NOTICE OF GENERAL MEETING

The sixth general meeting of the Society for 1978 will be held in the Museum Education Building, North Terrace, Adelaide, at

8.00PM MONDAY 28 AUGUST 1978

AGENDA

1. Apologies.

2. Minutes of General Meeting held on Monday 24th July 1978 to be confirmed. Copies of these minutes are attached.

3. New Member.
   The following new member has been elected to the Society.
   
   Mr. Richard Lippett.

   Papers and Journals from other Societies and Organizations will be tabled at the next meeting, including the following:

   Conservation Council Newsletter Vol. 6 No. 2.
   Anthropological Society of Victoria, Newsletter No. 139.
   Royal Society of S.A. Notice Paper.
   The Artifact Vol. 3 No. 2.

5. Business.

6. Speaker.
   MR. LEON SATTERTHWAIT, Curator of Anthropology of S.A., Museum and a member of this Society will give an address entitled.

   'The Peoples of South Western Alaska'

7. Supper.
   Coffee and tea with biscuits.

VERN TOLCHER,
Honorary Secretary,
213 Greenhill Road,
EASTWOOD, S.A. 5063.
THE ARCOONA PLATEAU - AN OUTLINE OF ABORIGINAL HABITATS AND RELICS.

by MR. RON HEWITT

North west of Port Augusta in South Australia and centred roughly on the town of Woomera, is an area known as the Arcoona Plateau. A combination of environmental factors and a plethora of aboriginal relics renders the area rather unique in Australia. This paper is intended to describe briefly the habitat and then outline in a general way, the evidence of aboriginal activity.

The Arcoona Plateau is roughly triangular in shape with the base along the west side of Lake Torrens and the apex near Lake Henson in the west. It comprises part of the Stuart Stable Shelf (Sprigg 1952:153-9), an undisturbed formation of late Proterozoic deposits. It tilts very gently from Uro Bluff (277m) in the southeast, downwards to the northwest where it disappears under Quaternary sands and Cretaceous sediments at about 130 metres (Fig. 1). The exposed surface of the plateau is bounded by the steep escarpments of Lake Torrens in the east and Lake Hart and Island Lagoon in the southwest. The more southerly portion is bounded by the Bookaloo lowlands of sand and scrub with large embayments formed by large salty playas such as Lake Windabout and Pernatty Lagoon. The northern end and northwestern margins are generally flat and tilt very gently beneath the sandy scrub country that extends far to the northwest.

The composition of the plateau is that of undisturbed strata of sandstones, quartzites, shales, clays and grits with the uppermost strata being a very hard rock known as the Arcoona Quartzite member (Johns 1968:31). This caprock has been exposed in many parts of the region and is an important factor in the geomorphology of the plateau generally. The surface of the plateau is covered with a deep red clay soil that becomes impassable to vehicular traffic after only moderate falls of rain.

Over a long period of time this very vulnerable soil has been protected by a surface cover of small gibbers and strong growths of saltbush and other arid area plants. The surface is mostly treeless and over much of the plateau, the horizon is presented as a flat treeless line for the full circle. However, the flat horizon is deceptive, as watercourses exist having their source in the canegraz swamps on the level plateau surface. From the canegraz swamps, the streams progress until they are distinct watercourses meandering from claypan to claypan through a shallow valley or vale. The bed then deepens till they are eventually entrenched in a rocky gorge that then opens out onto sandy flats across which the stream flows to the lakes. The gorge sections of the streams often contain a number of fresh waterholes that can be up to 70 or 80 metres long, 8 or 10 metres wide and perhaps 3 metres deep when filled. Soak water can occur in odd places along the stream, but mostly where it crosses the sandy flats to the lake. Thus, where water supplies are usually located in the upper reaches of streams in other parts of inland Australia, those of the Arcoona Plateau occur in the lower and lower middle reaches. These watercourses are essentially the result of the forces of arid area erosion such as deflation and spasmodic heavy rain.

The larger lakes and salty playas such as Island Lagoon, Pernatty Lagoon and Lakes Hart, Hanson, Windabout and Torrens have a low ratio of catchment area to lake surface area and seldom carry more than a mere skim of brine. They constitute, particularly when wet, a natural barrier along much of the southwestern and eastern margins of the plateau. However, it is not suggested
Fig 1 - Arcoona Plateau.

