ABORIGINAL SITE SELECTION AT ONE OUTLIER ON LAWN HILL STATION, N.W. QUEENSLAND

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AIMS

Humans organise the space around them according to consistent, and often tacit, rules. Not only do people regulate their "personal space", but it also appears that there is spatial patterning within and between structures in settlements (eg. Clemens 1979; Fletcher 1977; Hall 1959, 1966; Negerevich 1977). The form and size of structures is also strongly patterned, perhaps according to changing physical and social environmental conditions (eg.Rapoport 1969; and various papers in Rapoport 1976). Most studies of spatial behaviour have been concerned with settlement layout in ethnographic and historical contexts. However, if people organise artificial structures in accordance with these "spatial rules" today and in the recent past, it is suspected that they might also be selective in their use of natural shelter such as caves and overhangs. Furthermore, it should be possible to establish, using archaeological data, whether or not these patterns of spatial use operated in prehistoric societies. With this possibility in mind I examined an outlier containing overhangs on the Carpentarian plain of Northwest Queensland. This paper presents preliminary results of that investigation.

LAWN HILL OUTLIER

The Lawn Hill region is both tropical and semi-arid. Steep-sided mesas of limestone, and lower rounded hills of sandstones, greywackes, and quartzites, protrude from a Quaternary flood plain. Most outlying hills are covered by spinifex whereas the plains are dominated by Mitchell grass. Eucalypt woods occur near seasonal stream channels. The 60m high mesa which was examined lies about four kilometres south of the Lawn Hill Homestead (Lat.138°33'E; Long. 18°36'S; Figure 1).

There are distinct differences between the western and eastern halves of this outlier. The western portion is described as Thorntonia Limestone and the eastern portion as the Border Waterhole Formation (De Keyser 1969, De Keyser and Cook 1972:9,22, Sweet and Hutton 1982:24). The two facies grade laterally into each other, often quite abruptly.

Thus, the eastern part consists of small rounded chert nodules in a friable breccia, whereas the western areas of the mesa are typical of hard, weather-resistant dolomite found further to the south. As a result of these differences the eastern area has a 20-40m high scree slope, topped by a cliff line. Large numbers of small caves and overhangs resulting from cavernous weathering occur at the junction of the cliffs and the scree slope. In contrast, the western side of the outlier exhibits few scree slopes and no large overhangs; instead, the cliffs plunge uninterupted to the flood plain.

All overhangs examined at this outlier have the same access to resources. Permanent water lies 3-4 km to the west. A seasonal channel occurs 1 km to the south. All sites lie about 2 km from the nearest stone quarry (greywacke), and all have identical relationships to vegetation zones. Thus, differential access to resources is <u>not</u> a useful explanation as to why some shelters were occupied and others were not. An alternative explanation is that intrinsic properties of the shelters themselves were the criteria for Aboriginal site selection. To test this proposition I took a series of measurements as outlined below.

