANIAL BONES

Table 8 gives the relative numbers of parts of the skeleton for each species. Figure 18 presents this information diagramatically for the rock wallaby remains. The results are not easy to interpret. There seems to be no evidence for selective use of particular parts of the body; the commonest elements are mandible and humerus, then maxilla, ulna, pelvis, tibia and metatarsal IV. Poorly represented elements occur anatomically between, or adjacent to, common elements. In general terms the pattern seems to be that small bones (i.e. cuboid, calcaneum, astragalus) and fragile bones (e.g. scapula, radius) are in low numbers. However, such strong bones as metatarsal V are low in numbers and relatively weak bones such as ulna are common.

All parts of the body of kangaroo and large wallaby are equally well represented, so there is no evidence for selection of parts in these species either.

There are generally between 25% and 50% of the number of Petrogale post-cranial bones expected on the basis of minimum numbers (calculated from mandibles). For kangaroo and wallaby this figure is usually 12.5% or less, suggesting that while numbers of bones of all species have been lost from the site, the process has affected Petrogale bones less than those of the larger species. Probably larger bones would be cleared away from the living area, the small bones being incorporated into the deposit unnoticed. The only kangaroo bones which are relatively highly represented compared to those of Petrogale are the small foot bones (astragalus, calcaneum, cuboid). It is likely that these bones, being small, would be left behind when larger bones were cleared out, but I am not certain why the numbers of these bones should be so low for Petrogale.

![Fig. 18 Petrogale: numbers of different skeletal parts]

CHRONOLOGICAL CHANGES

The main change through time (Fig.19) is the virtual absence of bone in the upper layers (1, 3 and 5) compared to the amount in the lower levels. The peak in bone weight per unit volume occurs at either Level 7 or Level 7/8, with Levels 6 and 8 having approximately equal concentrations of bone. In the lower levels about 20% (by weight) of the bone is burnt, above Level 6 all bone is burnt. The proportion of weathered (or corroded) bones decreases from 23% in Level 8 to 7% in Level 6 (although Level 7/8 is actually the highest at 35%).
The proportion of bones chewed by rats increases from 0% at Level 8 to 9% at Level 6. In both cases the number of bones above Level 6 is too small to calculate meaningful percentages.

Faunal diversity (Tables 9a,b) increases from Level 8 to Level 6; the number of taxa in Levels 6 and 7 is equal, but there is a greater volume of deposit in Level 7.

The peak in numbers of *Petrogale* is at Level 7 but would be approximately the same as the number in Level 6 for equal volumes. Weight of meat per volume of deposit is highest for Level 7, progressively lower in Levels 6 and 8. There are too few bones present at each level to determine whether the proportions of the post-cranial bones change through time. Humerus, ulna, pelvis and perhaps tibia have relatively higher numbers in Levels 6 and 7 than in 7/8 and 8, while the converse may be true of metatarsal IV.

![Diagram](image.png)

**Fig. 19** Weight of bone / volume of level: B, squares B4 and B5; C, squares C4 and C5; D, square D4

---

**Level** | *Petrogale* | *M. robustus* | *M. agilis* | *Petaurus* | *Trichosurus* | *Peramelidae* | *Bettongia* | *Sarcophilus* | *Turnix*
---|---|---|---|---|---|---|---|---|---
1 & 2 | | | | | | | | | 2
3 | | | | | | | | | 1
4 & 5 | | | | | | | | | 1
6 | 5 | 1 | 3 | 2 | | | | | 2
7 | 8 | 1 | 1 | 1 | | | | | 1
7/8 | 2 | | | | | | | | 1
8 | 4 | 1 | | | | | | | 1

**Level** | *Boidae* | *Elapidae* | *Varanidae* | *Scincidae* | *Agamidae*
---|---|---|---|---|---
1 & 2 | | | | | 1
3 | | | | | 1
4 & 5 | | | | | 1
6 | 1 | 2 | 1 | | 1
7 | 1 | 1 | 1 | | 1
7/8 | | | | | 1
8 | | | | | 1

**Table 9a** Early Man fauna: representation by level
Table 9b Early Man fauna: faunal diversity, numbers of individuals and weight of meat by level.

<table>
<thead>
<tr>
<th>Level</th>
<th>Number of taxa</th>
<th>Number of individuals</th>
<th>Number/volume of deposit</th>
<th>Weight of meat (kg)</th>
<th>Weight/volume</th>
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</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>4 &amp; 5</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
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<tr>
<td>7</td>
<td>8</td>
<td>15</td>
<td>5</td>
<td>37.5</td>
<td>12.5</td>
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<tr>
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<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>9</td>
<td>14.3</td>
<td>30.3</td>
<td>6-10</td>
</tr>
</tbody>
</table>

1 Volume of deposit in Level 8 is variable

All of the species are tropical woodland/open forest species and all (except the extinct *Sarcoptilus* and possibly *Bettongia tropica*) could probably be found in the area today. In this sense there is no evidence for habitat change through time. However Levels 6 and 7 both have a higher faunal diversity than Level 8 and if the two are considered together, there are 11 species and 32 individuals as against six species and nine individuals in Level 8. This considerably greater faunal diversity in Levels 6 and 7 may be the result of slightly different climatic conditions to those of Level 8.

Most of the bone remains seem to be concentrated in the area away from the wall of the shelter. In Levels 7 and 8 the greatest weight of bone is in square B5, suggesting that bones may have been pushed over the edge of the rock platform. It also suggests that the excavated portion may not include the areas of greatest bone concentration.

**DISCUSSION**

The faunal evidence from the site seems of doubtful reliability when we consider the low weight of meat represented and the possibility that the area of greatest bone concentration may not have been excavated. However, there are some positive aspects which should be stressed. Wright (1971) found only a few corroded fragments of bone in the upper layers and nothing in the lower layers of his site, indicating that bone was gradually being destroyed by acidity and had been completely lost with time. This is not the situation in the Early Man Shelter. First, the greatest weight of bone occurs in the middle of the sequence of Levels 8–6. Second, even if the flaking and pitting seen on some bone is corrosion, only about one-quarter of the bones is affected at the lowest level and only 6% by Level 6. All of these bones are recognisable, so that little, if any, information is being lost because of the process. The fact that the majority of bones is unaffected suggests that it is weathering of bones not quickly buried, rather than corrosion occurring after deposition which should affect all bones at a particular level.

The most likely explanations for the small amount of bone are:

1. Bone is more concentrated in other parts of the shelter.
2. Some bone was removed from the shelter before it could be incorporated into the deposit.
3. A large amount of food was eaten away from the shelter.
4. The diet contained a high proportion of plant food.
5. Few people used the shelter or used it for very short periods.

There is some evidence for both of the first two possibilities. However, it is difficult to believe that so much bone is concentrated in other parts of the shelter that it would radically alter the total meat weight calculations. It is also difficult to believe that all kangaroo bones, down to isolated teeth and small foot bones, were systematically cleaned out. For these reasons the other explanations seem to me more likely.

The virtual absence of bone above Level 6 seems open to the same sort of explanations. The abruptness of the change from the large quantities of well
preserved bone in Level 6 to almost nothing in Level 5 suggests that physical decay processes are not responsible. It also seems unlikely that the proportion of plant food in the diet could have changed sufficiently to account for the drop in meat weight. The most likely explanations are that even fewer people were using the site for shorter times and/or that even more of the food was consumed away from the site.

For the reasons discussed above, and also because there is unlikely to be a differential distribution of species remains within a site (as distinct from differential distribution of particular skeletal parts in the shelter), the proportions of different species, and the changes in these proportions through time, are probably essentially correct.

The restricted range of food available and utilised at Laura (no fish, virtually no bird), and the low weight of meat, both suggest that the site may have been occupied only seasonally, perhaps during the wet season when the lower areas were flooded. The absence of emu, which is represented in the rock art of the site, and of brush turkey, which is reasonably common in the area today, is somewhat surprising.

The fact that rock wallaby is the dominant species in numbers but not in meat weight indicates that neither of these factors should be considered alone. The weight of meat may be a more realistic figure in terms of diet, but it still poses problems. First, if meat is not being stored, then getting a rock wallaby to eat every week may be more important to survival than getting a kangaroo every three months. Second, the weight of meat does not take into account the effort expended in obtaining it. It may well be more time-consuming and arduous to obtain ten rock wallabies than one kangaroo, but if kangaroos are not easy to catch, or are scarce, then the energy must be expended to obtain the wallabies. At Laura, approximately 40% of the animals caught were rock wallabies and these supplied about 36% of the total meat. Kangaroo and large wallaby are only about 14% of the animals caught but supplied half the total meat. Clearly, more time was spent collecting rock wallabies, although less meat was obtained as a result. They were probably a constant source of food which could be relied on, being restricted to rock areas around the site, whereas the kangaroo supply was more uncertain. Both aspects of species abundance need to be considered at all sites.
IV MAMMALS OF THE LAURA DISTRICT

J.W. Winter

Laura lies near the southern extremity of the plainlands of the Laura basin and close to the sandstone plateau which contains the basin to the east and to the south. Thus the mammals are likely to reflect a division based on differences in topography of the district.

Horton (Chapter III) has described the faunal remains from the Early Man Shelter 17 km to the east of Laura. The shelter thus lies on the interface between plainlands and plateau and the faunal remains are possibly drawn from two distinct faunal assemblages.

DESCRIPTION OF THE AREA

Three different ecological zones can be distinguished within the district on the basis of topography and vegetation characteristics (Fig. 20).

Zone I: Smooth Plainlands ('Floodplains')

These are plainlands with extremely low relief (less than 6 m) adjacent to the coast of Princess Charlotte Bay. The vegetation consists of fringing mangroves (Vegetation Type 9, Pedley and Isbell 1971), extensive areas of salt...
pans (Type 10), open grasslands (Type 8), melaleuca woodland (Type 6a) and eucalypt woodland (Type 4c).

Zone II: Undulating Plainlands (Sand Ridge Country)

Further inland the relief increases in height from 6-30 m and these plainlands are relatively better drained. The most characteristic vegetation is open forest containing the stringybark Eucalyptus tetradonta (Type 2a). Small discontinuous strips of sclerophyll vine forest and deciduous vine thicket (Webb 1959) occur along the rivers in both types of plainlands.

