

# AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

McCarthy, Frederick D., and N. W. G. Macintosh, 1962. The archaeology of Mootwingee, western New South Wales. *Records of the Australian Museum* 25(13): 249–298, plates 19–27. [3 December 1962].

doi:10.3853/j.0067-1975.25.1962.665

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

Australian Museum science is freely accessible online at  
<http://publications.australianmuseum.net.au>  
6 College Street, Sydney NSW 2010, Australia



VOL. XXV, No. 13

SYDNEY, 3 DECEMBER, 1962

**RECORDS**  
of  
**The Australian Museum**

(*World List* abbreviation: *Rec. Aust. Mus.*)

Printed by order of the Trustees

Edited by the Director,  
J. W. EVANS, Sc.D.



*The Archaeology of Mootwingee,  
Western New South Wales*

By

F. D. McCARTHY and N. W. G. MACINTOSH

Pages 249-298.    Plates XIX-XXVII    Figs. 1-9

---

Registered at the General Post Office, Sydney, for transmission by post as a periodical

G 31690

## The Archaeology of Mootwingee, Western New South Wales

BY

F. D. McCarthy,  
Australian Museum  
and

N. W. G. Macintosh,  
University of Sydney

(Figs. 1-9) (Plates XIX-XXVII) Manuscript received 20.9.61

### PREVIOUS LITERATURE

The rock engravings in the main gallery, and the paintings in the "Big Cave", have been described briefly, and some of the main carvings and paintings illustrated, by Pulleine (1926), Riddell (1928), Barrett (1929 and 1943), Davidson (1936), Black (1943 and 1949), and McCarthy (1957 and 1958). Pulleine's claim (op. cit. 80) that he recorded all of the motifs at Mootwingee is far from being the case. These papers indicated that Mootwingee was an important comparative site on the eastern extremity of the full intaglio pecking technique, and a complete recording was therefore decided upon.

### CURRENT WORK

One of us (F. D. McC.) assumes total responsibility for the sections on "Pecking Methods, Patination and Antiquity, and Affinities of Paintings and Engravings."

One of us (N. W. G. M.) assumes total responsibility for the map and topographical descriptions and for the sections on "Dingo Rock and Mythology of Mootwingee according to George Dutton".

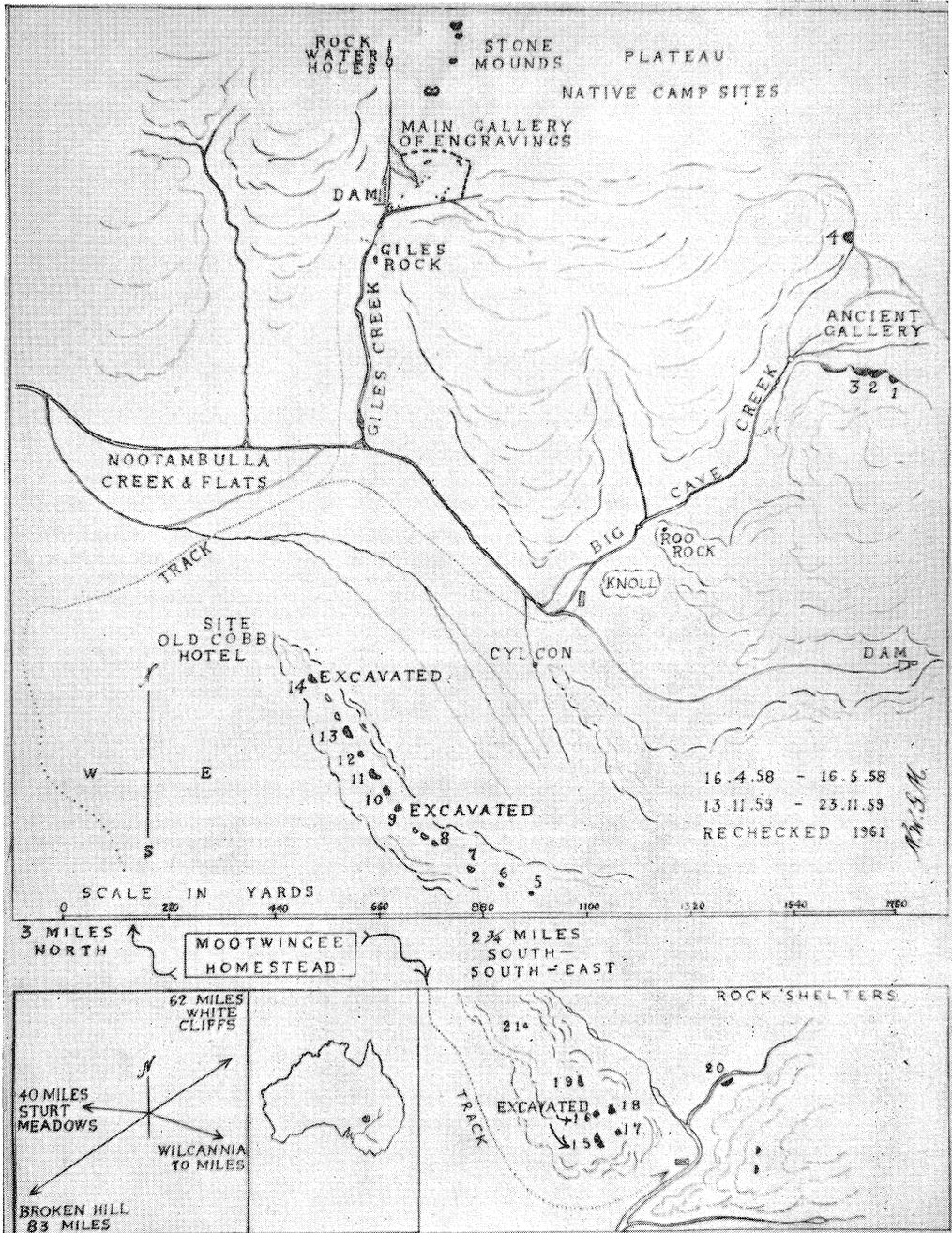
The remainder of the paper, the first draft of which was prepared by F. D. McC., is dual.