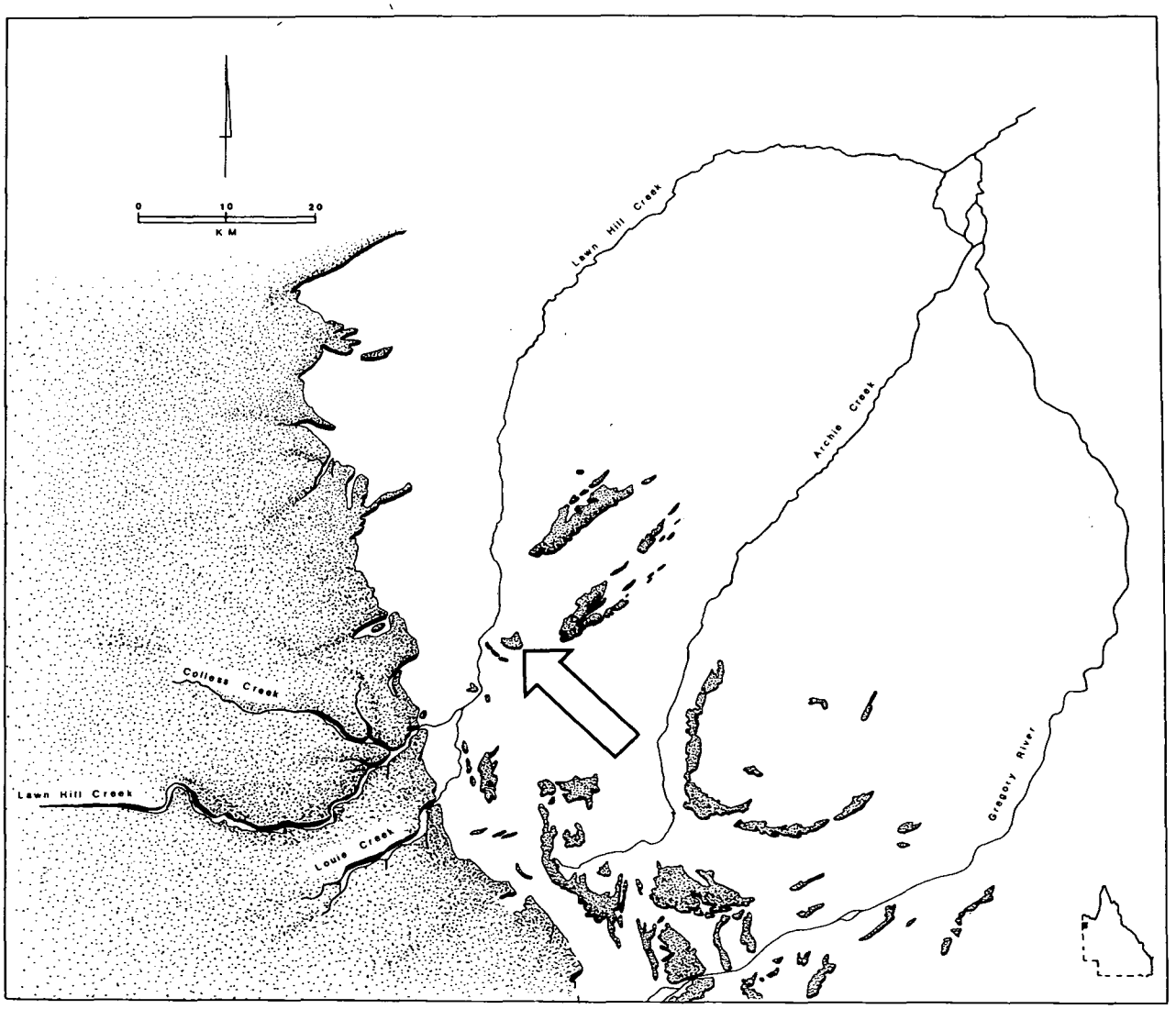

Figure 1. Map of Lawn Hill showing location of outlier.

MEASUREMENTS

Three kilometres of cliff line were examined at the southern edge of the outlier. I recorded all overhangs/caves with a floor area greater than $4m^2$. These were designated "PH" locations, implying that they were "potentially habitable" (cf. Attenbrow 1982:72). PH locations were numbered and particular characteristics recorded for each. Figure 2 illustrates how these characteristics were measured. Measurements taken were as follows:

Length was measured as the straight line distance from one side of the shelter entrance to the other, immediately inside and parallel to the drip line. Length was measured to the nearest 10cm.

Width was recorded at 90^{o} to the longitudinal axis from the drip line to the point where the floor and wall of the shelter met and was made at the widest part of the shelter. It was taken to the nearest 10cm.

Ceiling Height was the average height of the ceiling above the floor. It was measured to the nearest 10cm.

Aspect is the direction in which the PH location faces and was recorded as compass bearings included by the arc of visibility when standing at the point where width and length measurements intersected. Compass bearings were taken to the nearest 5^{o}.

Range of visibility was recorded as the size of the aspect arc, i.e. the number of degrees which were visible from the point where aspect had been recorded.

Floor type is the composition of the floor surface, and was recorded as one of three possibilities: gravel covered, bedrock, or a combination of bedrock and gravel.

Average artefact density was estimated after surface artefacts had been counted in several square metres.

Minimum artefact density was recorded by locating the area which appeared to contain the least number of artefacts. A one metre square was then laid out at this point and the number of artefacts visible on the surface was recorded.

Maximum artefact density refered to the area which appeared to contain the greatest concentration of artefacts. Again, a one metre square was laid out at this point and the number of artefacts visible on the surface was recorded.

Amount of faunal remains was estimated by noting all bone or shell on the shelter floor. Information recorded included the number of fragments per square metre, fragment size, fragment type, and species represented.

In the following analysis the presence of artefacts is taken to indicate that some prehistoric Aboriginal activity took place in the shelter. This activity could be as minimal as dropping artefacts or as complex as long term living (ie. "base-camp" activities). It will not be

possible to define precisely what behaviour occurred at the shelters until a detailed analysis of the artefacts is made. The terms "inhabited", "occupy", and "Aboriginal use" all refer to undefined activities visible through the discarding of artefacts. As I am dealing only with the presence or absence of activities in each shelter this minimal inference should be sufficient for this present study.