Zone III: Hilly Ground

The hilly ground has a greater relief than the plainlands. The greatest relief, 60-120 m, is to the east and south where a sandstone plateau is deeply incised by the Normanby and Laura Rivers. Bloodwood - box woodland (Type 4d) is characteristic of the valley floors, with a more stunted woodland (Type 3a) on the upper slopes and plateau. Small pockets of vine forest occur along the sandstone bluffs, usually comprising a few trees only. However one vine forest in Quinkan Creek extends to approximately 150 x 400 m.

MAMMAL SPECIES PRESENT

Methods of Investigation

These notes are based on a five-day visit to Laura, 16-20 August 1975, by myself in company with J. Harris, Department of Geography, University College, London. They have been supplemented by occasional observations made since 1973 by personnel of the Queensland National Parks and Wildlife Service (R.G. Atherton, B.J. Lyon, G.J. Rees, C.R.R. Roff, C.M. Weaver and myself). Records from the Queensland Museum and published sources have also been incorporated. Observational records are followed by the observer's initials and Queensland Museum numbers are given for specimens collected.

The ecological zone in which the record was made is given by Roman numerals in brackets, (?) when unknown and (NA) when not applicable.

Native Species Recorded

1. Echidna (Tachyglossus aculeatus)
   20 km NW of Laura (RGA) (II)

2. Agile wallaby (Macropus agilis)
   Abundant in (I), common in (II), but not observed in (III) (all observers)
   2-3 km W of Lakeland Downs (QM JM1258) (II); the plains in the immediate vicinity of Lakeland Downs are regarded as Type II. Between Marina Plains and Musgrave (QM JM1822) (I)

3. Antilopine kangaroo (Macropus antilopinus)
   Between Healey Creek and Morehead River, 10-28 km NW of Kalinga (CMW) (I)
   4 km SE of Kalinga (CMW) (II)
   Oakey Creek, 9 km W of Cooktown (e.g. QM JM740) (II)

4. Eastern grey kangaroo (Macropus giganteus)
   11 km NNW of Laura (JNW) (II)
   Between Kennedy and North Kennedy Rivers, 30-55 km NW of Laura (CMW) (II)
   5 km SW of Caulders Lake, 30 km SSE of Lakefield (BJL) (II)
   4-9 km N of Musgrave (JNW, RGA) (II)

5. Wallaroo (Macropus robustus)
   15-20 km SE of Laura (CMW) (III)
   Bloodwood ridges between Laura and Kalinga (CMW) (II)
6. Whiptail wallaby (*Macropus parryi*)
   15 km WNW of Lakeland Downs (CMW, GJR) (II)
   8 km SW of Cooktown (QM J10753-6) (?)
   These are the two most northwesterly and northerly localities for the species, but it may extend, or may have extended, into the sandstone country close to Laura (see Tate 1952)

7. Swamp wallaby (*Wallabia bicolor*)
   25 km N of Musgrave (CMW) (I)
   In thick tall grass in the vicinity of Walker's Hill and Ward's Hill, 25 km N of Lakefield (BJL) (I)
   Also seen in dense blady grass in hilly country in the vicinity of Coen (JWW, RGA) (NA)

8. Northern nailtail wallaby (*Onychogalea unguifera*)
   Grasslands 5 km NW of Marina Plains (CMW, CRRR) (I)
   Marrett River, 35 km NNE of Lakefield (CMW) (I)
   Grasslands between the Marrett and Normanby Rivers, 40 km N of Lakefield (CMW, GJR) (I)
   Grasslands 3 km E of Jane Table Hill, 48 km N of Lakefield (BJL) (I)

9. Godman's rock wallaby (*Petrogale penicillata godmani*)
   Quinkan Creek 10 km SE of Laura (JWW) (III)
   Droppings numerous along sandstone bluffs SE of Laura (JWW) (III)

10. Spectacled hare-wallaby (*Lagorchestes conspicillatus*)
    Between Laura and Musgrave (CMW) (II)
    25 km SE of Kalinga (QM J2710) (II)

11. Common brushtail possum (*Trichosurus vulpecula*)
    Kalinga (CMW) (II)
    Approximately 20 km NW of Kalinga (CMW) (II)
    Several between Cattle and Kennedy Creeks, 10-15 km SE of Laura (JWW, RGA) (II)
    '6 mile' water hole, Laura River, 30 km N of Laura (BJL) (I)
    '12 mile' water hole, Normanby River, 40 km N of Laura (BJL) (I)

12. Sugar glider (*Petaurus breviceps*)
    Approximately 40 km NE of Laura (JWW) (II)
    11 km NNE of Laura (JWW) (II)

13. Black-footed tree-rat (*Mesembriomys gouldii*)
    11.5 km SE of Laura (QM JM 2708) (III)

14. Lakeland Downs mouse (*Leggadina lakedownensis*)
    Williams Island between North Kennedy and Bizant Rivers, 35 km NNW of Lakefield (Watts 1976, QM J17919) (I)
    Lakeland Downs (Watts 1976, QM JM1292) (II)

15. Little red flying fox (*Pteropus scapulatus*)
    Abundant feeding on blossom of *Eucalyptus tetrodonta* in vicinity of Laura (JWW) (II)
    4 km W of Laura (QM JM2705-7) (II)
    Abundant Laura to Lakefield (BJL) (I and III)
    16 km SSE of Musgrave (QM JM1821) (II)
    Hann River, Kalinga (Tate 1952) (II)

16. Black flying fox (*Pteropus alecto*)
    Old Laura Station homestead, 24 km N of Laura (JWW) (I)

17. Eastern horseshoe bat (*Rhinolophus megaphyllus*)
    Laura (Tate 1952) (II)

18. Dingo (*Canis familiaris*)
    10 km N of Laura (RGA) (II)
Native Species Possibly Present

There are additional species not recorded but which may occur, since the Laura district lies within or adjacent to the known distribution of the species (Tate 1952; Troughton 1967; Marlow 1968; Ride 1970; Taylor and Horner 1973; Covacevich and Easton 1974; Gordon 1974; Archer 1976; Robinson et al. 1978).

1. Common planigale (Planigale maculatus)
2. Red-cheeked dunnart (Sminthopsis virginiae)
3. Northern quoll (Dasyurus hallucatus)
4. Long-nosed bandicoot (Perameles nasuta)
5. Brindled bandicoot (Isoodon macraurus)
6. Feathertail glider (Acrobates pygmaeus)
7. Common ringtail possum (Pseudocheirus peregrinus)
8. Dusky field-rat (Rattus auorum)
9. Pale field-rat (Rattus tumneyi)
10. Delicate mouse (Pseudomys delicatulus)
11. Common rock-rat (Zygomys argurus)
12. Grassland melomys (Melomys burtoni)
13. Australian water rat (Hydromys chrysogaster)
14. Spectacled flying fox (Pteropus conspicillatus)
15. Queensland tube-nosed bat (Nyctimene robinsoni)
16. Queensland blossom-bat (Sycoscycteris australis)
17. Microchiroptera - a number of species are likely to occur in the Laura district, but no attempt is made to list them, as published information on range and habitat requirements is sparse. The most recent information on distribution is to be found in Hall and Richards (1979).

Recently Introduced Species

1. Black rat (Rattus rattus)
   13 km N of Laura (Robinson et al. 1978, QM JM845, JM705) (II)
   Laura township (QM JM1262) (NA)
2. Feral pig (Sus scrofa)
   Old Laura Station homestead, 24 km N of Laura (JWW) (I)
3. Feral cat (Felis catus)
   Approximately 40 km NE of Laura (JWW) (II)
4. Cattle (Bos spp.)
5. Horse (Equus caballus)
6. Domestic dog (Canis familiaris)

DISCUSSION

Ecological Distribution of Species

There are sufficient records for the macropods, the brush-tail possum, the sugar glider and the little red flying-fox to indicate a separation of faunal assemblages on the basis of ecological regions (Table 10). In the table the observations have been supplemented by assumed records where this is justified on the basis of available information. For example, the swamp wallaby is known to prefer dense ground cover and is likely to be found wherever this occurs, irrespective of region. The little red flying-fox is very mobile and feeds wherever eucalypt and other blossoms are available. The whip-tailed wallaby in its range south of Cooktown prefers hilly ground (Bell 1973) and is found in the same type of country as the wallaroo.

Species which appear to have the most restricted distribution are the northern nail-tail wallaby, the rock wallaby and the grey kangaroo (Table 10). The former is restricted to the open grassland areas of the 'floodplains' (Zone
Table 10  Laura district: distribution of some mammals by ecological zone.

<table>
<thead>
<tr>
<th>Species</th>
<th>Ecological zone I</th>
<th>Ecological zone II</th>
<th>Ecological zone III</th>
<th>Number of zones used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern nailtail (Onychogalea unguifera)</td>
<td>Smooth plainlands</td>
<td>Undulating plainlands</td>
<td>Hilly ground</td>
<td>1</td>
</tr>
<tr>
<td>Eastern grey kangaroo (Macropus giganteus)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Godman’s rock wallaby (Petrogale penicillata godmani)</td>
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<tr>
<td>Agile wallaby (Macropus agiliis)</td>
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<tr>
<td>Antilopine kangaroo (Macropus antilopinus)</td>
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<tr>
<td>Wallaroo (Macropus robustus)</td>
<td></td>
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<td></td>
<td>2</td>
</tr>
<tr>
<td>Whiptail wallaby (Macropus parryi)</td>
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<td></td>
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<tr>
<td>Common brushtail possum (Trichosurus vulpecula)</td>
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<td></td>
<td></td>
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<tr>
<td>Swamp wallaby (Wallabia bicolor)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Little red flying fox (Pteropus scapulatus)</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Sugar glider (Petaurus breviceps)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- = observed; • = inferred

I), the second to the rocky outcrops of the sandstone plateau (Zone III) and the third to the undulating plains (Zone II).

Most species, however, show some overlap. Agile wallabies are abundant on the 'floodplains' but are also common on the undulating plains. Antilopine kangaroos occur in both the above regions but appear to avoid the extensive grasslands and salt pans of the 'floodplains' and possibly the higher ground of the undulating plains. Wallaroos are typically a species of the hilly ground but also occur on ridges in the undulating plains.