### HISTORY

It is probable that Wright, the third in command of the Burke and Wills party, who was added to the expedition at Menindee because of his wide knowledge of the country to the north, was the first white man to see the strange markings on the rocks. The route of the expedition passed Mootwingee (as Wills recorded the name originally) on October 16th, 1860, and although Wills mentioned the existence of permanent water there he did not refer to the engravings. Ernest Giles used the valley in which the carvings are situated as a regular camping place, and left inscriptions (discovered by Mr. A. Morris in 1921 on a tributary of Nootambulla Creek) recording his visits in July, 1861, and August and September, 1863. Dow (1937) accepted the probable authenticity of Giles' inscriptions. Howitt's relief party followed the same track in 1861, and it was thereafter used by all travellers to the north from Menindee and the Darling until pastoral development of the Broken Hill district began in 1866.

As the main gallery of engravings is only a furlong from Giles' inscriptions, both his party and many other white men must have seen it between 1863 and 1890, as it is right beside the rock-holes from which travellers drew water in this valley. There are no historical reports by the early explorers or subsequent travellers of natives or native ceremonies at these sites. The old coaching-days hotel, built about half a mile away, also drew water from these rock-holes which were dammed with concrete for the purpose.

The early white settlers drove the natives off their traditional country to ensure undisturbed grazing for sheep and cattle. Such an antagonistic attitude did not encourage interest in the Aborigines, and little has been recorded about the rock art and religion of the far western tribes. Dr. MacGillivray, of Broken Hill, was the first naturalist to take an interest in the Mootwingee site, to which he took Dr. Pulleine, of Adelaide, in 1935, and the latter's brief paper appeared a year later.



Text Fig. 1—Map showing total Aboriginal sites at Mootwingee Reserve described in the text.

The presence of permanent water in the numerous rock-holes (not as now despoiled by goats, sheep and horses) must have been a valuable asset to the local groups of Aborigines in the vicinity of Mootwingee. The tribe was called the Bulalli by Howitt (1904, 49), the Wilyakali by Tindale (1940, 195, map), and the Bandjigali by Beckett (1958, 92). As Bonney pointed out (1883, 2), the country in its natural state could not support a large population, being subject to periodic droughts of which he experienced three lasting from 18 to 22 months in 15 years. During these droughts, he said, the surface waterholes dried up, and the natives camped at the springs or rivers, existing on the half-starved animals which were killed without much difficulty. The country had a desert-like appearance, relieved by sundry hardy bushes and small trees which somehow held up against the extreme dryness and hot winds. Bonney (op. cit.) said the long droughts were generally broken by a fall of two or three inches of rain, followed by lighter rains, which rapidly improved the appearance of the country, the waterfowl returned in large numbers to the creeks and billabongs, and the Aborigines moved on to fresh hunting grounds. Keast (1959) has postulated that the breeding rhythms of animals are deferred until a drought is finished, and many birds migrate out of the stricken areas. After a series of good seasons, the rock-holes and pools in Nootambulla Creek contained an abundant supply of water in 1955, but since then there has been a series of dry seasons and (apart from the rock-holes dammed with concrete walls) very little water available in the natural rock-holes, and none in the creek bed in 1959.

Bonney estimated the average native population of far western New South Wales to be 100 persons to 2,000 square miles, an area that would cover the Mootwingee reserve and the surrounding country for a radius of about 20 miles. It is apparent, therefore, that the 21 caves of paintings, the main and other galleries of engravings, and the numerous camp-sites must have been the work of many generations. The 1883 census of the Aborigines Protection Board stated that there were more than 300 natives in the vicinity of Tibooburra, and probably more on outlying stations. In 1915, there were no more than 50 natives in the same area (N.S.W. Govt. Papers, 1883-1915).

Beckett (1958, 93) said that the last initiation ceremony of the Bagundji (south of the Bandjigali) was held in 1904, and the last Milia rite in 1914; that no Aborigines under 40 can now speak their language, and there are none living who can recall the coming of the white man. Remnants of the various tribes now live in Wilcannia, but they are also scattered from Tibooburra to Bourke and Brewarrina.