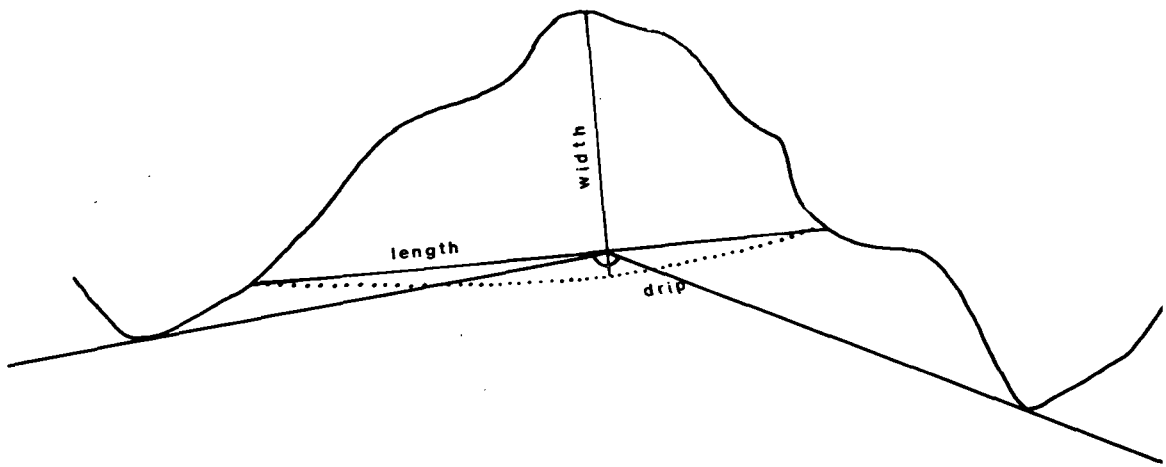

Figure 2. Idealized PH shelter showing measuring points.

RESULTS

Twenty-one PH locations were recorded (see Table 1). All were situated on the eastern half of the outlier. Only six contained visible artefact scatters and were therefore considered inhabited. Thus, the question arises: in what ways are occupied shelters different from unoccupied shelters?

Figure 3(a,b,c) summarises the widths, lengths and heights of the shelters. A consistent pattern occurs with regard to these variables which may be summarised as follows:

1. The larger shelters are those which contain artefacts.

2. The largest classes of length and width consist entirely of shelters with artefacts. Conversely, with respect to all three variables, the smallest shelters contain no artefacts.

3. The mode of length and width variables for PH locations with artefacts is higher than the mode for those without artefacts.

Size differences are more clearly expressed by calculating the floor area and shelter volume. Figure 4(a) plots the length of each shelter against its width. There is a clear difference in floor areas between PH locations with and without artefacts. Artefacts were found only in the six largest shelters. Shelters with floor areas of 14 square metres or less contained no artefacts.

Volume is roughly illustrated in Figure 4(b) which plots the average ceiling height against the maximum floor area. The result is an exaggeration of the pattern revealed in Figure 4(a). Shelters with volumes less than 30-45 cubic metres show no evidence of occupation.

Thus, it appears that Aboriginal use of space at this outlier involved a selection which clearly favoured large shelters. This initial conclusion is reinforced by the relationship between the size of the shelter and the surface density of artefacts. There is a positive correlation of 0.8 between floor area and average artefact density (Figure 5(a)). Volume correlates even more closely with average artefact density, giving a coefficient of 0.86 (Figure 5(b)).

Could other explanations be given for the occurrence of artefacts in some shelters and not others? Figure 6 gives aspects of shelters with and without artefacts. PH locations with artefacts have a greater tendency to face south (135-225°) than shelters without artefacts. Some PH locations without artefacts face NW (270-360°), though no shelters with artefacts face that direction. Conversely, one occupied shelter faces NE, whereas no PH locations without artefacts face in that direction. There are, therefore, some differences in the aspects of shelters with and without occupation. But it would appear that if aspect has some effect on site selection it works only within the size limits defined above. If aspect was the sole criterion for site selection, shelter size would have no effect on the amount of occupation. It has already been shown, however, that shelter size alone could adequately account for the selection of sites. Thus aspect may at best have been a secondary factor in site selection. This notion cannot be tested until large shelters facing northward have been found and measured.