Other species such as the swamp wallaby, brushtail possum and little red flying-fox occur wherever suitable habitat is available.

Comparisons with Early Man Fauna

The hunters from the Early Man Shelter would have had access to the fauna of the undulating plains (Zone II) and the sandstone plateau (Zone III). All mammal species described from the rock shelter by Horton (Chapter III) and which were also recorded as present in this survey, fall into these two groups. This suggests that there has been no major shift in faunal distribution since the time of the hunters of the rock shelter. The absence of a bandicoot (Peramelidae) from the observed records of extant mammals is most likely to be an oversight of the survey techniques rather than an actual absence from the area.

Bettongia tropica, the northern bettong, is another species not recorded in the present survey. The most northerly record of a living specimen of this species is from Mt Spurgeon, 130 km SE of Laura (Wakefield 1967). All three localities where this species has been seen (Ravenshoe, Mt Spurgeon - Wakefield 1967, Davies Creek - Sharman et al. 1980) are hilly open-forest habitats. It is possible, therefore, that with more intensive searching this cryptic animal will be found in the sandstone plateau formations in the vicinity of Laura.

Nevertheless there has been a definite change in the fauna in the vicinity of the Early Man Shelter as demonstrated by the occurrence of Sarcophilus sp. (Horton 1977). This is a genus that is now extinct on mainland Australia.

Horton (Chapter III) was unable to distinguish between Macropus agiliis and M. parryi and between M. robustus and M. antilopinus from the fragments of bone available. The separation of mammals on the basis of ecological zones presented here is too general to help elucidate this problem. However, a more detailed study of the hunting range of the rock shelter users (see site catchment analysis, Vita-Finzi and Higgs 1970; Cassels 1972), the habitats within this hunting range and hence the species of animals likely to have been encountered may help clarify the problem.
Rock engravings occur in shelters and on exposed rock surfaces throughout the Laura area. They vary in technique, in style and in their degree of patination and they present a very heterogeneous body of art.

In their paper on 'Petroglyphs of Cape York Peninsula', Woolston and Trezise (1969) revealed some of the diversity of this art and tentatively proposed a two-phase chronological sequence for it: an early phase of non-figurative motifs and a later phase of figurative motifs. Under the continuing programme of exploration and recording by Trezise, many new engraving sites have been and are being found and new records are regularly added to the archives of the Australian Institute of Aboriginal Studies (AIAS). There is by now a sufficiently large body of additional information available to warrant a re-examination of the situation as evaluated in 1969 by Woolston and Trezise.

The purposes of this chapter are several. It presents additional data in order to attempt to define more precisely than was possible in 1969 the range of motifs and techniques of the art and to search for recurring assemblages of associated motifs. It is clear that a two-fold division of the engravings as proposed by Woolston and Trezise remains valid, but the categories of this division need elaboration, while the chronological relationship between the two motif ranges now appears more complicated than was suggested in their paper. Finally, the question of the identification of bird tracks in both motif assemblages requires further discussion.

DATING THE ROCK ENGRAVINGS

Superposition

Superpositions of engravings which can be analysed in terms of their relative chronologies are very rare. Most shelters with engravings also contain paintings and in the majority of instances where paintings and engravings are superimposed, the paintings are the more recent. There are some instances, however, in which engravings, including non-figurative engravings, are over the paintings. In any case the chronology of the various painting styles of the area is still far from fully understood. There is, therefore, too little information available to base the relative chronological position of the figurative and the non-figurative engravings on superposition studies.

Patination

Woolston and Trezise (1969:126-7) refer to the generally more heavily patinated nature of their Phase 1 engravings. Although this observation remains valid for a large number of non-figurative engravings, a large number of exceptions is now known. Reliance on the relative degree of patina of engravings as an indication of relative age is notoriously problematical, since the rate of patination of rock art depends on the interplay of a large number of variables, including factors of rock petrology, the environmental history of the site and the relative rates of physical and chemical weathering. In any case, in the absence of thin sections of the patinated surfaces, only surface patina conditions can be observed in the field and no account can be taken of the depths to which weathering processes have penetrated. In view of the rather crude and highly subjective criteria that pertain to field observations of weathering and patina on rock engravings, any elaborate system of patina rating as a means of establishing relative chronologies must be highly suspect. For the Laura region it is considered that at best a three-point scale of patina rating may be applied to the engravings to attempt some assessment of their broad chronological relationships: 'fully patinated', in which the engraved surface is of the same colour as the surrounding rock, 'moderately patinated' in which the engravings show some weathering effects, and 'fresh', for engravings on which no weathering effects can be observed by the naked eye. Any chronological significance attached
to these grades of patina must, however, take account of conditions of exposure of the engravings.

The deposition of a veneer of silica which occurs in a few sites of the Laura region reflects conditions of relatively high temperatures and some rock humidity, under which the solubility of silica approximates to or exceeds that of the sesquioxides. The occurrence of silica gloss on surfaces exposed to isolation in Laura shelters suggests that it is the effect of direct radiation from the sun, where rock temperatures may soar well above ambient temperatures, that has resulted in silica deposition. To explain this occurrence there is no reason to postulate a climatic period significantly different from the present. The deposition of a veneer of silica, however, is generally considered to be a relatively 'slow' process and its presence on rock engravings therefore indicates 'some antiquity' for the art.

Excavation

Two reference points for the chronology of rock engravings in the Laura area have been established by radiocarbon dating of the Early Man excavations. The dates obtained, however, are minimum ones for the two engraving styles at that site, ca. 13,000 BP for the earlier styles and ca. 4000-5000 BP for the later (see pp.33-34). They give no indication of the duration of the styles in question.

TECHNIQUES OF ENGRAVING

In her study of Australian rock art, Maynard (1977) makes the valid technological distinction between pecking, pounding and engraving sensu stricto. However, the currently ingrained practice in the Australian literature is to use 'engraving' as a general term referring to all petroglyphs and this practice is adopted here for the sake of consistency. The term 'incision' (or 'incised') will be used to describe the rare instances of true engraving, which is produced with a hard and pointed implement.

In practice (see Maynard 1977:392) the distinction between pecking and pounding is difficult to identify in prehistoric rock art. Weathering and corrosion may so blur the outline that the initially sharper, more precise outline of a pecked engraving no longer differs from the blurred outline of a pounded figure. However, since it is normally possible to produce significantly deeper marks by pecking than by pounding on the same rock, any relatively deep engravings can generally be assumed to have required more elaborate preparation than mere hammer-dressing.

Four different techniques, incision, abrasion, pounding and pecking, were employed in the Laura region and it is possible to make some further subdivisions of these technological processes.

Incision

A few figures in Quinkan Gallery, Shelter B5, have finely incised marks, one of which depicts a snake-like figure. They are mostly very faint and not clearly decipherable (Trezise 1971:48). Incisions also occur across the thick white paint on a painted fish in shelter B of the St George River group of shelters (see p.66).

Abrasion

Only one instance of an abraded design has been identified, at the Pitted Rock Shelter (see p.78).

Pounding

Pounded figures predominate among the Laura rock engravings and two distinct types of pounding can be distinguished: relief pounding and bruising.
Relief pounding

This is produced when the rock is hit sufficiently hard to remove at least a several millimetre thickness of rock, leaving a mark of visible depth. By juxtaposing and/or overlapping many relief-pounding marks, an area of lower relief than the surrounding rock is produced. Generally, its edges have a scalloped and somewhat diffuse appearance. When freshly made, a relief-pounded design may show up by virtue of a colour difference between the pounded rock and its surround, as well as by negative relief. Chemical patination processes, as opposed to attrition by physical weathering, do not obliterate the figure.

Bruising

This consists of such very shallow pounding that the mark produced does not have any visible depth (i.e. no greater than the natural texture of the rock surface). On greyish rocks freshly bruised marks show up as patches of whitish crushed rock but these become less sharp as the powdery crushed surface wears off, and they disappear as the surface patinates back to the exposed rock colour. Only one such figure has been identified, at the Emu Dreaming Site (see p.72).

On many shelters in the Laura region, the rock surface consists of a thin, hard, dark crust over the red, iron-stained weathered layer of the sandstone. Bruising of these surfaces causes the break-up of the dark outer crust and produces a red design against a darker background, with negligible depth. Newly made relief-pounded designs on these rock surfaces result in the same colour contrast. There are some engravings which have low and variable depths in which the technique ranges from heavy bruising to shallow relief pounding. For such very shallow engravings it is not always clear whether the prime intention was merely to create a colour differentiation or whether differential depth of the design was also intended.

Present weathering processes on these dark rock surfaces result in the splitting and flaking of the dark crust which reveals a reddish rock surface. Naturally weathered surfaces tend to present a mottled appearance and there are many instances where bruised designs, identified on the basis of their regularity of form, seem to merge into amorphous zones of reddish and mottled red and black rock surfaces. It is sometimes difficult to assess whether a colour differentiated rock surface results from natural weathering or from human interference. Furthermore, the frequent association of identifiable bruised patterns with diffuse breakdown of the black crust suggests that the effect of human activity on the rock surface may at times have precipitated or at least intensified natural weathering processes. Any initial break in the outer crust causes a focus for corrosion processes and tends to result in the intensification of salt efflorescences which cause the crust to break and flake off.

Battered ridges:

In several sites natural ridges of the shelter wall, such as bedding ridges, have been marked by pounding and bruising.

Pecking

Pecking can be unambiguously identified in only one shelter, Shelter F of the St George group (see p.68). There are, however, many engravings with a considerably greater depth than is produced on any clearly pounded designs. It is therefore probable that for some of the rock art a technique of pecking the rock with a hard sharp implement was employed. Since nearly all relatively deep engravings have worn and corroded edges, it is no longer possible to assess the degree of edge control that pecking entailed, i.e. whether it was carried out with a punch or simply by direct percussion (see Maynard 1977).