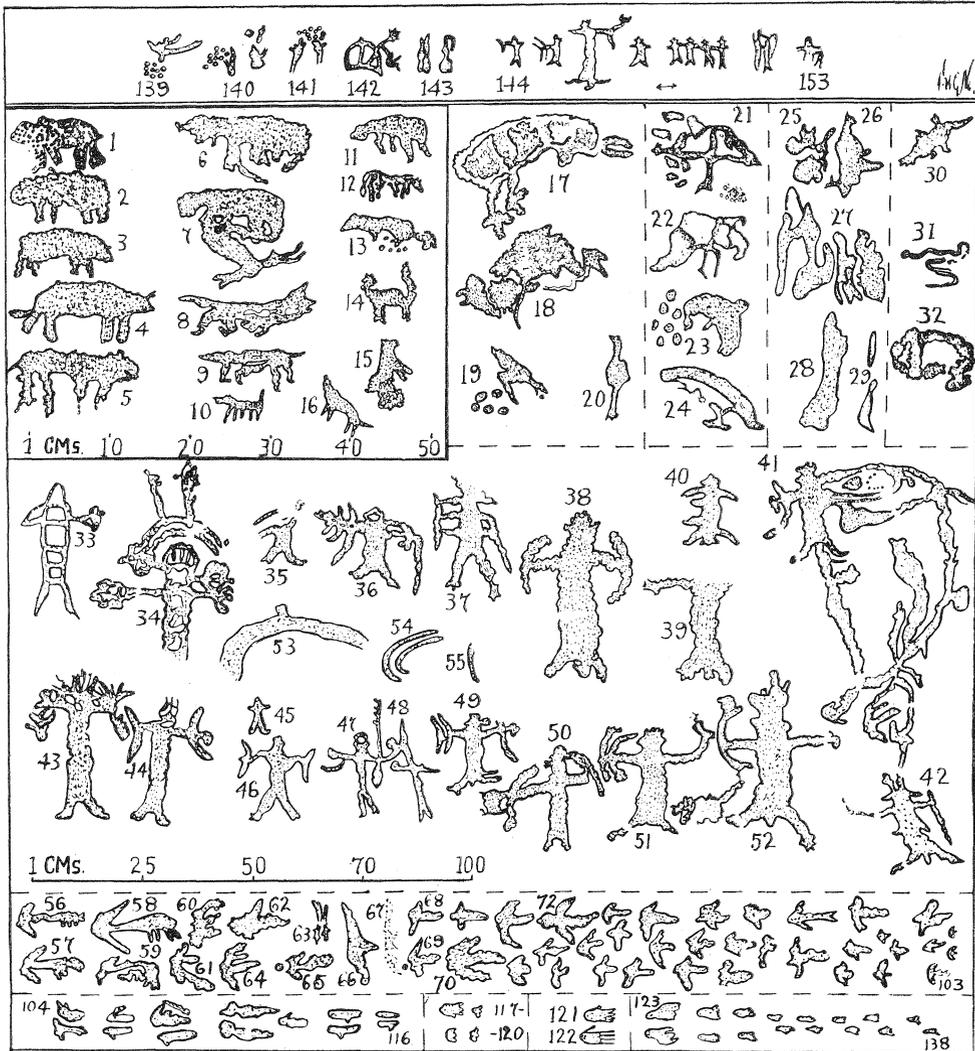
The Bandjigali (Beckett, 1958, 92) were probably "organised into inter-tribal patrilineal clans, ceremonial groups supposedly descended from a *mura* ancestor who once travelled, naming and forming the country as he went". These clans extended across tribal boundaries into the Maliangaba, Wonggumara and Gunggadidji tribes. Some of these sacred *mura* tracks go from the White Cliffs district up to Bulloo Downs, others stretch from the Paroo to Lake Eyre. Matrilineal moieties of Eaglehawk and Crow are general in this region (Radcliffe-Brown, 1931).

## GEOGRAPHY

The map (q.v.) indicates the topographical relationship of the galleries and accessory sites of rock engravings, the 21 caves which contain stencils and paintings and/or engravings, the four caves possessing floor deposits which were excavated, four stone mounds and surface sites where implements were collected on the Nootambulla Creek flats and on the plateau which bears evidence of native camp-sites. The presence of so many facets of Aboriginal activity makes the site a valuable one for correlative analysis. Each of these facets is described. An area of 18,840 acres was proclaimed Reserve 59533 for the preservation of caves at the request of the Broken Hill Field Naturalists' Club in 1927. The map shows that the Mootwingee Reserve is 83 miles north-east of Broken Hill, 62 miles south-west of White Cliffs and 40 miles almost due east from Sturt Meadows engravings. The Broken Hill-White Cliffs road passes within a mile of the western side of the Reserve. Lithgow (1961) has described the natural history of the area.

The caves and galleries occur among a series of ridges and hills which are part of an extensive dissected plateau of ancient massive sandstones, quartzites and conglomerates. The valleys are flat-floored, narrowing into gorges or canyons at their heads or into long steep slopes of rock. Large rock holes from 10 to 30 feet across have been waterworn into these slopes in the course of time, and some hold water permanently.

For descriptive purposes the creeks traversing two of these valleys have been arbitrarily named Giles Creek and Big Cave Creek, the former because of an inscription purporting to have been made by the explorer, the latter because the largest stencil cave at Mootwingee is near its headwaters.



Text Fig. 2—The motifs shown in the mass composition in Plate 2 have here been extracted and segregated into dingoes, emus, (? birds), unidentified objects, reptiles, men and material culture, emu tracks, wallaby or kangaroo tracks (hind and fore), human hands and feet. The top series, Nos. 139-153, located near the apex of Dingoo Rock and not shown in Plate 2, are separated from the other motifs by a sterile strip of rock and are considered to belong to an emu composition on an adjacent slab. They are much smaller in size and different in type. This is one criterion for believing the fracturing of the gallery into slabs occurred after completion of the engravings. Scale is approximately the same for all figures except the Dingoes, where it is approximately x 2.

Both these creeks flow into Nootambulla Creek commonly, but wrongly, known as Mootwingee Creek. The creeks are fringed with white gums frequented by white cockatoos, galahs, crows, magpies and other birds. A variety of acacias, including beefwoods, grow among the pines and other trees and bushes on the rocky slopes adding an attractive note of green to the general reddish-brown of the rock formation. Possibly the flats were covered with mulga and other vegetation prior to white occupation.