- Saltbush and gibber plateau (Arcoona Plateau)
- Plateau overlaid with sand and scrub
- Lowlands of sand and scrub
they comprise an impassable barrier at all times.

The smaller lakes are mostly freshwater lakes and are situated in the central and towards the northwestern section of the plateau. They comprise Lakes Campbell, Koolymilka, Richardson, Arcoona and Shell Lagoon and have relatively high ratios of catchment area to lake surface area, so that as a result of sporadic heavy rains they can carry up to seven metres of fresh water, (personal communication - J. Oag). As stated earlier, the shallow and indistinct drainage of the plateau surface often feeds into cane grass swamps some of which have no outlet, such as Fred's Camp Swamp near Woomera, which is a particularly large swamp and is in fact another fresh water lake in the embryo stage.

Night temperatures seldom fall to 0 degrees Centigrade even in winter and day temperatures are usually above 30 degrees for about six months of the year. The annual rainfall is about 150mm (6 inches) and can often be much less; the evaporation rate is around 2500mm (100 inches) per year. (Johns 1968:16-17). Under recent climatic conditions the lakes and swamps are dry or nearly dry most of the time and may remain so for a decade or two, only filling when torrential falls of 120mm (5 inches) or more occur. This latter situation tends to occur only on the rare occasions (under recent climatic conditions) when monsoonal and other non-cyclonic conditions penetrate to this part of the continent and result in annual rainfalls that may reach 400 to 500 mm (20 inches). General filling of the fresh lakes occurred around 1921-22 then again around 1947-49 (mostly dry again by 1952) and then again in 1967-68. Most lakes had barely dried out by the early 1970's when an unprecedented wet spell filled the lakes again and kept water in them almost to the present day, May 1978. (See Fig. 4). However, an individual torrential fall of only 50 mm (2 inches) is sufficient to run the creeks and fill the waterholes, claypans, smaller swamps and perhaps put a little water into the fresh lakes; but spread as steady rain over several days, the same fall would barely put a trickle in the creeks. Thus it can be seen that above average rainfalls will not necessarily contribute to the water storages unless they embody heavy individual falls, and as a result the water resources of the area are extremely sporadic in timing and variable in quantity.

The smaller lakes and the watercourses are prime factors in the distribution of aboriginal activity and it is pertinent to give a more detailed description of them and their immediate environs. All the fresh lakes have a floor level well below the plateau generally and on an average are about 60 metres below. They all tend to have their southern and western sides rimmed with steep escarpments to the gibber plateau. In contrast, their northeastern margins are comprised of sandy flats extending for a few hundred metres then rising gradually to an extensive sandridge having it's crest higher than the surrounding plateau - Lyne Ridge, Campbell Rise, Yandandarre Ridge and Corroborricarrrie Hill are examples. Beyond the main ridges there is usually a system of sandy areas and longitudinal dunes extending in some cases for many kilometres, even to another lake (Fig. 2). The source of the sand is in the deflation of the dry lake beds by the prevailing strong winds which are southwesterly.

Similar sandy areas of much smaller extent occur along the downwind side of the more shallow sections of large watercourses, where the prevailing strong winds remove sand from claypans and flats over which the stream meanders. Examples of this occur along many kilometres of Mungappie Creek, Yandandarre Creek, Rocky Creek and the Wirrawirralu Creek all of which flow into the fresh water lakes (Fig. 2). Larger streams such as the Elizabeth and Pernatty Creeks which flow into the salt playa of Pernatty Lagoon produce
even more extensive sandy tracts within their valleys.

In figure 2, it will be seen that the sandy areas originating in the lake basins and along the larger watercourses form a network of lightly timbered sand and claypan tracts linking many parts of the plateau. Nevertheless, the major portion of the plateau is composed of large unbroken tracts of saltbush and gibber plain devoid of all water except for short periods following heavy rains. These areas would present a natural barrier to aboriginal activities as would the large playas to the southwest and east.

The lowlands to the south of the plateau and the lands to the northwest are all sand and scrub covered with small and weak watercourses having a few good waterholes. Claypans and caneground swamps do occur fairly generally and longitudinal dunes of low profile running southwest to northeast are common. The bordering lands to the north are similar to these just described, but with a fossil dune system running north and south underlying the more recent southwest to northeast system. As a result of this interlacing dune system, extensive claypans are prevalent whilst watercourses are virtually nonexistent.