ENGRAVED MOTIFS
(Fig.21)

As already mentioned, the motifs of Laura rock engravings cover both figurative and non-figurative subjects. The motifs of figurative engravings are
Fig. 21  Key to non-figurative motifs of Laura rock engravings

- Pits: in a cluster, in a row
- Tridents: with spur, joined tridents
- Rectilinear maze
- Enclosures: complete - with hollow and trident, partial - with grid design
- Rings: incomplete
- Discs
- Radiating form
- Stars: symmetrical, asymmetrical
also found among the paintings, but the range of subject matter of the paintings is far greater and includes a much wider elaboration of detail and styles. Figurative items among the engravings are usually easy to identify at a general level, e.g. human, male or female, turtle, macropod track, bird track and the like.

The identification of bird tracks is sometimes ambiguous. With very little simplification the fully shaped bird track can be transformed into a linear three-pronged fork design, or trident (see Fig.21). Both fairly naturalistic bird tracks and linear tridents occur among the Laura rock engravings. All have been identified as bird tracks in the descriptions given by Woolston and Trezise. However, as shown in the analysis of the pecked frieze at the Early Man Main Shelter (see pp.55-60), trident designs also occur in various combinations with other design elements to form more complex configurations. It is clear that the linear trident design, as a symbol, was used both singly and as a component of other designs. This suggests that there was a significant conceptual difference between the linear trident and the recognisably shaped bird track. In rare instances, as at the Emu Gallery (see Fig.34), the distinction between bird track and trident seems blurred by intermediate forms which may indicate the initial derivation of linear trident designs from the representations of bird tracks. In view of the different artistic uses made of the two forms, they are treated as separate motifs in this paper, without prejudice as to their respective figurative or symbolic content.

There are a large number of designs for which no figurative model can be recognised and the descriptive terms used for these are not intended to convey likely meaning (Fig.21). Most terms employed are self-explanatory, e.g. pits, rings, rounded enclosures, dînas, rectilinear mazes (consisting mainly of relatively straight lines) and curvilinear mazes (consisting mainly of intensely curved or sinuous lines). Radiating forms are patterns of lines or bands which converge on to a broadly defined point or zone; they are generally rather asymmetrical. The term star is restricted to radiating designs in which the rays are of approximately equal lengths and converge on to a point; stars are not necessarily symmetrical.

LOCATION OF MOTIFS

The location of motifs on the rock face may be considered from the point of view of the artist's approach to his work, whether carried out in a crouched or sitting position: 'low on the wall'; largely in a standing position: 'at standing level'; by reaching up or standing on something higher than present ground level: 'high on the wall'. Since the aim of this study is to search for regularities of design, execution and, where possible, relative age in an apparently heterogeneous body of rock art, rather than to deal with the detailed spatial relationships of designs, these three criteria are the ones used to described the location of art on the rock walls. References to ledges, niches and the like are included when they are relevant to the preservation conditions of the art or when natural rock features appear to have influenced either the form or the location of engravings (e.g. as at the Early Man Shelter, see p.55.

DESCRIPTIONS OF ENGRAVED SITES OF THE LAURA AREA

The site descriptions which follow are based on my own field observations, except where otherwise indicated. Supplementary information is included from the vast body of records deposited by Trezise in AIAS archives. Site locations are shown in Figure 1.

THE EARLY MAN MAIN SHELTER

The excavation described in Chapter II took place in the main shelter of a group, other members of which are described later.
The Engraved Frieze (Fig. 22a, b, c)

The extent and conditions of preservation of the engraved frieze at the Main Shelter have been discussed in the context of the excavations (p. 30) together with the evidence for its final Pleistocene date (p. 12).

Some natural features of the rock surface have influenced both the location and morphology of certain pecked zones of the frieze. The overall orientation of the frieze shows alignment to bedding features of the rock surface and also of the surface of the bedrock exposed at the base of the excavation, and not the horizontal floor formed by the sandy deposits. In section B a row of short vertical strokes is aligned immediately below a short bedding ridge (Fig. 22b). The vertical ridge on the wall has clearly broken any continuity of design between the peckings on sections B and C.

Natural rounded depressions in the rock have also acted as foci for pecking. In section C is a row of four sharply delimited natural depressions which have been outlined on their outer edges by a line of pecking; three of these depressions also contain a central pecked mark, a short stroke in two of them and a trident shape in the largest (Fig. 22c). In section A two natural rounded depressions have fairly complex pecked designs. These consist of an enclosing line which follows the inner contour of the depression fairly closely and from which other pecked lines radiate. Inside each of the enclosures is a pecked grid design. The uppermost of the two natural hollows is figure 8-shaped and the pecked enclosure follows the lower half (Fig. 22a: centre). It encloses a right-angled grid of two horizontal and four more or less vertical lines; five radiating lines emerge from the lower rim of the circle and continue outside the rock hollow. Below this is a larger oval depression whose upper limit merges gradually with the general level of the rock wall. Where the edge of the natural feature is clearly discernible, its inner margin has been marked by pecking. This incomplete pecked enclosure, oval in shape, also contains a grid-like design which is, however, considerably less regular than that described above and which is partly obscured by corrosion. There is also a trident shape attached to (or superimposed on/under?) the grid. The lower margin of the oval has three lines, and possibly a fourth, radiating out, which join with other pecked lines, including trident shapes.

Although the natural features of the rock wall appear to have markedly influenced the structuring of the frieze, they do not appear to have had a totally controlling effect on its construction. Similar designs have been found divorced from obvious natural rock features and a number of natural ridges and hollows are not marked by rock pecking.

Fig. 22 Shelter wall, showing location of Figs 22a, b and c.
Fig. 22a  Frieze of rock peckings: left hand section, corresponding to areas D4-D5 of the excavation.
Recurrent Motifs (cf. Fig. 21)

A number of repeated design elements can be identified, recurring either singly, in groups or attached to other elements and lines. These are pits, tridents, enclosures and grids.

Pits

A cluster of irregular pits occurs near the middle of section A (Fig. 22a). Some isolated pits also occur sporadically in other parts of the frieze.

Tridents

These consist of three convergent lines, the outer two of which are frequently curved. With one exception, the three prongs always point upwards. Elaborations of this design are common and include tridents in which the centre
line projects down into a 'spur' whose length may vary from shorter to considerably longer than the trident prongs. Tridents may appear to be joined one above the other by such spurs. There is one instance, in section C (Fig. 22c), of two tridents which are joined 'back to back' by a spur. This is the configuration which comprises the only example of a trident pointing downwards. There are two instances of tridents on which the centre prong ends in a loop; one is in the upper left-hand part of section A (Fig. 22a) and the other among a number of tridents joined by other lines in the middle of section C, to the left of the row of natural hollows (Fig. 22c). Finally, in section C (Fig. 22c) there are two and possibly three tridents in which the centre prong curves around to meet one of the lateral prongs.

Enclosures, complete or partial

There are a number of rounded enclosures, some of which have already been described in connection with the effect of natural rock depressions. Some merely enclose a space, others further pecked designs which may comprise one of the following: vertical lines, some of which protrude beyond the enclosure (upper right of section A, Fig. 22a); a combination of vertical and horizontal lines which form grid-like designs, again protruding outside the enclosure (three examples in section A, Fig. 22a); a trident or other small mark within a complete enclosure (three in section C, Fig. 22c).
Grids and grid-like designs

There are only three configurations which consist of overlapping sets of lines more or less at right angles and all three are contained within enclosures. Thus, unlike the other design elements described, they do not occur in isolation but in each case appear both to mark an enclosed space and to join with further designs outside the enclosure.

General remarks

No other recurring patterns can be discerned among the numerous other pecked lines and configurations of the frieze. One long, inverted U-shape in section B (Fig.22b) is the only example of a configuration which has been isolated as a recurring element in engraved sites of central Queensland (Quinnell 1972). Its unique occurrence at the Early Man Shelter precludes its isolation as a consistent element at this site.

The Engraved Slab (Fig.23)

The slab excavated at the Main Shelter contains two peckings in relief-pounded technique, one of which is probably a bird track. The other is too fragmentary to identify any design. Its age has been estimated as around 4000-5000 BP (p.29).
The Rock Platform Site (Fig. 24)

The very weathered engravings on the Rock Platform are in relief-pounded technique and represent tracks. They consist of pairs of macropod hind tracks, one small track which could be a macropod forefoot, dingo or possum, and human footprints. The chronological status of the engravings is discussed in Chapter II (pp. 33-34).

Fig. 24  Rock Platform site: a, macropod tracks and axe grinding grooves; b, macropod and human tracks and axe grinding groove. The axe grinding groove partly overlaps two human tracks.
OTHER EARLY MAN SHELTERS

Two other shelters in the group contain numerous engravings, the Collapsed Shelter and Shelter H. In addition, three small shelters along the slopes of the Early Man Creek contain a few engravings: two tridents at ground level in a small shelter at the foot of the escarpment, east of the Main Shelter; three tridents along a low ledge in a small shelter downslope from the Main Shelter and two tridents, a ring and pits on the rock face of a large sandstone block with a very slight overhang. All these occurrences are deeply patinated and, in the last shelter, also very worn.

Early Man Shelter H (Fig. 25)

This is a small shelter in the escarpment at the head of the Early Man Creek. It contains a few faded paintings partly superimposed on very shallow engravings which show up as paler marks against the dark patina crust of the rock. The engravings have very irregular outlines, partly as a result of flaking of the rock on their edges, while others consist of discontinuous lines or clusters of peck marks, so that regularities of design are difficult to discern on the rock face. All, however, consist of non-figurative linear patterns.

Trident designs occur, singly, back-to-back and joined by a spur (Fig. 25a). A design resembling the Greek letter phi (ϕ) with forked base (Fig. 25b) appears twice, and asymmetrical star shapes occur (Fig. 25b) which are similar to those at the Mounted Horse Galleries (see Plate 25). Finally, there are meandering lines which form curvilinear mazes, as well as one rectilinear maze (Fig. 25c).

Some of the trident configurations and the phi (ϕ) figures at this shelter (Fig. 25b) have a superficial resemblance to a common and widespread convention for showing the human form, known as 'stick figures'. Although a very narrow and elongated schematisation of the human form occurs in many painted shelters of the area, truly linear stick figures are very rare. They are known from paintings in a shelter on the Mossman River, where they are shown with arms both spread out and akimbo. These latter have an angular form. However, by rounding off the 'elbow' of such a stick figure a phi (ϕ) shape would result. A figurative anthropomorphic origin for these engraved figures at Shelter H cannot be ruled out. However, it is theoretically equally simple to derive the phi (ϕ) configuration by slight modification of the 'back to back' trident configurations which are common among engravings of the region; furthermore at the Early Man Main shelter there are some tridents in which a curved prong forms a loop with the central prong. A derivation of the phi (ϕ) configuration from trident designs is therefore considered more probable on present evidence.