The stone of the galleries is usually white when freshly broken, but tints ranging from pink to reddish-brown and dark brown are exhibited on weathered surfaces according to the degree of oxidation and the content of iron oxides (Kenny, 1934, 54). Some surfaces are blackened by a resinous gum shed from beefwood trees growing in crevices beside them. Mitchell said the blackened surfaces were due to the deposition of limonite, a hydrated oxide of iron. Damp, decaying vegetation has probably played a part, too.

The sandstone is merely the skin of a conglomerate of waterworn pebbles which are exposed in many places and weathered out of the formation in great numbers. In places like the Main Gallery the massive sandstone is laminated and broken into flat-sided slabs up to several feet thick. Almost all the engravings occur on fine-grained, sand-polished surfaces.

The Main Gallery of Engravings is situated on a rocky slope between a steep narrow valley containing the head of Giles Creek on the west and another narrow tributary on the south-south-east. Its long axis is 190 yards and its traverse axis 60 yards; it slopes upwards from the south-west to the north-east at an angle of about 20 degrees. At its base is a deep waterhole, and 50 yards further north a dam, constructed to provide pipe supply to the old hotel, marks the site of a former waterhole now silted up.

One small and two more large waterholes occur up to 250 yards further north. All are replenished by drainage from the higher slopes at the head of Giles Creek Valley. It was up Giles Creek that the *mura* Kulabiru (Syn: Kwilabiru, Guluwira) walked on his journey from the south, and each of the waterholes was made by his footsteps; as each was made he cried *kokaru*, i.e., the hole, and in each subsequently there grew a *ngaitchi*—water snake. This is according to our informant, Mr. George Dutton, who as a lad was taken by his father up this creek in the pathway of Kulabiru.

The present surface of Main Gallery is fractured into rocks of all sizes, and many flat-topped slabs lie loose on the surface or in large crevices created by the breaking-up of the outcrop in the past. Practically every suitable rock surface on this slope bears engravings. Smaller series of engravings are to be seen within a quarter mile to the south and south-east. A small number of figures was found on top of a high and isolated outcrop (knoll) near the junction of Big Cave and Nootambulla Creeks. Engravings of human and other figures occur here and there on the walls of Giles and Big Cave Valleys, and in particular a large kangaroo (Roo Rock) on a spur south-east of the lower portion of Big Cave Creek.

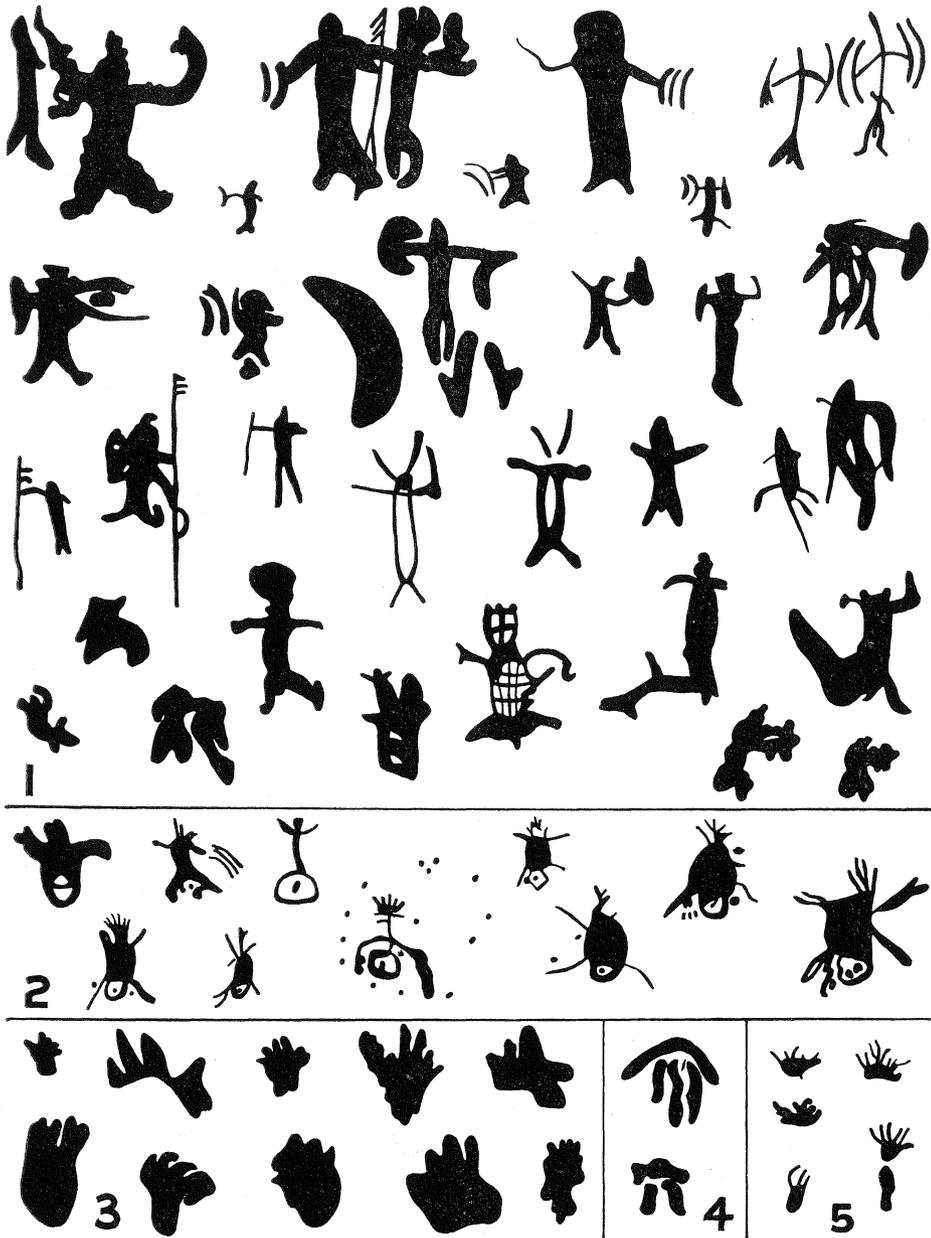
An old and now almost weathered-out gallery apparently existed on the slope north of Big Cave (Cave 2), and another on a small slope above Main Gallery.