The plateau, encompassing it's saltbush gibber plains and sandy scrub areas of the valleys and lake basins, has a distinct dual flora system determined by the nature of the soil - the red clay of the gibber plains and the sandy soils of the river flats, dunes and lake basins.

The stoney gibber areas are almost devoid of trees and large bushes except for some of the rocky gullies and watercourses where the black oak (casuarina cristata), the paperbark (melaleuca pauperiflora) and the bullock bush (heterodendrum oleaefolium) occur in variable stands. Other mostly smaller shrubs such as the hakea, cassia, eremophila, acacia and santonum species can also occur in the gullies. The vegetation of the gibber table-land proper is dominated by the bladder saltbush (stripesx vesicaria) and the canegrow (eragrostis australasica). The saltbush is associated with numerous other arid area plants, the principal species being stripesx, kochia and bassia. The canegrow grows densely in 'swamp' areas and can form an almost impenetrable thicket up to two metres high as in parts of Fred's Camp Swamp. In years of heavy rainfall, the plant growth is prolific with a number of plants such as swainsona stipularis, not seen in a decade or more, suddenly appearing in tracts covering whole hillsides. After prolonged dry spells however, much of the ground cover dies off and blows away exposing large expanses of gibber covered ground. But even in these dry years, sufficient dry feed and succulents remain to provide sustenance to a limited fauna population including in historical times, the pastoralists sheep. An important dry feed and favourite food of the red kangaroo, neverfail grass (eragrostis setifolia), is plentiful in the numerous gilgai depressions on the plateau.

In contrast to the gibber areas, the sandy areas are mostly lightly timbered with mulga (acacia aneura) and myall (acacia sowdenii) where the soil is a sandy loam as on the southern, western and northwestern margins. Within the sandflat and dune areas associated with the lake basins and watercourses of the plateau proper, mulga and black oak predominate in some localities while dense stands of native pine (callitris glauca) occur in other localities such as "The Pines" homestead area and east of Pernatty Lagoon. The use of the pine for fencing and other pastoral activities has heavily reduced other stands of this tree in historical times. It is of particular interest that eucalypts of any kind do not exist in the plateau area except along the banks of the Pernatty, Elizabeth, Yeltacowie and Wittata Creeks all of which empty into Pernatty Lagoon. Some fine stands of red gum (eucalyпус camaldulensis) occur on the lower reaches of these creeks.
Heavy growths of blue bush (kochia selifolia) and scattered quondong trees (santalum acuminatum) also occur in the sandy loam country while in the dune country, thick growths of umbrella wattle (acacia ligulata) crown many of the dunes. The sand-dune and sand flat areas are almost bare of small plants in the dry seasons although succulents and remnants of a few of the woodier small shrubs survive on the inter-dune flats. Good rains, particularly in the cooler months of the year will result in a heavy and rapid cover of wildflowers and herbs on both dunes and flats. Extensive and vigorous growths of saltbush are included in this ground cover and in a few locations dense growths of the Murray Lily (crinum flaccidum) occur after heavy rains in the warmer months. Generally speaking, the ground cover of these sandy areas is little different to the sandy areas of inland southern Australia.

The ground fauna of the area is also highly dependent on rainfall in terms of population density. The species are similar to other arid inland areas with the largest being the emu, the red kangaroo (macropus rufus) the euro (macropus robustus) and possibly one of the wombat family (assumed resident as a result of large burrows particularly along the northern fringe of the area). A number of smaller marsupials exist mainly in the dune areas and a wide range of reptiles, the largest being the sand goanna (varanus gouldii), are spread over both habitats. The birds of the area are also common to inland Australia generally with the wood pidgeon (ocyphaps lophotes) and the galah being quite common amongst the larger species. Water birds are non-existent during dry years.

The advent of those sporadic wet seasons, when lakes fill and vegetative growth is rampant, sees a rapid growth in the ground fauna population over a couple of years. The fresh lakes, swamps, waterholes and claypans are filled and rapidly develop a teeming population of shield shrimp (triops australiensis) and many other smaller crustacea all of which have rapid and prolific breeding cycles. The appearance of the water life is quickly followed by a large influx of water birds; the larger species being the black swan, seagull, pelican and four or five species of duck besides many smaller water and shoreline feeders. For many months the lakes are dotted with large numbers of birds, many of which will remain for several seasons or as long as the water lasts; some species may have at least one breeding season in the area. (Fig. 4).