The range of visibility from each PH location is presented in Figure 7. Shelters with artefacts all have ranges of vision between 90° and 180°. This is a more restricted distribution than the population of shelters without artefacts. However, these differences may be due simply to a relationship between shelter size or shape and the amount of visibility.

The final possibility I will consider is that the relative abundance of artefacts in each PH location is affected by the type of floor in the shelter. Table 2 shows the relationship between floor type and presence of artefacts. The six shelters with artefacts had gravel floors, or a mixture of gravel and rock, but none had a totally rock floor. I will consider three possible explanations of this pattern.

1. <u>The pattern simply indicates that rock floors were generally uncommon</u>. The evidence in favour of this is that only 14% of all the PH locations measured had bare rock floors, or one in every seven shelters. As only six shelters with artefacts were found, it is likely that a rock floor might not appear in that sample. This hypothesis can only be tested by increasing the sample size.

2. The pattern reflects erosional regimes. It could be argued that shelters with bare rock floors have had cultural deposits removed by water. If this were the case, however, artefacts should be found on the scree slope in front of those shelters. They were not. Furthermore, this argument cannot explain the absence of artefacts in smaller shelters with gravel floors.

3. The pattern reflects Aboriginal preferences for gravel rather than rock floors. Although this may well be true, it cannot be tested without finding large southerly facing shelters which have rock floors but no artefacts. Unless such instances can be recorded for this outlier or others nearby, I consider it more likely that size, and perhaps aspect, are the criteria for site selection.

Although these three explanations cannot be tested without further data, I consider it is likely that floor type had little influence in Aboriginal shelter selection at the Lawn Hill outlier. Further, it is unlikely that the observed pattern can be adequately explained by reference to non-human agencies.

CONCLUSIONS

Preliminary results indicate that for this outlier on Lawn Hill Station, shelters containing artefacts differ in a number of ways from shelters which have no visible evidence of human occupation. It is especially clear that inhabited shelters are distinctly larger in size. It will be necessary to gather more data in order to ascertain whether or not aspect and floor type were critical variables for selection of overhangs by Aborigines in the past.

Further research which I hope to carry out will explore these preliminary aspects of spatial behaviour in the Lawn Hill region. It will proceed as follows:

a) Fieldwork will be undertaken in the same outlier in order to gain a larger sample of PH (Potentially Habitable) locations. This may help to determine whether size is the sole criterion in shelter selection, or whether it is merely the dominant factor.

b) Fieldwork will also be pursued in other outliers on the Carpentarian plain and in the uplands to the south. This work may help to define differences and/or similarities between overhang selection in a variety of areas within the Lawn Hill region.

c) Analysis will be carried out on artefacts both inside and outside caves and overhangs in the region. This should help determine if activities inside and immediately outside shelters were different. To this end three caves/overhangs in the region have already been excavated.

ACKNOWLEDGEMENTS

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Table 1. Measurements taken on PH shelters

Overhang number	Site name	Density	Length	Width	Height	Floor	Aspect
1	-	-	6.5 m	2.2 m	2.3 m	Bare rock	190-360
2	-	-	2.0 m	2.5 m	2.3 m	Gravel	185-340
3	-	-	2.5 m	1.5 m	2.0 m	Gravel	200-340
4	-	-	3.1 m	3.4 m	1.8 m	Rock	200-300
5	-	-	3.2 m	1.4 m	3.2 m	Rock	190-310
6	-	-	4.0 m	1.3 m	2.9 m	Rock	170-360
7	-	-	5.6 m	1.6 m	2.5 m	Rock & Gravel	170-300
8	-	-	4.0 m	1.5 m	3.4 m	Rock & Gravel	130-260
9	-	-	3.3 m	2.2 m	2.5 m	Gravel	120-240
10	-	-	3.8 m	1.3 m	1.3 m	Rock & Gravel	90-260
11	-	-	4.9 m	2.4 m	4.0 m	Gravel	210-310
12	LH K44/2	av.=0.5/sq.m min=0.2/sq.m max=2.0/sq.m	7.5 m*	3.9 m	2.8 m	Gravel	110-260
13	-	-	3.2 m	0.8 m	2.4 m	Rock & Gravel	130-250
14	-	av.=0.07/sqm min=0.01/sqm ##max=1.0/sq.m	8.5 m	3.8 m	3.3 m	Rock & Gravel	90-220
15	LH K44/4	av.=3-4/sq.m min=2.0/sq.m max=8.0/sq.m	17.4 m	3.7 m	2.3 m	Gravel	100-270
16	-	-	4.3 m	3.2 m	1.4 m	Gravel	120-260
17	LH K44/3	av.=2.0/sq.m min=1.0/sq.m max=3.0/sq.m	8.4 m	2.9 m	3.0 m	Gravel	140-260
18	LH K44/5	av.=3-4/sq.m min=1.0/sq.m max=6.0/sq.m	11.5 m	3.2 m	4.8 m	Rock & Gravel	140-240
19	-	-	1.4 m	3.7 m	2.5 m	Rock & Gravel	#170-215 260-280
20	-	-	3.0 m	1.4 m	2.6 m	Rock	110-280
LH53	LH53	av.=5.0/sq.m min=3.0/sq.m max=9.0/sq.m	12.0 m	6.8 m	2.9 m	Rock & Gravel	140-300