### ENGRAVINGS

A feature of the engravings is the use of topographically quite widely separated rock surfaces for the portrayal of different subjects and distinctive compositions. These can be grouped as follows:—

Plate XX illustrates one large rock and two adjacent sections of rock devoted to an intermingled collection of repetitive motifs, including a most ornately decorated humanoid figure with elaborate head-dress, undoubtedly a Cult Hero, perhaps a *mura* ancestor, men moderately decorated and/or heavily armed, and men undecorated and lightly armed. Associated with representatives of each of these is a mammal-like figure tentatively identified as a dingo; hence this section of the gallery has been arbitrarily called Dingo Rock. Among four or five emus is a large, banded, distorted one, only partially pecked, but with deeply grooved outline, and apparently it is older than the others. There are also separate boomerangs, human tracks, kangaroo tracks, emu tracks, many emu eggs, a large coiled snake and a goanna. The site is half-way up the south-eastern edge of the Main Gallery. It will be described separately further on.

Plate XXI illustrates five examples of the repetitive portrayal of a single motif on a separate rock surface. The first shows an assemblage of some 20 men armed with spears, boomerangs and spearthrowers, one unarmed man beside a double-tailed concentric circle, and a kangaroo. The armed men are of three sizes—larger, intermediate, smaller. They suggest a kangaroo-hunting party. Instead, our informant, Mr. George Dutton, identified the group as a rain-making party; the outer circle represents the waterhole, the inner circle the pile of coolamons containing each



Text Fig. 3—1. Varieties in human portrayal. Note the lack of standardisation of type. 2. Series of female figures. 3. Human feet and hands. 4. Wind breaks. 5. Feather plume ornaments. Figures from 4 to 12 inches long.

man's fire-burned rain-stones, blood and feathers ; the unarmed man is the one who goes into the waterhole to place and hold the coolamons in position ; the two tails of the circle represent the track where the rest of the party walk in to stand on the first man's shoulders and hold him down while he arranges the coolamons. The kangaroo is part of the reason for the rain-making ceremony. This rock of the " Rain-makers " is situated in the middle of Main Gallery.

The second photograph illustrates little men 6 in. tall wearing very tall turret-shaped head-dresses or masks from 1 ft. 6 in. to 4 ft. 6 in. high, which are decorated with bars, and three of them include rounded dots (? emu eggs) and kangaroo and emu tracks. These head-dresses provide proof that ceremonies were carried out at this site. Our informant, Mr. George Dutton, identified them as *kungulada*, that is, tall hats, for the emu corroboree which was operative at Nockatunga in his youth and diffused down to Tibbooburra prior to its extinction. This rock of the " Tall Hats " is situated near the apex of Main Gallery.

The third photograph presents 12 tiny female figures ; some are wearing either a plume-like forehead band or long hair shown in radiate fashion. Three of them have thin stick-type bodies and limbs, others thick heavy bodies, and one an anvil-shaped body. One has curved and upraised arms like a flying bird, and one is surrounded by a circle of dots. Each has a vulva greatly exaggerated in relative size and represented by a circle with a central dot. There is one representation of the vulva alone ; if taken out of context with the female figures it would probably be interpreted as a flying object. There are six emu tracks, a clutch of eggs and three sets of small parallel curved lines. Only one other engraving of a woman occurs on Main Gallery. It is on Dingo Rock and portrayed in quite different style. (Text Fig. 2, No. 40.)

This rock of the " Little Women " is situated below the base of Main Gallery on the left bank of the bed of Giles Creek. It suggests a dreaming place for human reproduction, or one connected with women's ceremony. The frequency of the emu egg motif suggests that the women may have visited the Main Gallery and participated in some ceremonies with the men. In any case, they probably drew water at the site of this rock. Millstones and mullers, mortars and pestles were collected on camp-sites along both sides of Giles Creek and at the base of the rocky slopes of the valley to within a furlong of the Main Gallery. These are used by women among all Aboriginal tribes, so it can be assumed these camps were occupied by mixed groups.

The fourth photograph shows the vertical rock face in a creek valley engraved with nine examples of barred, hollow-bodied men. One is wearing a ritual head-dress. Boomerangs singly and in pairs are engraved on the same rock face. Only three other instances of the hollow-bodied barred man (Pl. XXIII, No. 8, Pl. XXII, No. 6, and Text Fig 2, No. 33) occur on the Main Gallery.