Fig. 25 Early Man Shelter H: a, tridents
Fig. 25 Early Man Shelter H: b, engravings resembling the Greek letter 'phi' (φ), c, rectilinear maze and meandering lines
Early Man Collapsed Shelter (Fig. 26)

This is a small shelter at the base of the escarpment east of the Main Shelter which shows evidence of extensive roof collapse. Some fragments of rock on the shelter floor retain traces of engraving, but none sufficiently extensive to recognise any pattern. Much of the shelter wall is obliterated by rubble and sand, but some engravings can be seen, as well as a few faint hand stencils.
Early Man Collapsed Shelter: a, curvilinear maze, the base of which is covered by deposit; 
b, faint and discontinuous curvilinear design; c, tridents; pits and to the right, a horizontal 
line with vertical strokes; d, tridents and two V-shaped engravings resembling simplified 
macropod tracks.

The peckings are lightly pounded, except for two fragmentary trident designs 
which are smooth, as if abraded. In view of the very friable nature of the rock 
in this area and the fact that the tridents have partly worn away, the smoothness 
of these engravings is probably the result of erosion rather than abrasion. The 
engravings consist of meandering lines, some of which form curvilinear mazes 
(Fig. 26a,b) and tridents (Fig. 26c,d). There is also a horizontal line crossed 
by short vertical strokes (Fig. 26c). All are now low on the rock wall and appear 
moderately patinated.
ST GEORGE RIVER SHELTERS

This group comprises 12 decorated shelters scattered along the base of an outcrop of sandstone and pebble conglomerate, a few kilometres south of the junction of the St George and Kennedy Rivers. In all shelters which contain exposures of both sandstone and conglomerate the engravings are markedly restricted to the sandstone surfaces. Many of the shelters are shallow with little overhang and much of the art is corroded, except in some particularly sheltered recesses. All but one of the decorated shelters contain both paintings and engravings. Some of the shelters of this group have been described by Woolston and Trezise (1969) and numbered sequentially Bl to B7. However, in order to establish a sequential reference system which comprises all of the decorated shelters of this group, a new system is used here, viz. A to L, from south to north along the outcrop.

Shelter A

The only engravings in this shelter are a row of seven very small pits fairly low on the wall. They are smaller than pits in other shelters and are fairly fresh-looking.

Shelter B (B1 of Woolston and Trezise) (Fig. 27)

A small curvilinear maze is delineated by a partly continuous, partly discontinuous relief-pounded line. It is moderately weathered and shows up as a relatively pale mark on the darker rock. To the left of this are four roughly circular rings, one of which is either incomplete or partly weathered away (Fig.27a). These rings are more deeply engraved than the maze and they are very worn and fully patinated. The two designs are marginally superimposed and the maze clearly overlies the patinated ring. To the left of this group, on a rock ledge, are a row of small pits and a trident (Fig.27b), all of which are fully patinated. The maze and rings are at standing level, the others slightly lower on the wall.

Fig. 27 St. George Shelter B: a, relief pounded curvilinear maze over deeply weathered rings; b, tridents.
Shelter C (B2 of Woolston and Trezise) (Fig. 28)

This is a shallow and elongated shelter which is separated into two distinct parts by a very marked narrow recess in the rock and a discontinuity on the floor, roughly midway along the shelter. Engravings occur only in the northern part of the shelter, although some paintings exist on the sandstone surface throughout most of its length.

The engravings are low down on the sloping rock at the back of the shelter, which is at such a steep angle (30-40°) that it is neither strictly floor nor wall. This surface is fully exposed to insolation and rain and is damaged by exfoliation. The exfoliation surfaces show a wide range of patina colours up to relatively fresh-looking surfaces. The designs are clearly relief-pounded, with individual hammer marks and scalloped edges still visible on most figures. They consist of boomerangs, arcs, a pair of macropod tracks, bird tracks and pits (Fig. 28a-e). The shape and size of the boomerang engravings is such that some at least may have been first outlined by a stencil or tracing method from actual artifacts prior to pounding out the area of the design. Three different types of boomerangs seem to be represented, a symmetrical arc form (Fig. 28a-c), an asymmetrical angled form (Fig. 28d) and an asymmetrical S-shaped form (Fig. 28e). It appears that one boomerang has been subsequently slightly widened and a projection added, because the modifications are less patinated than the main figure (Fig. 28d).

Fig. 28 St. George Shelter C: a, boomerangs including symmetrical and asymmetrical forms and a pair of macropod tracks; b, symmetrically curved boomerangs and short 'bars'; c, arcs and pits; d, angled boomerangs with a projection which is less patinated; e, S-shaped boomerangs.
Shelter D (B3 of Woolston and Trezise) (Fig. 29)

This shelter has a marked overhang giving shade and protection from weathering, so that the paintings (mainly hand stencils) are relatively fresh and even a figure in fragile thick pasty white paint is moderately well preserved. The engravings include a few fresh-looking pits and a pounded oval area at standing level, which is partly overlain by the thick white painting. Two larger figures are deeply pecked linear designs (Fig. 29a,b). One consists of a rectilinear maze and the other of a horizontal line crossed by four short vertical bars. Both are fully patinated and worn. Another pecked design of a short horizontal line with forked ends is less intensely patinated and partly overlies the second of the pecked linear designs. There are also two tridents, a cross (or a splayed-out trident with spur?) and pits. Below the pecked designs is an amorphous band of lightly bruised rock.

![Diagram](image)

Fig. 29  St. George Shelter D: a and b, rectilinear designs and tridents.

Shelter E

This is a very small shelter under a large boulder close to D with some faded hand stencils and no engravings.

Shelter F (B4 and B5 of Woolston and Trezise) (Plates 2, 3)

This is a long shallow shelter with slight overhang and relatively exposed rock wall. A recess at the base of the shelter wall (B4 of Woolston and Trezise) is, however, protected from weathering. It contains an elongated zone of peckings which are deep and have clearly defined edges. This zone comprises a double row of short vertical strokes, pits, some elongated oval lines followed by more pits and ending in (or emerging from?) a group of natural pits and hollows (Plate 2). The track and cross mentioned by Woolston and Trezise (1969:121) was not relocated.

To the right of this recess, at about standing level, are two curvilinear designs produced by shallow relief pounding and two short strokes and pits (B5 of Woolston and Trezise) (Plate 3).
Plate 2  St. George Shelter F: deeply pecked engravings in a sheltered recess.

Plate 3  St. George Shelter F: lightly pounded curvilinear design
Shelter G (B6 of Woolston and Trezise)

This is also a long shelter with very slight overhang. There are few peckings. These include two almost circular rings which are very worn and fully patinated, low on the rock wall. Near ground level are three clusters of pits and, very close to a painted figure near ground level but not overlapping it, is a relatively fresh relief-pounded five-pronged star, markedly asymmetrical as regards the direction of its rays. Several natural ridges have been extensively battered.

Shelter H

In this small shallow shelter the thin patina crust of much of the rock wall is flaking, revealing the red-coloured rock surface in patches of irregular shape and size. It is not possible to ascertain whether this broken surface initially originated from bruised designs or whether it is entirely due to natural weathering. Some sinuous bands of bruised rock in relatively undamaged areas of the wall seem to be artificial, as are also a number of battered bedding plane ridges. A pair of relief-pounded macropod tracks is moderately patinated and some fairly low-lying pits have a silica gloss veneer.

Shelter I (Plate 4)

Close to Shelter H is an elongated shelter with slight overhang. The most striking figure here is a very large red painting of a yam, fairly high on the wall. Many engravings and battered ridges are close to and covered by the yam painting. The engravings are bruised or very shallow relief-pounded engravings of tridents, a double star, a large oval enclosure and rings.

Shelter J (B7 of Woolston and Trezise) (Plate 5)

This is a cliff section with minimal overhang. There are several clusters and rows of pits; the colour of the patina varies between clusters but within any cluster all pits have the same appearance. All must be classified as moderately patinated on the criteria outlined above (pp. 50-51). One long horizontal line with three short vertical strokes emanating downwards from it is parallel to a row of pits, giving the impression of related designs, but the pits are much more heavily patinated (Plate 5). The only complex design identifiable is a relief-pounded radiating from in fairly broad line (Plate 5). Other remnants of engraving are generally badly worn through flaking of the rock surface and patterns can no longer be isolated. Engravings are dispersed over large sections of this shelter wall, mostly at standing level, though some are fairly high.

Shelter K

This is a large shelter on the northern face of the outcrop with generally exposed rock surfaces. The surface of the shelter walls is extensively bruised and/or naturally weathered and numerous natural ridges are battered, even on conglomerate areas of the shelter wall. The identifiable peckings consist of one pair of bird tracks in shallow relief pounding and a shallow relief-pounded pair of macropod tracks which overlies a red painted man. Both sets of tracks show slight patination.

Shelter L

At the head of a moist gully is a large and shady shelter, part of which is totally enclosed, forming a short section of cave. Apart from a few hand stencils there is very little decoration. A few natural ridges have been battered and there is one small curvilinear maze in relief pounding which is fairly fresh-looking.
Plate 4 St. George Shelter I: bruised engraving including an oval enclosure, tridents, a double star motif and battered ridges.

Plate 5 St. George Shelter J: a radiating form in shallow pounding and a row of pits with a less patinated parallel line and short vertical strokes leading to the pits.
THE LITTLE KENNEDY RIVER SHELTERS
(Plate 6)

These are a series of six shelters at the base of an outcrop of sandstone and pebble conglomerate on the western escarpment of the Little Kennedy River, some 30 km south of the Laura to Coen road.

The principal decorated shelter, about 25 m long, has a narrow strip of horizontal sandy floor which then slopes steeply into a deep gully which runs parallel to the cliff face. Approximately in the middle of this shelter a large block of sandstone and conglomerate has become detached from the rock wall (Plate 6). This block has been extensively covered with pits over several of its outward-facing surfaces. No pits or other markings occur on the inward-facing sides, nor on the conglomerate parts of the block. The pits are all intensely worn and patinated red and some have a glossy silica veneer. They are indistinguishable in colour and texture from the rock surfaces on which they occur. Original working marks are no longer identifiable.