It will be seen that under present climatic conditions, the Arcoona plateau has a harsh dry environment much of the time. Nevertheless it is capable of maintaining a strong nucleus of flora and fauna from which a population explosion occurs during the sporadic good periods. Likewise it would maintain a small nomadic aboriginal population that could swell with the influx of other groups in these good seasons when the lakes fill.

CULTURAL ASPECTS

Evidence of aboriginal activity is abundant in many parts of the area. The sandy banks of watercourses, the sandy margins of canegrass swamps and the margins of claypans all reveal a great number of wind eroded campsites many with densities of artefacts so great that it is impossible not to walk on them. Most of the sites are located in the valleys of the creeks feeding the main centres of drainage as for example the northeast portion of Lake Hart basin and the southwest portion of the Shell Lagoon basin. Although the campsites of the area cannot be placed in sharply defined categories, differences are apparent and for this discussion a rough grading of major, medium and small has been applied. Major sites are dense, large sites up to 100 metres or more across and situated near long term water sources; medium sites may be dense but considerably smaller and near less reliable.
sources of water, while the small sites are often not near any but temporary water sources and having a restricted range and quantity of artefacts and an area perhaps less than 20 metres across. No campsites exist among the saltbush and gibbers of the plateau although where dune sand has moved out of the valleys and basins up onto the plateau surface, small and medium sized campsites occur in some cases.

Most of the main centres of drainage have at least one major campsite and many lesser sites which are scattered out along the watercourses and claypans. The drainage centres with their associated campsites would tend to become centres of aboriginal activity as contact with other similar centres is severely restricted by a barrier of difficult and usually waterless saltbush and gibber country. However, this waterless country is penetrated in a number of places by narrow access routes that follow certain streams. These streams are furnished along most of their length by sandy tracts and claypans, with soak water being available in a few places when the waterholes have dried up. These routes provide a relatively easy access between the main centres of activity for trade and social intercourse (Fig. 3). The Yandandarre Creek appears to have drained Fred's Camp Swamp near Woomera at one time, provides one of these routes from Shell Lagoon to Philip Ponds and Fred's Camp Swamp. The Wirrawirralu Creek connects Philip Ponds to Lake Richardson and from the latter area Rocky Creek connects to the Pines basin locality. Easy access exists from Lake Richardson to Lake Arcoona and then by a series of swamps and sandy areas to the whole complex of centres to the northeast and also to the headwaters of the Elizabeth and other large creeks to the southeast. Many other routes exist and most centres of activity can be reached from any other by means of this network of routes through the plateau.

Fairly densely artefact covered medium to small campsites occur in many places along these access routes, however it is not suggested that the artefacts on these sites all originated with the travellers. The large proportion of implements are no doubt the result of the use of the sites as seasonal hunting bases and preliminary surveys of implement collections confirm this. If a distance of 12 to 15 kilometres is allowed for a family's unhurried daily travel on these routes, then most routes would involve the use of at least one campsite for overnight camps along the way.

Most campsites in the area are closely related to sources of water and the proximity of saltbush and gibber areas. The major sites are invariably located near spots providing long term water supplies even if this may only be soak water some of the time. These major campsites always show an association of clean, sheltered, sandy camp spots with saltbush and gibber areas close by. Most of the rock engraving sites are found within an hour or so's walk of a major campsite. Similarly located are sand or claypan areas featuring stone arrangements, numerous ochre pieces or curiously shaped large stones, suggesting sites of ceremonial significance.