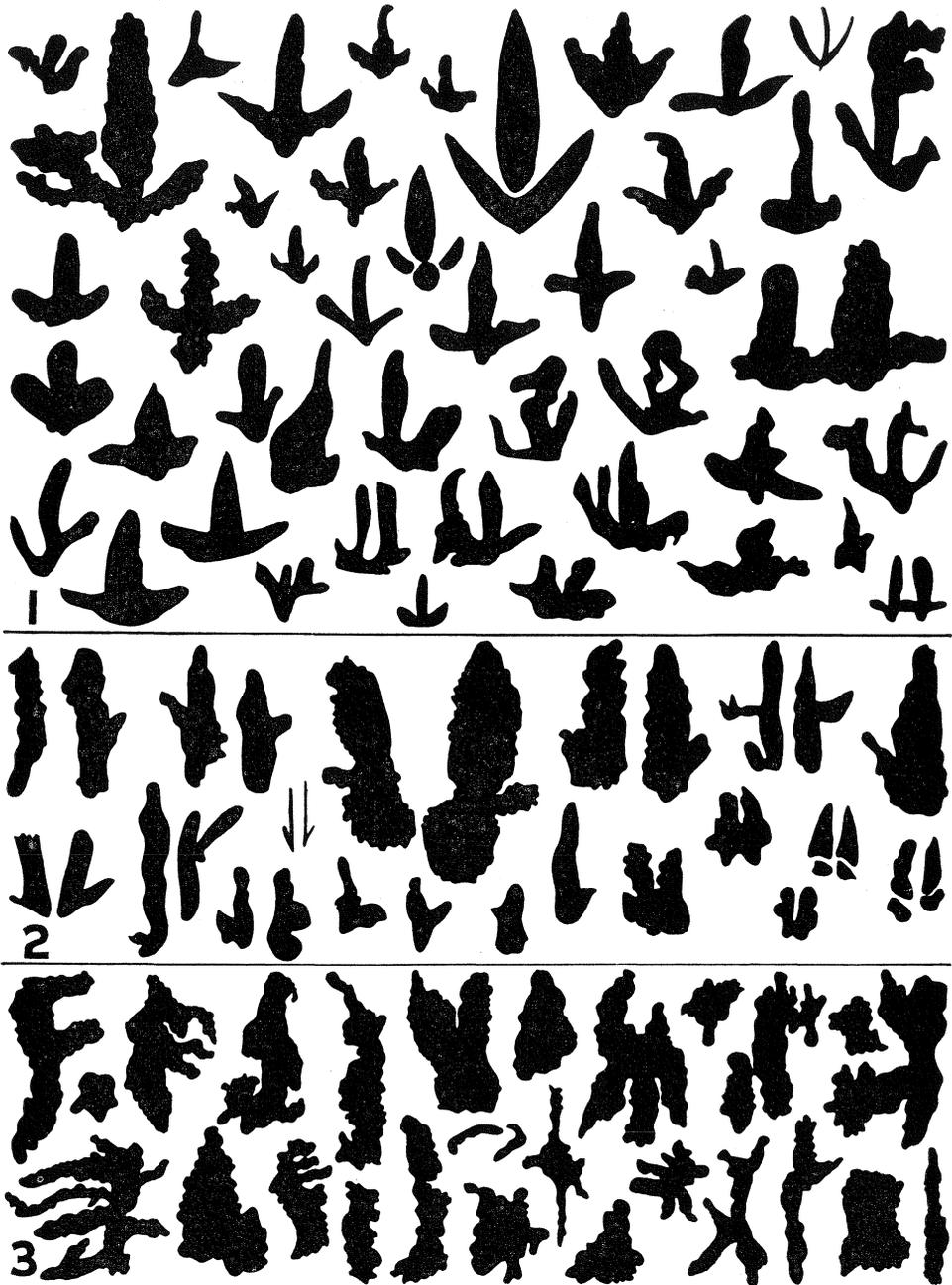
The fifth photograph shows an isolated rock at the south-eastern base of Main Gallery. Its surface bears innumerable engravings consisting solely of a complex design of tracks, including large and small kangaroo or wallaby, fore and hind limbs, goanna, emu and other birds and probably snake and insect. Our informant, Mr. George Dutton, identified this rock as portraying an incident from the Eaglehawk-Crow myth in which the crow, having killed the hawk's son, then set to work making a maze of tracks to deceive and foil the hawk which was out hunting. When the hawk came along he was completely baffled by these tracks and failed to catch any game. This set the scene for a further series of incidents in which the hawk was killed by the crow but revived by the spider. The crow was subsequently buried but escaped from the grave, only to be trapped in a burning shelter from which he also escaped burnt black.

In contrast with Plate XX, which illustrates a massed composition of several motifs on one particular area of rock, and with Plate XXI, which illustrates the repetitive engraving of a single motif on isolated rocks geographically widely dispersed from the others, Plates XXII and XXIII illustrate the repetition of a particular motif throughout the entire Main Gallery and beyond it. Plate XXII illustrates the dominant frequency of the emu egg motif ; Plate XXIII indicates the less frequent but still very prominent kangaroo motif and also some styles of human portrayal and weapons.

In further contrast, Plate XXIV shows motifs which are scarce at Mootwingee and occur sporadically through the galleries.