The shelter walls contain some paintings but no peckings.

Rows or clusters of intensely worn and patinated pits occur in three of the other shelters, all of which also contain paintings. In two of these the pits lie on horizontal surfaces of natural rock ledges, but they also extend over the side of the ledges. In the third shelter pits form a single row marking the edge of a rock projection. Above this is a faint and shallow pecking, resembling an asymmetrical four-pronged star, also deeply patinated.

EMU DREAMING SITE, JOWALLBINNA
(Fig.30, Plates 7-9)

This is a relatively long shelter (ca. 20 m) on the escarpment overlooking Shepherd's Creek. In the centre of the shelter wall is a very large natural cavity which has a superficial resemblance to the tail, back and neck of an emu, after which the site is named. Recognition of this resemblance is subjective and depends on the selection of one of two possible margins for the neck (Plate 7). Furthermore, although some natural hollows in this shelter have been marked by battering of the edges, there is no indication that the emu-like hollow has been battered, marked or treated in any way.

Rock engravings are distributed at various levels over the shelter wall but not very near to ground level. They comprise fully patinated peckings, reddish moderately patinated engravings which may have been either pounded or pecked and a pattern made by very diffuse bruising which shows up white against the grey rock surface.

The fully patinated pecked designs consist of large numbers of pits, which occur either singly, in clusters or in more or less horizontal alignments. A number of tridents occurs, including variants of the simple trident form: with a spur, with spur ending in a pit, with a spur merging into a second trident below it, and two tridents joined back to back (Fig.30a). Tridents are also integrated as elements within more complex linear designs, notably one of the three irregular radiating forms (Fig.30b). Other forms are a horizontal line crossed by shorter transverse strokes (Plate 9), two pecked rings and a small boomerang-like form. All these designs appear fully patinated. There is also a cluster of clearly shaped bird tracks in relief pounding, with a moderate degree of patina and with the hammer-dressing marks clearly visible (Plate 8).

The diffuse bruised pattern forms a design consisting of a row of ovals attached by short stalks to a horizontal line (Plate 9).

In view of its total lack of patina, the whitish bruised design is likely to be significantly more recent than the peckings which are fully patinated grey. However, to what extent the reddish or yellow patinated designs and the battered edges of natural hollows reflect a significantly more recent age than the fully patinated peckings is hard to assess, for the natural patina of the shelter surface is variable.
Fig. 30 Emu Dreaming site: a, tridents and trident based designs; b, two joined radiating forms, the upper one incorporates a trident.
Plate 6  Little Kennedy River Shelter: large boulder of sandstone and conglomerate covered in deeply patinated pits.

Plate 7  Emu Dreaming site: general view of the shelter, showing the large natural depression said to resemble the shape of an emu.
Plate 8  Emu Dreaming site: engraved bird tracks.

Plate 9  Emu Dreaming site: bruised design of ovals joined by short vertical strokes to a horizontal line.
ZULU HUTS SHELTER
(Trezise, AIAS Archives) (Fig. 31)

This shelter lies in the escarpment above Shepherd's Creek. It contains peckings of pits, tridents and a six-pronged comb design.

Fig. 31 Zulu Huts Shelter: pits, trident and a comb design (after Trezise).

LONESTAR CREEK
(Trezise, AIAS Archives) (Fig. 32)

One shelter of the Lonestar Creek group recorded by Trezise is shown to contain a pecked design which is deep and intensely worn and patinated. It consists of a line with short transverse strokes. At one extremity the line links two natural hollows.

Fig. 32 Lonestar Creek Shelter: deeply pecked design (after Trezise).

LAURA RIVER CROSSING
(Fig. 33)

Horizontal outcrops of sandstone in the riverbed at the road crossing west of Laura are exposed during the dry season but are regularly flooded each wet season. The movement of sand over these rocks causes some variation in the details of rock exposure from year to year, especially at the lower levels most frequently submerged. Most of the engravings dispersed over the sandstone surfaces have been described by Woolston and Trezise (1969). They show a wide
 variation in weathering but all are patinated to the same greyish colour as the bedrock. The engravings consist of areas or bands of small, closely spaced, relief-pounding marks which give the designs a somewhat irregular diffuse outline.

Designs consist largely of tracks: there are macropod tracks, usually paired, human footprints and bird tracks and one trident with spur (Fig. 33h). There are some human figures in silhouette, seen full face and without facial or other physical details (Fig. 33a). One male figure appears to be pierced by a spear, with possibly the remnants of another protruding from his side (Fig. 33b). One female figure has only one arm (Fig. 33c). Other items are less easily identi-
fiable: two figures resemble hafted stone hatchets (Fig. 33d), there is a
turtle-like design (Fig. 33e), a fish-like design (Fig. 33f) and a spindle-shaped
bar with two short transverse strokes which, by analogy with paintings, could
represent a goanna or similar reptile (Fig. 33g). This figure has a long pecked
line leading to it, but of slightly different depth; by analogy with a painting
in the Goanna Shelter of the Early Man group this could represent a speared
goanna. There are also pits, some unidentifiable figures and axe-grinding
grooves.

The subjects and form of these designs, with the exception of the trident
with spur, are similar to those found among the paintings of the Laura region,
but in the sample visible there is a greater emphasis on tracks, whereas other
figurative elements are fewer and without elaboration of detail.

PITTED ROCK SHELTER
(Fig. 34, Plates 10, 11)

This shelter lies well below the escarpment on Dillybag Creek, in the
Deighton River drainage basin. It is a small shelter formed by a large iso­
lated block of sandstone and has two decorated zones. In addition there is a
large boulder just within the shelter overhang with engravings.

Pits are the most numerous of the peckings. They almost cover the entire
inward-facing side of the boulder, while a large concentration occurs on a more
or less horizontal shelf in the shelter wall. In both clusters most of the
pits are fully patinated and have a silica gloss. Several of them, however,
have been reworked at a more recent date, leaving a reddish, lightly patinated
surface which in several cases has not entirely replaced the silica veneer of
the older version.

In addition to pits, the boulder also contains a few short lines which lead
into pits; lines which meander over the upper ridge of the boulder and on to its
outward-facing surface; and tridents with a spur (Plate 10). One trident shows
much fresher working than the others and may be a more recent reworking of an
older pecking. Finally, one pair of macropod tracks, more lightly engraved than
the rest and with relatively little patina, is clearly superimposed on older pits.

On the actual shelter walls is a range of engravings of varying patinas and
depths, probably executed using different techniques. Where paintings overlap
with engravings, the paintings are always more recent.

High up on the wall facing the boulder is a row of five figures resembling
the Greek letter epsilon (ε) (Fig. 34), four of which face left, while that at
the left of the row faces right. Some of these are partly overlain by a painting
of a man with headdress and the right-facing ε is also overlain by a smoothly
abraded branched design. This is the only certain instance of rock abrasion in
the Laura region (Plate 11). Moving right along the rock face, we meet a group
of paired macropod tracks and bird tracks, moderately patinated and fairly lightly
pounded on the rock at about standing level, and beyond these, slightly lower on
the wall, is the shelf covered in fully patinated pits, referred to above.

On the smaller panel formed by the south-facing wall of the shelter,
engravings include macropod tracks and bird tracks of almost fresh appearance in
relief pounding, as well as very worn and fully patinated peckings of pits and
two rings.

Fig. 34  Pitted Rock Shelter: engravings resembling the Greek 'epsilon' (ε) overlain by an abraded
        design.
Plate 10  Pitted Rock Shelter: boulder covered with pits, tridents and meandering lines; note reworking of some of the patinated engravings.

Plate 11  Pitted Rock Shelter: abraded design superimposed on relief-pounded engraving.
THE QUIN KAN GALLERIES

This group of six shelters is very richly decorated with varied and spectacular painted friezes (Trezise 1971:36-56). Two of the shelters also contain relief-pounded engravings underneath the paintings.

Site B5 contains the more complex engraved designs (Trezise 1971:plate 10). The largest design is a rectilinear maze which incorporates tridents, a radiating form and roughly circular discs joined by relatively straight lines. Two small mazes incorporate some of these same elements. There are also isolated tridents and a pair of joined tridents. Many of the natural ridges of the shelter wall have been emphasised by battering.

Site B6 contains tridents, ten isolated discs and a horizontal silhouette of a woman, as well as an arc and some unidentifiable figures (Trezise 1971: plate 9).

Site B2 has three fairly fresh-looking engraved circles.

Another unrecorded shelter with a very few faded paintings contains two broad tridents (or bird tracks) and discs.

SPLIT ROCK GALLERIES
(Fig.35)

The largest of these shelters with its extensive frieze of paintings (Trezise 1971:69-77) has a few very worn and fully patinated peckings low down on the shelter wall. Some of them are so worn that they merge into weathered rock and it seems highly probable that the peckings still visible at this site are the remnants of an earlier much more extensive complex of pecked designs. The peckings consist of pits, tridents, tridents with spur and remnants of rectilinear mazes which incorporate pits and tridents.

One of the peckings is abraded and relatively fresh-looking, but this is a result of recent vandalism, for the site is easily accessible to tourists.

Fig. 35  Split Rock:  a and b, deeply worn engravings of maze designs and spurs;  c, a radiating form.
THE MOUNTED HORSE GALLERIES
(Plates 12, 13)

These are two shelters situated near the top of an isolated knoll in the Stone Axe Creek valley. The larger shelter contains mainly paintings and a few pecked or pounded tridents. The smaller shelter has faded remnants of paintings and several engravings at and near ground level. A group of fully patinated peckings comprises pits, a meandering line and a barred circle (Plate 12). A group of shallower and moderately patinated engravings, also fairly low on the rock wall, includes tridents and asymmetrical stars, as well as one fairly symmetrical star design (Plate 13). There is also a pair of macropod tracks.
THE POSSUM GALLERIES
(Plate 14)

Engravings have been found in only one very small shelter of this group. The engravings are situated on a rocky sill of the floor at the back of the shelter. They are shallow relief-pounded designs of a pair of macropod tracks, a trident with spur, a star and several pits.