A number of medium sized campsites, often densely covered with implements, are associated with canegrass swamps particularly along the northern margin where the gibber plateau gently dip beneath the sand country. In these cases, the campsites are often in the sand right beside the swamps which are usually fairly small. Other medium sized sites occur in low sandy areas to the northeast of the large swamps on the plateau proper, such as Fred's Camp Swamp and Womsey Swamp; they are often some hundreds of metres from the swamp itself. At Fred's Camp Swamp they occur as exposures of artefacts on claypans and lying low dunes for a kilometre or more along the northeastern slope of the swamp basin. As the swamp holds water only after the most exceptional rains and no other water source is available except for very short terms on the small claypans, the large quantities of artefacts and extensive campsite areas strongly suggest a more pluvial climate in the past.
FIGURE 3 EXPLANATORY NOTES

1 = Shell Lagoon Basin - important campsite complex.
2 = Yandadare Ck. sand flats.
3 = "Philip Ponds" Basin - important campsite complex.
4 = Lake Richardson Basin - not fully explored.
5 = Rocky Ck. sandflats.
6 = "The Pines" Basin - Campsite Complex.

The various sections are inter-connected by means of small gorges, low clay pan and alluvium saddles and short saddles of saltbush and gibbers as shown on map.
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**LAKE WATER DEPTH.**

- Lake Arcoona: (measured)
- Lake Richardson: (Estimated)

The fall rate ignores effect of seasonal weather changes and minor rainfalls.

**Note:** Prior to 1972, the lakes were filled by the heavy rains of 1967-68 after a long dry spell. During most of the period 1967-72, they carried varying depths of water.

**WATER BIRD ACTIVITY.**

- Ducks, swans, seagulls, waterfowl
- Birds return in greater numbers and species
- Birds nest on Arcoona, islands are dried, most birds leave
- Gulls nest on Arcoona, islands are dried, many young leave
- Many species of birds nesting on islands and lake edges
- Water clears, birds all return
- Birds so dense could not see the water, lake water and nearby station dammed by birds
- Birds return to Richardson, only few on Arcoona, which is muddled

**THE RELATIONSHIP OF HEAVY RAINFALLS, LAKE LEVELS AND WATER BIRDS.**

**FIG. 4.**
Campsites are not necessarily associated with all good waterholes; this is particularly so in the gorge reaches of the streams where the waterholes occur in gibber country. In most of these cases, artefacts are remarkably sparse in the vicinity.

In respect to the sites mentioned earlier, that occur in sand driven out of the basins onto the tableland; these waterless sites (except for short term water on their claypans and small canegrass swamps) are often several kilometres from reliable water. These sites appear to have been used as a hunting base, possibly immediately after rain has put a little water into the claypans and thus attracted some of the larger game on the tableland. Emu Hills is an example of this kind of site. It consists of a sandy claypan tract about 3 kilometres long by half a kilometre wide and is situated 5 or 6 kilometres downwind from the northeast rim of the North East Lake Hart basin area. The sand appears to have originated in the basin and then been driven out over the gibbers as an isolated mobile dune front that has left in it's wake claypans and sandy patches dotted with umbrella wattle and smaller shrubs.

Campsites of significance are not specifically associated with fresh water lakes but often occur along the lower reaches of the streams feeding the lakes. The exposed and shifting nature of the lake margins would be a deterrent to their use while more habitable sites are available on the nearby watercourses. Perhaps the desire to retain the lake, when filled, as an undisturbed hunting domain is also a factor to be considered.

The location of major campsites can be summarised as being near a reliable long term water source in a clean sandy spot, well sheltered, but with easy access to the sand areas to take advantage of abundant food supplied following good rains, and also near the saltbush areas from which the larger game would emerge for water in drier periods. The widest variety of fruits, vegetables and game would have been available near these sites.

The natural resources of use to the original inhabitants of the area are many and varied. Of the lithic materials, quartzite constitutes the most common material occurring in assemblages of artefacts from most parts of the region. It outcrops in many places and is so plentiful that identifiable varieties are seldom numerous in assemblages from centres of activity other than those in which the outcrops occur. These quartzites are found in a wide range of colours and textures with perhaps light and medium grey predominating in the colour range while fine grained to very fine grained chaledonic materials predominate the texture range. These quartzites are found in gibber form in some cases, and occur as boulder outcrops in a number of localities such as Whiskey Swamp, Mungapple Hut and northeast of Lake Hart. Their origin is in the remnants of Tertiary landforms usually occurring in the wider valleys and basins. (Johns 1968:40-2).

A similar material occurs in the form of nodules of silcrete of mid grey to pale buff in colour and of variable grain size and texture. It is found over most of the saltbush and gibber area and is more prevalent in assemblages from the smaller and outlying sites close to the gibber areas. It has its origin in the Tertiary duricrust. (Campbell and Edwards 1966:163-8).