### Subjects

*Compositions* : It is uncertain whether a mixed series of figures represents a composition or just an accumulation of odd figures on a favourable rock. Crowding of a rock with a preponderance of similar combinations, as in " Dingo Rock " (Plate XX), makes a composition seem more likely. But real difficulty in interpretation is presented by a rock (Plate XXV, No. 1) which has been photographed more often than any other engraved surface at Mootwingee ; it bears an assortment of boomerangs, a pair of kangaroo tracks as big as a little man beside them, a comparatively big lizard, a clutch of eggs and other figures. This may or may not have been a grouping in the eyes of the artist, but the figures, which are in the same technique and state of



Text Fig. 4—The full range of variation of (1) emu tracks: (2) kangaroo tracks: and (3) shapes. Note particularly the emu track (3rd line, centre) with the heel pad and three toes clearly separated and that it is smaller in size than many others not so portrayed.

preservation, are so carefully placed beside one another that a composition illustrating a legend is strongly suggested. The crossing of the large and perfectly represented tracks of kangaroos and emus (Pl. XXV, No. 2) may represent a favourite hunting ground where the animals are always to be found—a popular theme in Arnhem Land art. Further simple compositions may illustrate rites conducted at Mootwingee as well as hunting activities carried out in daily life. A major proportion, at least 20, are concerned with the emu, its eggs and its tracks. Fourteen of these are shown in Plate XXII. From above down in three columns from left to right are seen: Two armed hunters beside an enclosed nest; a hunter, two clutches, two circles (tailed), three emu tracks crossing one of the circles; a hunter in the middle of four nests; two men fighting beside a nest; two boomerangs and two tracks between two clutches; four men (one barred) grouped round a boomerang, two tracks and three clutches; an unarmed man, a clutch, two crosses, a half-barred semi-circle and barbed line; three scattered boomerangs, a tiny headless emu beside its nest, two additional clutches, three shanks and two lizards; two clutches of eggs and three tracks; one clutch between two large emu tracks with another nearby, indicating by the position of the tracks that the bird is nesting; a clutch within a rough circle; an emu rearranging one of three clutches, some scattered eggs and a boomerang nearby which may have been thrown at the bird; an emu sitting on its clutch; a large emu inspecting a nest. On "Dingo Rock" (Plate XX and Text Fig. 2, No. 18) chicks are shown with an emu. Near the apex of the gallery are two emu hunts; other rocks display up to six sets of emu eggs. These main compositions are not repeated, but throughout the gallery occur emu tracks and emu eggs; it is rare for any engraved rock not to include an emu pad. Although there are not many figures of the actual bird, it is significant that four are rearranging clutches, one is sitting on a clutch, two are standing beside clutches, one is inspecting a clutch. These compositions, plus the relation of emu tracks and clutch, establish that the innumerable clutches, some presenting up to 21 eggs to a clutch, scattered widely through the Main and Ancient Galleries and on isolated outcrops, belong mainly to the emu. It cannot be claimed with certainty that all clutches are emu, as sets occur in company with goanna or lizard and perhaps a flying bird (Pl. XXII., Nos. 8 and 12), but this is a unique combination at Mootwingee and more probably represents emu eggs figuring in an additional episode, e.g., as the objectives of a marauding goanna.

Other simple compositions feature a boomerang thrown at a kangaroo, a kangaroo speared in the back, four armed men beside kangaroo tracks; a kangaroo hunt is also indicated by a boomerang and two forepaw tracks and by an armed man and a boomerang beside two hind tracks (all in Pl. XXIII). A common feature of Aboriginal art is the representation of hunting incidents by eliminating the naturalistic figures of hunter and animal and simply depicting the weapons of the hunter and/or the tracks of hunter and animal.

*Human*: The men include the stick type either singly or in small groups (Pl. XXIII.), also round-bodied and heavy-bodied human types (Text Fig. 3). They are shown from the front with rounded and peaked heads, the neck not defined, and the arms usually horizontal. Fingers or toes are very rarely indicated, and the penis in about 20 per cent. of cases. There is no absolute standardisation of type as with the painted Mimi of western Arnhem Land. Many of the men hold one to three boomerangs in either or both hands. Some carry a spear with three or four barbs on one side and a spearthrower, and one little man is carrying both spear and boomerang. Several unusual figures merit comment. One is a stick-type man carrying a club or spearthrower from the bottom of which a long curved line extends below the figure. Another is the hollow-bodied barred type already described (Plate XXI). In cave 4 (Text Fig. 7, top right) is a man standing on one leg, a figure unique in Australian rock art. Although crudely made in the coarse wall, it has a grace of posture unusual in Mootwingee art.

The largest unarmed human figure, almost 1 ft. high, is depicted in a simple rounded style which tends towards a conical form from feet to head (Pl. XXIII, No. 11).

*Mammals*: The dominant mammal in the gallery is the kangaroo, of which there are four comparatively large figures from 2 ft. to 6 ft. long, and three smaller ones from 8 in. to 1 ft. long (Plate XXIII). In the intaglio figures, the smallest one lacks tail and hind legs but has large forepaws; one has very big hindlegs and no forelegs; one has a curious lumpy extension of its forelegs; one has a very thick tail and ill-defined forelegs; and one is well proportioned and in a hopping posture. The largest figure of a kangaroo (Pl. XXIII., No. 3) is engraved on a long low spur on the eastern side of Big Cave Creek (see map). It is just over a furlong from Nootambulla Creek. This kangaroo has a heavily pecked outline and a pattern of lines on the forepart of its body; the whole of the tail is pecked into a full intaglio; the body is only lightly pitted here and there. It may have been the intention of the artist to peck the body all over; alternatively, it is an old figure which another artist began to make into a full intaglio in a later generation. This kangaroo has one short and one long hind limb, three and six digits on the forelegs, and a pointed nose. The pose is a static one, although the animal is standing in the halfway-up posture characteristic of kangaroos. Part of the rock has broken away, leaving incomplete the posterior part of the figure.