* This was the main area of the overhang. There was an additional area of 7.0 m (length) x 0.7 m (width) that could be included.

In addition to stone artefacts two fragments of mussel shell were found.

\# This was a small cave with two openings.

Table 2. Relationship of floor type to PH shelters

	GRAVEL	GRAVEL & ROCK	ROCK
With Artefacts	3	3	0
Without Artefacts	7	5	3

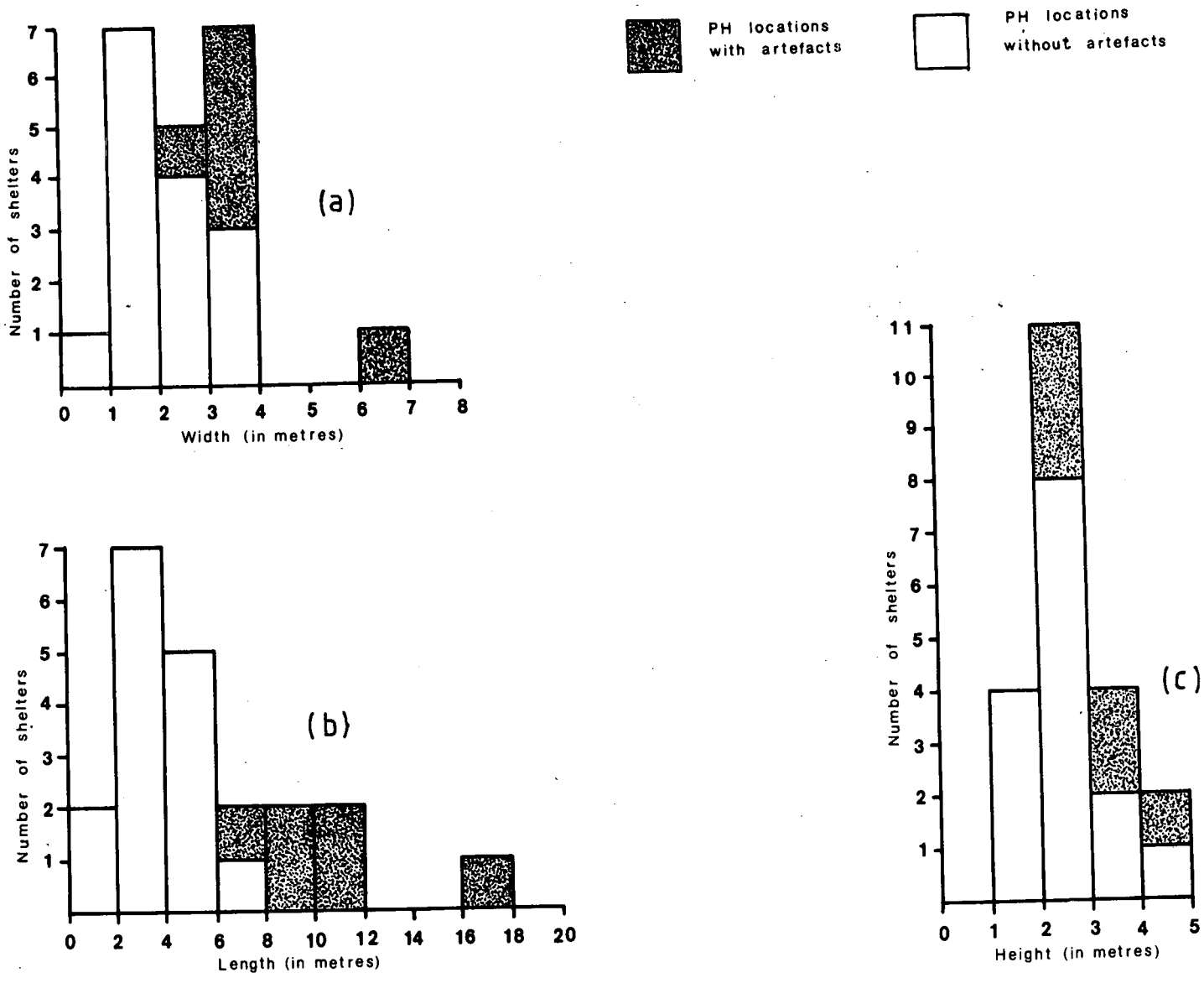


Figure 3. Histograms showing the widths (a), lengths (b) and heights (c) of PH shelters with and without artefacts.