Chert is another important material and nodules of gray to fawn coloured material have been quarried from the edge of a Tertiary mesa near Phillip Ponds just east of Woomera. It occurs plentifully in assemblages from sites for some kilometres around and also in sites near Lake Richardson. For certain styles of implements it replaces quartzite as the principal material and specimens of this material occur on sites from the more distant parts of the area, suggesting some value placed upon it for trade purposes.
A dark brown to blackish indurated mudstone is commonly used for crudish implements in some localities, the most notable being Shell Lagoon where the material occurs as the shattered remains of 'fossil' mudpans.

Along part of the northern margin of the plateau, oolitic chert occurs as surface nodules over an extensive area. This very beautiful material is found in a wide range of colours and patterns. The nodules often have a translucent chalcedonic centre grading into various shades of amber, orange and brown towards the cortex. The oolitic markings are clearly seen even in some of the translucent sections. The clastic properties of the material render it most suitable for strong sharp blades. It competes with quartzite as the most common artefact material along much of the northern margin of the area and occurs with decreasing frequency in assemblages towards the further most parts of the plateau. Quarries as such are not known probably due to this materials fairly wide occurrence as surface nodules on parts of Purple Downs and Roxby Downs Stations. It appears to be most prevalent on Coolay, Ck. north of the Purple Downs homestead.

On the slopes of most of the large basins of the area, exposures of water rounded pebbles and small boulders occur as the remains of Tertiary stream beds. These pebbles are very smooth and rounded or ovoid in shape and vary in material from fine grained quartzite to sandstones of various textures. They are the source of most of the hammers, grinders, mullers, anvils, split pebble tools and other similar implements found in the area. The prevalence of the material in the basins containing most of the campsites obviates the need to carry these large camp implements from camp to camp; they can be left in situ after use.

The material from which lower mill slabs are prepared is also fairly common near most campsite areas and occurs in textures varying from fine sandstone to largely quartzitic sandstone. The platy tendency of many of the sandstone formations of the area, make very little preparation of the implements necessary.

Igneous rocks are completely absent in the plateau area and the surrounding areas for a great distance. As a result diorite and similar ground axes are exceedingly rare in the area, the writer knowing only of about 10 or 12 being found in the ten years spent in the area. Although some of these axes showed some wear, the majority were highly polished over most of their surface, beautifully shaped and hardly used, suggesting the possibility of their use mainly as status or ceremonial objects. The scarcity of these implements may also be related to hatchets being of restricted use in a region devoid of tall trees and the associated fauna, where the need for a single handed chopping tool and climbing aid is of little importance.

Colouring materials, in the form of ochres and other minerals, occur as numerous deposits mainly within the basin areas. A great range of shades in red and yellow ochre is fairly general while in the Shell Lagoon area an olive green ochre occurs and pieces have been found on local campsites. Nodules of manganese ore (pyrolusite) have occurred in artefact collections from most parts of the area and is apparently used for grey black colouring. It's origin is in deposits along the west side of Pernatty Lagoon. Kaolin and kaolinitic siltstones are common in many parts of the area and would provide a source of white colouring. Specular haematite appears on rare occasions on campsites and provides a deep maroon colour containing a sparkling element. This material occurs as a small outcrop in the bed of Ironstone Lagoon not far from the old Woocalla railway settlement. Occasional pieces of barite crystal have been found on campsites; this also originates on the west side of Pernatty Lagoon but it's use is uncertain.
There are several other rare or exotic materials found on campsites of
the area. Rock crystals and their chips are found on most sites; the smaller
specimens probably originating in extensive gravel and small pebble deposits
north of Lake Koolymilka and northeast of Shell Lagoon. The larger specimens
may have originated on the plateau just south of Shell Lagoon where the writer
has found them sparsely spread amongst the gibbers. Australites (tektites)
and australite chips (some of which are worked) are occasionally found on
campsites, however it must be assumed some of the unworked ones would have
fallen there naturally and subsequently been exposed by erosion. Remnants
of shells, mostly appearing to be parts of abalone shells, are found on sites
from all over the region from time to time. A fine specimen of neck ornament
was found at Lake Hanson in the far west of the area in 1970 and appeared to
be identical with the borer shell ornaments reported as originating on the
northeast coasts.