Plate 14  Possum Galleries: relief pounded designs of tracks, a star and pits.

EMU GALLERY
(Trezise 1971:21-5 and AIAS Archives) (Fig.36)

The engravings in this gallery consist mainly of tridents, some with spur, one pair of joined tridents and one figure with three trident elements and additional lines, forming an elementary rectilinear maze. There are three small relief-pounded discs, one of which is flattened into an oval shape.

GINGER CREEK GALLERIES
(Trezise 1971:86-97 and AIAS Archives) (Fig.37)

Of six galleries published by Trezise only three are recorded as having engravings. Trezise's unpublished records in the AIAS archives (reproduced here as Fig.37) show drawings of engravings from Ginger Creek which do not match the published ones and presumably belong to one of the many unpublished galleries of this group. The engravings appear to be all in the same technique of relief pounding. The published designs comprise bird tracks, right-angled crosses, two human figures, one of which appears to have been speared (Trezise 1971:92), and two irregular linear designs and tridents. In addition there are pits and 'many faint petroglyphs under the paintings' (Trezise 1971:93), which have not been recorded.
Fig. 36 Emu Gallery: tridents and forms intermediate between linear tridents and shaped bird tracks (after Trezise)

Fig. 37 Ginger Creek Galleries: engravings of tridents and a linear design (after Trezise)
Fig. 38  Deighton River Shelter: curvilinear maze and radiating form with rings, tridents and a pair of macropod tracks (after Trezise)
The shelters of the upper Deighton River described by Trezise (1973:94ff) include one very large shelter 'more than a hundred feet wide' (p.104), which contains engravings on its steeply sloping rock floor. The engravings form a frieze approximately 4 m long and consist mainly of curvilinear designs (Fig. 38). On the left is a curvilinear maze and irregular patterns consisting of joined meandering lines and rounded enclosures. Near the centre is a radiating form of broad bands which Trezise describes as being more deeply pecked-out than the other engravings; some sinuous lines join the radiating form. The right-hand half of the frieze consists of one long and complex maze, mainly of curvilinear lines and rings; on its edges are an isolated ring, two tridents and a Y-shaped engraving. Trezise states that the engravings of this frieze are 'not very deep' and 'that the dark brown silica deposit had completely filled some parts' (p.105). On the far left of the frieze is a pair of engraved macropod tracks, which Trezise considers to be 'much more recent' (p.206).

**DISCUSSION OF THE LAURA ENGRAVINGS**

Most engraved sites contain relatively few engravings and these are often diverse as regards motif, technique and condition of patina, even within a single shelter. A few localities, however, have relatively large and homogeneous assemblages of engravings. These are the Early Man Main Shelter and Shelter H, the Deighton River Shelter, the Laura River Crossing and the Quinkan Shelters B5 and B6. From a consideration of the engravings at these sites, the distinction made by Woolston and Trezise between a non-figurative and a figurative complex of engravings seems to have some validity but to be an oversimplification of the data. At the Laura River Crossing figurative elements are closely associated with pits and a trident which do not differ from the figurative designs as regards technique, choice of location or condition of preservation. At the Quinkan Shelters, similarly, the only figurative engraving cannot be distinguished from the others on the basis of technique, location on the shelter wall or condition of preservation.

The chronological significance which Woolston and Trezise (1969:127) attach to their two categories of engravings is based on their evaluation of the respective patinas of engravings in the two groups. Their rigid chronological sequence can no longer be accepted, for it is clear from the site descriptions in this chapter that a large number of non-figurative engravings are not deeply patinated, while there is one instance of the superposition of a moderately patinated maze over deeply worn rings, St George Shelter B (Fig.27a). Furthermore, the reworking of pits and a trident at the Pitted Rock Shelter is indicative of the significance that was attached to these engravings a considerable time after their initial pecking (Plate 10).

A more detailed examination of the range of engraved motifs, with consideration of their patina conditions, their preferred locations and the few instances of superposition, is presented here. On the basis of these criteria a revised classification for the Laura engravings is proposed.

**The Early Man Complex**

It has been shown by excavation that the frieze of engravings at the Early Man Main Shelter originated before about 13,000 BP. The main elements of this frieze are pits, tridents and their variants, rectilinear mazes, rings around natural depressions and rounded enclosures with internal designs. Other characteristics of the frieze are its location on the shelter wall from ground level to standing level and a strong tendency for natural features of the rock to have influenced the location and/or form of the designs. There are other sites with engravings which share some of these characteristics and which on the grounds of patina are considered to have 'some antiquity'. These are the rectilinear mazes, tridents and pits of St George Shelter D (Fig.29), the single line joining natural hollows at Lonestar Creek (Fig.32), the very worn mazes, pits
and tridents, low on the wall, at Split Rock (Fig. 35) and the pits and tridents marking a boulder and ledge at the Pitted Rock Shelter (Plate 10). This last site also contains pecked rings which on grounds of patina and physical weathering may be considered broadly contemporary with the weathered pits. Although isolated rings do not occur in the Early Man frieze, there are circular pecked designs around the edges of natural depressions. Worn and pecked rings also occur at the St George Shelters B and G. At the Mounted Horse Shelter a worn ring encloses a series of parallel lines (Plate 12). Analogous to this design are the circular pecked depressions of the Early Man Main Shelter which enclose grid patterns consisting of two sets of parallel lines.

The pits at the Kennedy River site may also belong to this complex of engravings. Pits are admittedly too simple in form to be considered a likely diagnostic motif of any art complex, but their locations marking natural rock features (the detached boulder and rock ledges) are a characteristic of the Early Man Complex which is closely paralleled at the Pitted Rock Shelter. The high degree of patina also suggests a relatively great antiquity for the engravings at the Kennedy shelters.

Many of the peckings of the Emu Dreaming site conform to the range of motifs and traits described for the Early Man Complex, including peckings around the edges of a natural depression, lines or clusters of pits, a line with short transverse strokes and tridents. In addition, this site also contains symmetrical radiating forms, one of which merges into a maze with a trident (Fig. 30b). These figures are deeply patinated and cannot be separated from the other engravings on grounds of relative degree of preservation. Radiating forms must, therefore, be added to the motif range of the Early Man Complex. The engravings at the Deighton River shelter are similar to Early Man engravings as regards their location as a frieze beginning at ground level, their generally deeply patinated appearance and the inclusion of tridents and rings. It differs, however, in the significantly lower number of tridents than at other sites which have extensive engravings of the Early Man Complex and also in the configuration of the maze, which is largely curvilinear (Fig. 38). This site may represent a northerly variant of the Early Man Complex. The radiating form in the centre of the Deighton River frieze has an analogy in the Emu Dreaming site.

Although superpositions of differently patinated engravings are rare, there are three sites with extensive engravings of the Early Man Complex in which a fresh engraving of a pair of macropod tracks has been added: at the Early Man Main Shelter the fresh tracks are superimposed over the older engravings high on the wall in the right-hand section (Fig. 22c); at the Pitted Rock Shelter the fresh tracks overlie pits on the pitted boulder; and at the large Deighton River shelter the tracks are close to and among the older engravings on the extreme left of the frieze (Fig. 38).

In conclusion, it can be proposed that the engravings described above under the heading of Early Man Complex share a sufficiently consistent body of motifs and other traits to justify their classification together as belonging to a definable and 'early' art tradition, whose origins on the evidence of the excavated frieze dates to the late Pleistocene.

The engravings at Ginger Creek (Fig. 37) conform completely with the Early Man Complex as regards their motif range, but in the absence of information on their technique, patina condition and relation to natural features of the rock, their inclusion in the Early Man Complex cannot be substantiated.

Later Non-figurative Engravings

There remains a significant number of engravings of non-figurative motifs which differ from those described for the Early Man Complex either in motif or in degree of patina or both. They form a rather diverse group but share some motifs with the Early Man Complex. In none of this group is the influence of natural rock features on the engravings as discernible, unless the battered ridges are included as a category of rock engraving.

The engravings at the Quinkan Galleries B5 and B6 and the two smaller galleries of the Early Man group all contain designs of the Early Man Complex closely associated with other designs. At the Quinkan Galleries the rectilinear
mazes with tridents are linked to discs, not rings or enclosures. The patina conditions at these shelters appear less intense than in 'classic' Early Man-style engravings. Woolston and Trezise (1969:127) emphasise the highly sheltered nature of the rock walls at these sites and add that the engravings have been protected by layers of paint for some time. They conclude by including these engravings in their Early Phase. Arguments based on the subjective evaluation of superficial patina conditions are necessarily tentative, while those appealing to the protective qualities of paint necessitate an assumption that the paintings are also very ancient. A more serious objection to accepting their conclusions lies in the absence of discernible differences in the condition of the engraved human figure on the same rock wall.

On available evidence it seems more likely that the relatively well preserved conditions of the engravings in question, together with the modifications in the design of the mazes and their association with figurative elements, indicate a relatively more recent date for these engravings than for the Early Man Complex described above. The Collapsed Shelter and Shelter H at Early Man both comprise tridents and rectilinear patterns. Both also have curvilinear meandering lines and mazes. At Shelter H there are, in addition to these elements, figures which may be interpreted as modifications of the trident 'back-to-back' configuration (see p.62). Both shelters appear to be subject to very active weathering, which suggests that the engravings cannot be very ancient, although any evaluation of this would require much more precise analysis of the patina and micro-environmental conditions of the shelters than is available. There is, however, no evidence to suggest a particularly great antiquity for the engravings at these sites. Like the Quinkaen engravings, they seem to indicate a continuation of Early Man Complex motifs for a long period of time, with the addition of new elements.

In several of the St George Shelters engravings with fresh to moderately patinated appearance include both figurative motifs and tracks. At Shelter B the relatively fresh curvilinear maze is clearly more recent than the more patinated and worn motifs which it overlies (Fig.27a). In other shelters the technique and conditions of preservation of the curvilinear designs cannot be differentiated from macropod tracks (Shelter H) and a double star motif (Shelter I). Finally, the rare instances of engravings superimposed over paintings include three rings at Quinkaen Shelter B2 and a star at the Early Man Main Shelter (Plate 15).