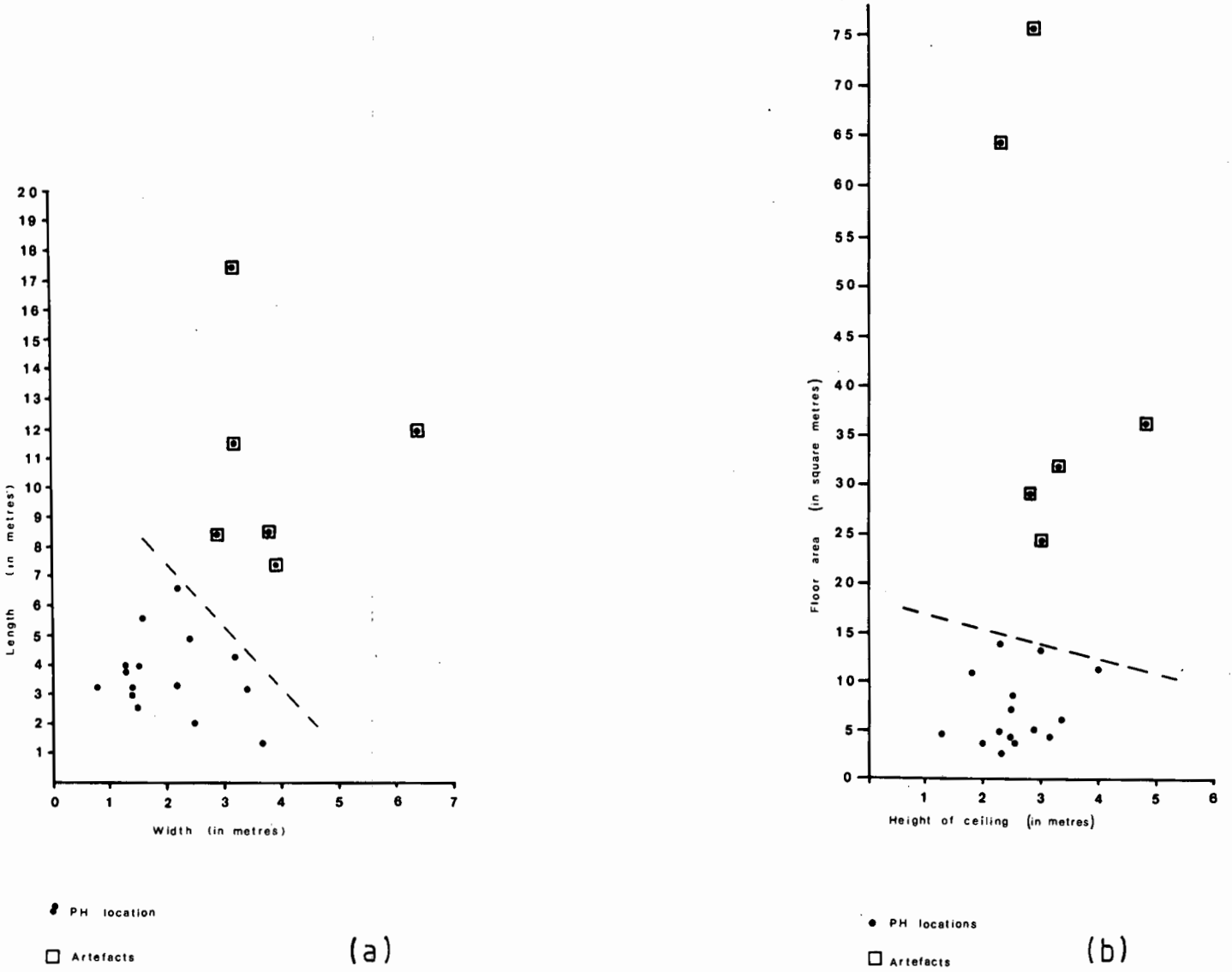
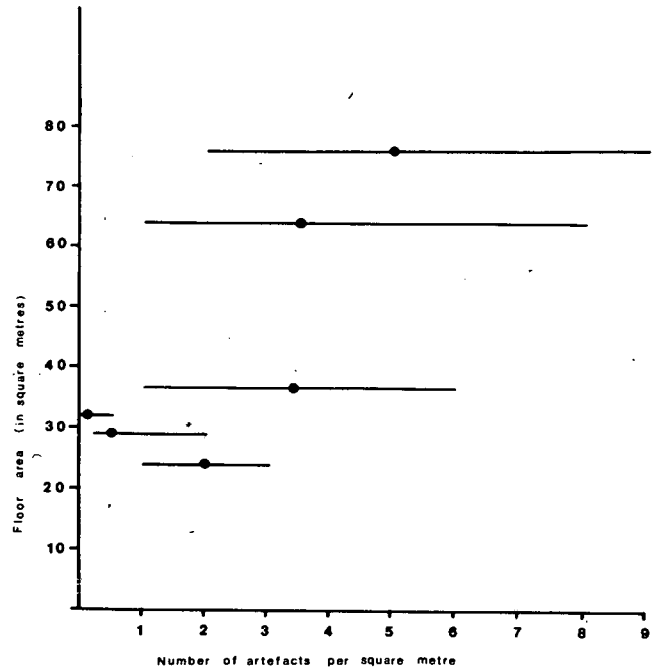