The description of the stone implements of the area is a subject in itself
and will not be dealt with in detail here. However, the implements of the
area can be briefly described as being generally typical of the Eyrean region
(Campbell and Edwards 1966:161-2) and are representative of styles from the
earliest cultures to historic times. Large hoof cores and large crude chopping
and scraping tools are common on certain sites. Pirrian and microlithic styles
are common, also the hafted adze stones. Polished and ground implements are
virtually non existant. A number of forms of implement not generally described
as styles are common enough to warrant further investigation and description.

The possibilities for obtaining a dating of the stone implement assemblages
by the conventional archaeological means of stratigraphic excavation and carbon
dating, are rather remote as rock shelters worthy of the name do not exist in
the area and invariably the surface campsites occur in areas of drifting sand.
However, although most sites have been denuded of sand by wind erosion many
times and the artefacts all deposited together at hard pan level, a few
locations have revealed a degree of stratification. In the case of sites in
the mobile dunes on the plateau top where the dune front may have drifted
several kilometres since habitation of the area began, some degree of deter-
mation of the chronological sequence is possible. In these cases, a
statistical analysis method perhaps better described as 'horizontal archaeology'
could provide information of cultural sequences as a result of the continuing
horizontal movement of the most suitable campsite position. Emu Hills south
east of Lake Koolymilka is one example of these sites, others occur further
west in the Arcoona Homestead direction.

Examples of aboriginal art and ceremonial activities are to be found
throughout the area. An interesting pattern of arranged lines of stones and
associated heaps occurs in a secluded claypan on the plateau above Disputed Ck.
on Arcoona Station while a kilometre or so further upstream above a large water-
hole there are several hundred heaps of small stones similar to those found in
parts of western N.S.W. (Kelly 1968:565 & Plate 11). A previous manager of
Arcoona Station considered these heaps to have been the work of railway
employees. The E-W railway is about a kilometre distant but as the stones are
unsuitable for ballast due to their rounded nature further investigation is
necessary to indentify the origin of these heaps one way or the other. Circles
of stones have been reported from other parts of the plateau whilst overlooking
Yandandarre Ck. a few kilometres from Shell Lagoon, there is an arrangement of
standing stone slabs. Many of the slabs have fallen or are leaning badly due
to the deep clay soil becoming unstable after heavy rains and as a result a
degree of urgency exists if arrangements of this nature are to be authenticated
and described before their relatively short life ends. It has been noted that
all stone arrangements I have seen in the area are remote from large campsites.
and generally in secluded spots where activities could not easily be watched by outsiders or the uninitiated.

A number of rock engraving sites have been found within a 50 kilometre radius of Woomera and no doubt others exist in the remote parts of the plateau. Two sites are known on the Wild Dog Ck. near Lake Koolymilka, one in a valley northeast of Lake Hart, and another at the head of a deep ravine northwest of Lake Hart. The well known group on the Eucolo Ck. is the most extensive in the area but two other sites occur on the same creek, one of which has a large boulder in the creek bed engraved over it's semi-ovoid upper surface in patterns suggestive of a giant tjuringa.

Two further sites occur on the Disputed Ck. near the above mentioned stone heaps and arrangements. Most engravings are single line types but some itaglio pecked examples, such as the giant emu tracks at Eucolo Ck., occur at the larger sites. In general, bird and animal tracks predominate but concentric circles, various patterns and 'ceremonial men' designs are known. Again, the locations are all remote from large campsite areas and all are in the saltbush and ginder country, their locations being to a large extent predictable. The arcopna quartzite member of the geological sequence is a very hard horizontal bed underlain by softer rocks throughout a large part of the upper portion of the plateau. Creek erosion exposes this layer and eventually it is cut through to the softer rocks below, resulting in a small waterfall formation at the breakthrough point with a small pool below and a ravine downstream, while upstream a broad shallow creek bed is paved with smooth rock surfaces for some distance. It is on these pavements and boulders of the same material in the ravine below the breakthrough that the engravings are likely to occur. As these conditions exist in many parts of the archaeologically unexplored eastern half of the area, it is anticipated that further sites will be located in the future. Patination and discolouration of the engraved surfaces is generally even from one site to another but wear is quite variable. Engravings on pavements exposed to the periodical running of the creeks are in many cases very faint while those on boulders well above waterlevel are deep and sharp. Only the main sites at Eucolo Ck. appear to have had any attention from vandals.