Although it is not possible at this stage to define a consistent 'later' complex of non-figurative art, it is clear that the tradition of motifs from the Early Man Complex continued for a 'very long time', resulting in a significantly lesser degree of surface patina. It can also be shown that certain innovations of design were developed in these later engravings and that at some localities non-figurative engraving was broadly contemporary with, and perhaps meaningfully associated with, figurative engraving and painting.

The Laura River Complex

The engravings on the rock exposures in the Laura River bed may be considered as a homogeneous assemblage as regards location, technique, conditions of preservation and the very high proportion of figurative elements. Non-figurative motifs identified are pits and a trident; in addition one design (Fig.33f) is of so generalised a form that its superficial resemblance to a fish might be fortuitous. Other sites with figurative engravings are the horizontal outcrop at the Early Man Rock Platform, on which engravings of tracks have been partly superimposed by axe-grinding grooves; the small section of rocky floor at the Possum Gallery on which are tracks, pits and a star motif; and the isolated block from the Early Man excavation, which, for reasons discussed elsewhere (p.29), is considered to have been part of a horizontal outcrop. Engravings of figurative motifs, however, are also found on the vertical walls of rock shelters, ranging from relatively low to high on the wall. Engravings of humans or artifacts are known from only three shelters: Quinkaen B6, Ginger Creek and the boomerangs at St George Shelter C. Engravings of macropod and bird tracks are more widespread and occur at large numbers of shelters, generally with moderate to fresh patina. Some instances
of macropod tracks over paintings are known, for example at St George Shelter K.

Compared to paintings and non-figurative engravings, engravings of humans, artifacts and animals are very rare. Tracks are more widespread, but human footprints are known from two sites only: the horizontal outcrops of the Laura River crossing and the Early Man Rock Platform.

There is evidence from the Early Man excavation that this art form was practiced at around 5000 BP and, on the basis of tracks superimposed over paintings, it is probable that figurative engravings continued until 'the recent past'. In fact, there is no reason to propose any chronological separation between the figurative Laura River Complex and the Later Non-figurative Engravings, as was suggested by Woolston and Trezise (1969). It seems probable that they represent two facets of contemporary engraving activities.

**RELATIONSHIPS OF EARLY LAURA ENGRAVINGS**

The Pleistocene date for the engravings of the Early Man Complex inevitably raises the question of its relationship to other early art manifestations in Australia. Its non-figurative content and generally linear style are consistent
with engravings from many other sites throughout Australia which are generally considered to represent an archaic phase of Aboriginal rock art. The chronology and unity of these engravings has been discussed by Edwards (1971) who points out the stability of the major design elements and their respective proportions over wide regions of southern and central Australia. In particular, he considers the style to be characterised by tracks, mainly of emu and macropod but with some human footprints, and circles, which together make up some 80-90% of the motifs (Edwards 1971:362). Other motifs comprise pits, arcs, meandering lines and a range of regionally more restricted motifs which give some sites a distinctive character. Maynard (1979:95) argues for the inclusion of some of the Laura engravings in this group of early engravings for which she proposes the term 'Panaramitee Style'. Maynard based her assessment of the Laura engravings on the published account of Woolston and Trezise (1969).

The detailed re-examination of engravings in the Laura region, with the ensuing definition of the Early Man Complex of engravings proposed here, reveals some significant differences between this art tradition and the Panaramitee Style as defined for central and southern Australia. In Laura, circles not only occur in very low proportions but are frequently roughly circular enclosures rather than the relatively regular circles of other regions. Unambiguous representations of tracks are significantly absent from the Early Man Complex. Even if the inspirational origin of trident designs lies in emu tracks, their manipulation is significantly different from that of the Panaramitee Style, where tracks are frequently aligned as if to represent the progress of a bird (or animal). In any case macropod tracks and human footprints are conspicuously absent. The rectilinear mazes incorporating trident designs which characterise the Early Man Complex find an analogy in the Panaramitee Style only in very rare instances of mazes (such as at Panaramitee itself), which do not, however, incorporate track, or trident designs. The abundance of pits remains the only clearly shared motif between these two groups of ancient engravings. The similarities between Early Man Complex engravings and Panaramitee Style therefore appear very generalised: they share antiquity, technique and a few simple motifs, which are, however, not deployed in the same proportions; they differ markedly in their more complex motifs.

A recent survey for rock art in the Mt Isa region of northwest Queensland undertaken by Dr M. Morwood for the Department of Aboriginal and Islander Advancement (DAIA) has revealed a new and interesting body of rock engravings. Of interest in the context of this discussion is Morwood's discovery of patinated and ancient-looking engravings in a shelter in Carbine Creek (Morwood 1978: 11-13). These include an extensive maze, mostly of curvilinear design, which incorporates trident designs and circular motifs, as well as isolated tridents and rings. The structure of these designs compares closely with those of the Early Man Complex at Laura. Close by are barred circles which compare very closely with the one from the Mounted Horse Galleries in Laura. Other motifs from Carbine Creek suggest close similarities to Panaramitee Style engravings of central Australia. The intermediate geographical location of Mt Isa between southern Cape York and central Australia adds weight to the apparently intermediate nature of its engraved designs. Clearly any conclusions about the relationship between Early Man Complex engravings and archaic engravings in other regions of Australia are premature until the art of the Mt Isa region is more fully explored and understood. It would appear, however, that the great unity of style and motif of ancient art styles in Australia may have been overstated in attempts to synthesise the evidence for the antiquity of rock art on the continent.
APPENDIX

THE IDENTIFICATION OF 'RESINS' FROM THE EARLY MAN EXCAVATION

A. Rosenfeld

The small concretions of brittle reddish material found in the excavation (p.29) in levels estimated to be of the order of ca. 2000 and ca. 4000 years old respectively have a superficial resemblance to resins locally obtainable from *Xanthorrhoea* but also from a number of other trees. A fragment of apparently similar material occurred among a surface collection of organic material found in a shelter within a few kilometres of Early Man, known as Dillybag Shelter. In addition, Dillybag Shelter yielded a round ball of light-weight brownish-black material about the size of a billiard ball which, it was thought, could be a store of prepared resin. Apart from one burr en adze on which the distribution of black concretion is clearly compatible with its interpretation as the cement used to fasten the blade to its haft (see p.15), a number of other artifacts had small concretions of apparently similar material, but its identification remained problematical.

Eight samples of material believed to be 'resin' or 'gum' from Early Man and Dillybag Shelters were submitted for analysis to Professor B. Reynolds and Dr B.F. Bowden of James Cook University who are currently engaged on a research project into the analysis and identification of cements used in Aboriginal technology. Dr Bowden, of the Chemistry Department, kindly agreed to examine these archaeological samples, despite the special problems presented by their relative antiquity and the very small size of some. The following information has been supplied by him and is reproduced here with his permission.

The method we have been investigating is examination by gas liquid chromatography (glc) to obtain a 'series of peaks' which may be used as a fingerprint for a particular resin. To run the actual glc requires microscopic (i.e. µg) quantities.

To obtain the glc traces, a sample of the resin was placed in a capillary tube and heated to approximately 320°C; the volatile material which boiled out was dissolved in ethyl acetate and injected into the glc. Glc conditions used were:

1. 3% SE30 column, 1 m long x 2 mm internal diameter;
2. temperature programmed from 50°C to 200°C at a rate of 10°C per minute;
3. chart speed = 0.5 cm/min.

For comparison with the archaeological samples, glc traces of the resins from three plant species with distinguishable resin 'traces' were used (Fig.39a-c), *Grevillea parviflora* (fine-leaved beefwood), *Callitris columellaris* and *Xanthorrhoea johnsonii*. Of the eight archaeological samples submitted for analysis, only two yielded sufficient volatile component for glc analysis; these are the red brittle material from Dillybag Shelter (Fig.40) and the similar material from Level 3 at Early Man (Fig.41). Both yield glc traces closely comparable with that from *Xanthorrhoea* (Fig.39c).

Dr Bowen adds:

To explain the glc traces, the peak on the far left hand side of each trace is the solvent. The greater the distance between this
Fig. 39 Glc traces of modern resins: a, *Grevillea parallela*; b, *Calitris columellaris*; c, *Xanthorrhoea johnsonii*.

Fig. 40 Glc trace of a sample from Dillybag Shelter.

Fig 41 Glc trace of a sample from the Early Man Shelter
solvent peak and other peaks, the less volatile the component is, i.e. the peak about 2.3 cm from the solvent (in *Xanthorrhoea* samples) represents the most volatile component in the mixture, so it is hardly surprising that the amount of this component in the mixture has decreased with age. Also, the size of the peaks on different traces does not quantitatively represent the amount of those components in the resin since:

1. the quantities of resins used in different traces differ;
2. the amount of volatile material obtained varied with different samples, so the amount of solvent used to dissolve the volatile material was varied to give the major component as a reasonable sized peak on the trace.

In reality, the amount of volatile material from sample 7 (Level 3, estimated age 2000 years) was much less than from a comparable amount of sample 2 (surface in Dillybag Shelter, estimated age ca. 50-100 years), which in turn was less than is normal from a fresh resin sample. We have not, however, quantified this decrease in volatile material with age.

Of the six other samples submitted, two were too small for analysis, and the large brown ball of 'resin' from Dillybag Shelter was shown to contain no resin. It appears to be entirely beeswax. Three samples of dark concretions adhering to stone artifacts, including the one identified as resin on grounds of its distribution over the artifact, were identified as probably organic since they can be made to burn, but they could not be made to dissolve in organic solvents and yielded 'no viable quantity of volatile material on heating, so the glc traces could not be obtained'.

In conclusion, therefore, these analyses seem to confirm the collection of *Xanthorrhoea* resins by Aboriginal people, since fragments of this resin occur in association with other archaeological debris. The identification of the resins used for hafting stone artifacts unfortunately remains inconclusive. An explanation for the lack of volatile components in this utilised 'cement' may lie, in part at least, in the loss of volatile material during the heating required for processing and hafting, thus leaving an already impoverished material on the stone object as compared to the natural plant exudate. The positive results obtained with untreated material of 2000 years old suggest that resins are comparatively stable materials under the sandy conditions of some rock shelters and that further research into the surviving components of these resins may prove valuable.
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