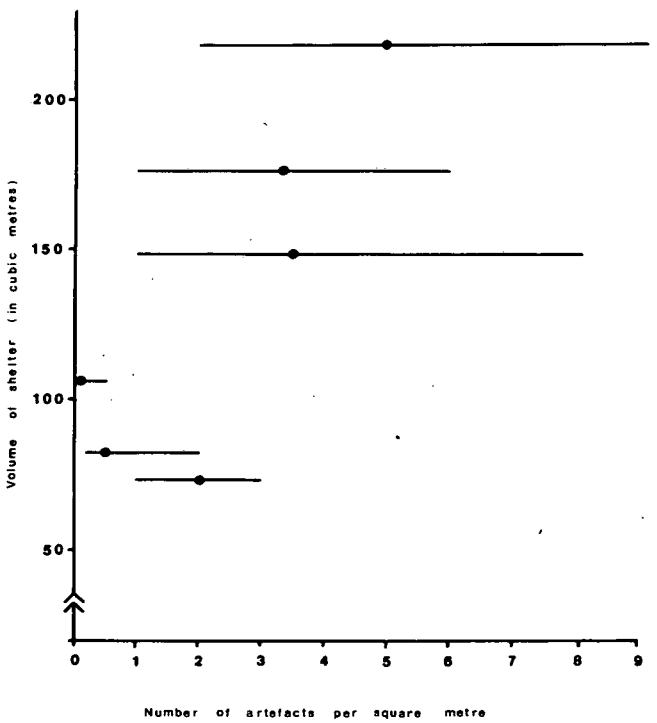