Apart from rock engravings and stone arrangements, there probably existed from time to time, many other sites of ceremonial significance. The only evidence I have found of these sites however, has been in the form of curiously shaped stones on a number of eroded sand sites. These sites usually occurred remote from any large campsite and often on the slopes of, or in the top of high dunes. For instance one such site is N.E. of Shell Lagoon about 6km and located in the basin like top of a large isolated dune just east of an extensive mud pan. In this site which had comparatively few artefacts, there were found several slabs of rock with white colouring material on them, numerous lumps of red and yellow ochres and 5 or 6 stones shaped like stumpy cylindro-conical stones (See McCarthy 1967:62-5). Northeast of Lake Hart, the blown out N.W. slopes of the highest dune in the area revealed few artefacts but numbers of large odd shaped stones and many pieces of ochre again suggesting ceremonial activities. Another site is just south of Lake Windabour where the highest dune in the area rises east of the Disputed Ck. estuary. Again, this site was remote from campsites and had few artefacts on it but a number of natural stones were found that had phallic aspects or had natural grooves and markings that had been accentuated to enhance their phallic aspects. (See McCarthy 1967:67 & 77).

Nothing, as far as I can ascertain, is known of the significance in aboriginal lore of the natural features of the area even though some unique formations and shapes do occur in an otherwise remarkably uniform landscape. One such formation is the remains of a fossil stream bed (Johns 1968:PLXXXIII Fig. 2) in the form of conglomerate boulder wall up to 5 or 6 metres high
and several hundred metres long. It is in a very small rock shelter at the base of this formation that the only reported rock paintings occur. They depict a few birds and animal feet markings and one large oval with a few transverse lines across it. These paintings are becoming quite faint now.

SUMMARY

Part one has outlined a habitat related to the association of saltbush and gibber plains, rocky gullies containing waterholes, sandy scrub areas, semi-mobile dune systems, and fresh water lakes that appear spasmodically under present climatic conditions.

Some of these features occur in other parts of the continent but never in the combination found in this area; the resulting rather unique environment would have been capable of sustaining a strong nucleus of aboriginal life in the most severe dry periods and providing abundance in times of exceptional rains. A slight change in past weather conditions allowing a more regular monsoonal or tropical influence could have transformed the area into a very rich habitat for aboriginal life.

The very heavy concentration of stone implements on wind eroded sites may be due, not only to heavier population densities in past periods of moister climate, but also related to campsites being in mobile sand locations thus rendering the loss of unhafted implements by sand cover a common occurrence. It is also very likely that the great abundance of first grade lithic materials would contribute to the discarding of implements at an earlier stage of their life - it being easier to make a new tool rather than rework worn or inferior ones. These two factors suggest the area as an excellent basis for further investigation of the development and use of the little understood styles amongst the stone implements of the Eyrean Region.

In describing the habitat and evidences of aboriginal activity an attempt has been made to show that the area provided a unique environment conducive to it being an important centre of aboriginal activity over a long period of time.

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REGISTRATION re October long weekend trip to Robe.

SATURDAY 7 OCTOBER TO MONDAY 9 OCTOBER 1978

Please complete, crossing out items not applicable, and return to the Secretary as soon as possible.

1. I intend to participate in the Field Trip and will be accompanied by

   NAME
   ..............................................
   ..............................................
   ..............................................
   ..............................................
   ..............................................

2. I can provide my own transport and transport for the people accompanying me (if any) Yes/No
or
   I would like transport to be provided for me and the people accompanying me (if any). Note that if you are allocated a seat in a vehicle it will be your obligation to discuss cost if any with the driver. Yes/No

3. I can provide transport for ...........people other than those mentioned above (if any).

4. I will require Motel/Hotel accommodation. Note that it will be your responsibility to make these arrangements. Yes/No

5. I have elected to camp with the main party and will require assistance in providing the following for myself and others accompanying me. Tenting Yes/No
   Stretcher Yes/No

Please bring your own sleeping bags.

6. My name is ..................................

   Address ........................................
   ..............................................
   ..............................................

   Telephone ................................. Work ............................... Home

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