Figure 4. Plot of the relationships between length and width (a) and between floor area and ceiling height (b) for PH shelters



(a)



(b)

Figure 5. Plot of the relationships between floor area (a) and shelter volume (b) and average artefact density for PH shelters with and without artefacts. Also shows artefact densities in each shelter.

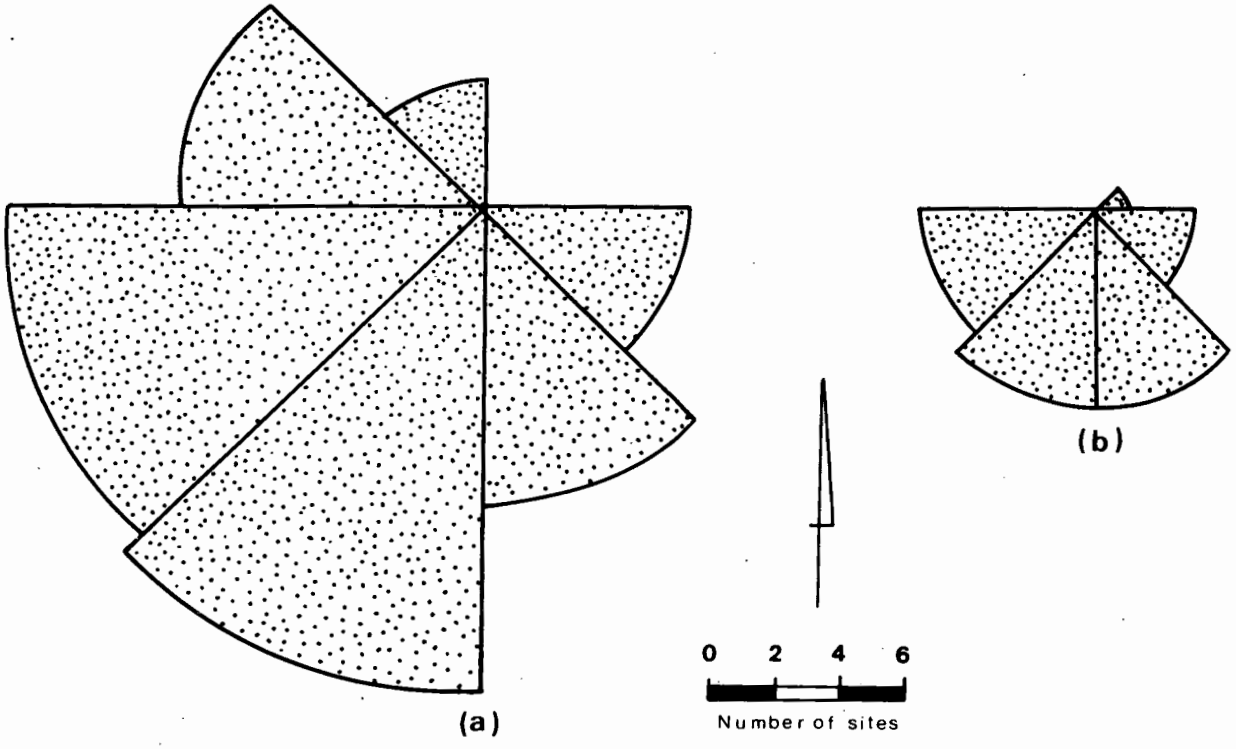


Figure 6. Illustration of the aspect of PH shelters without (a) and with (b) artefacts.

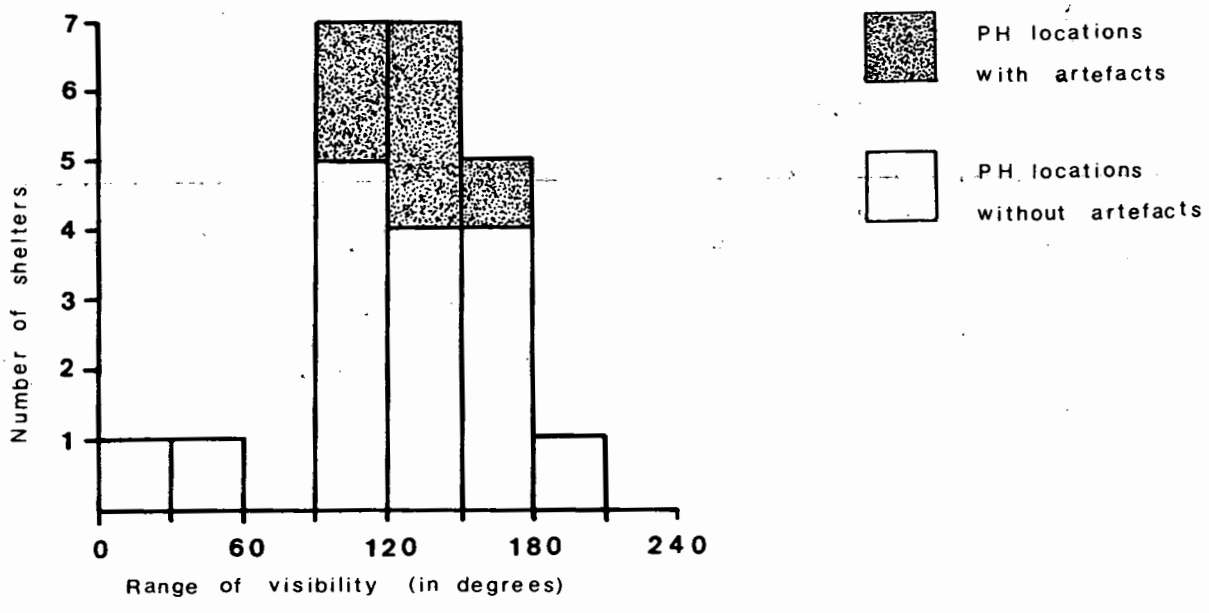


Figure 7. Histogram showing visibility range of PH shelters with and without artefacts.