Text Fig. 5—1. Emu egg motifs, up to 3 ft. long: 2. Outline and linear designs, up to 2 ft. long.

Two of the mammal figures are difficult to identify. Both are probably bandicoots, of which they are, however, unusually large representations, 3 ft. and 4 ft. 4 in. Another pair of small mammals (Pl. XXIII) may be bandicoots, wombats or native cats, and a small figure 15 in. long, with a short tail, is probably a possum. Three toes are commonly shown on the mammals. A series of 16 dingoes (sic) is described in the section dealing with Dingo Rock.

*Birds* : The emu is practically the only bird in the engravings and has been fully described under Compositions.

*Reptiles* : The only engravings of snakes are the two on Dingo Rock. Several engravings of lizards were found. Two in the main gallery are simple linear figures (Pl. XXII, No. 8) lacking digits. One of them is posed beside a set of eggs. The nest may be its own, but as the other lizard is surrounded by 20 emu tracks the nest may be an emu's. A short broad species of lizard like a gecko, and a goanna, are depicted in the main gallery, and the shelly-backed lizard, a short, thick and scaly type, is shown in a now patinated and waterworn figure in the bed of Big Cave Creek, near the first pothole at the base of the long slope leading up to the cave. Barrett (1929) referred to tortoises; we could find no such engravings, although the habitat of the tortoise (*Chelodina*) includes this region.

*Fish* : There are no actual fish engravings, but two tailed circles, which might possibly have been derived originally from the stingray motif, and broad double semi-circular designs (Pl. XXIV, No. 14) which represent the stingray's liver in northern Australian rock art, constitute unusually interesting motifs at Mootwingee. Note, however, that Dutton identified one of these double-tailed circles as a rain-making rock-hole. These identifications will be discussed further under Affinities.

*Tracks* : Three kinds of tracks are represented, the human, emu and kangaroo. The full range of variation is shown (Text Fig. 4). The human tracks are full intaglios in different sizes, occurring only on Dingo Rock. It is impossible to distinguish between the tracks of the kangaroo, euro and wallaby, and most of them will be referred to as kangaroo in this paper. In one instance the forepaws and tail (the hind foot tracks have broken away on the side of a fissure) are shown as a unit, a motif not previously recorded as an engraving in the interior of Australia but a common one in north-western Australia. McCarthy in 1958 recorded many examples of it at Port Hedland (Manuscript) and on Depuch Island (1961). Some of the double tracks represent either the emu or kangaroo. There are both thin linear and thick broad intaglio engravings of both kinds of tracks. These tracks occur singly, in pairs, in lines, in groups, intermixed, and frequently as part of compositions. They are to be seen in large numbers throughout the entire gallery.

*Plants* : There are two engravings of a plant bearing rounded fruits, berries or nuts. One of them (Pl. XXIV, No. 1) occurs at the base of the rock slope leading up to the Big Cave from the creek below it. It has 19 pecked spheres on a vine-like plant. Another similar design (Pl. XXIV, No. 6) in the main gallery has fruits or berries on the ends of straight stalks attached to a sinuous central stem. The crop from these plants, which may be the kangaroo berry, was probably gathered by the women. One design (Pl. XXIV, No. 4) resembles the grass-tree.

*Material Culture* : The boomerang is the only weapon engraved separately. Spear, spearthrower and club are not engraved separately but are held by men. The boomerangs include a long slender type, probably the tooled mulga type (McCarthy, 1957, p. 78, fig. 1) typical of western New South Wales. There is also a broad type of medium length. The boomerang is shown singly, and in vertical sets of two, three and four (Text Fig. 6). An oval barred figure (Text Fig. 7) may represent a sacred board or shield. The spears bear from one to four barbs in a single row. Davidson (1934, Figs. 2, 10) recorded the use of plain-headed spears, and spears armed with one row of barbs, on the Darling River, and it is obvious that the latter type was used as far north at Mootwingee at least. The type of spearthrower is not clearly defined, as it is carried by tiny figures of men and is usually shown as a simple stroke or crescent (Text Fig. 3). Two engravings resemble a windbreak, one occupied by three adults and a child or dog, the other by two adults lying in the shelter (Text Fig. 3, No. 4).

Four small figures appear to represent the feather plume ornaments made by binding and gumming the feathers of cockatoos or other birds on to a spike which is thrust in the hair or through an armband. (Text Fig. 3, No. 5.)

*Circles* : Such motifs are scarce at Mootwingee, and tend rather to oval shape. Only one thin outline circle, and several tailed circles were found. Within the outline of some ovals are engraved a kangaroo fore track (Pl. XXIV), a pair of kangaroo hind tracks in fine line (Text Fig. 5), a full intaglio emu track (Pl. XXII, No. 2) which may be fortuitous, a clutch of emu eggs (Pl. IV, No. 11), a pair of dots (Pl. XXIV, No. 15), while one has a short line at one end, one band from one side to the other, and two have tails (Pls. XXI and XXIV).



Text Fig 6—1. Artefacts. 2. Cave paintings, various sites. 3. Pecked designs. Figures from 3 to 18 inches long.

The ovals occur singly, in pairs and in threes. There is only one example of a concentric circle, which has a conical projection like the handle of a ceremonial object. Pulleine (1926, 180) said he saw a faint spiral on the vertical rock face, but we did not find it.

*Radiate* : Four splendid radiate figures were found, three of them in the main gallery and one among a smaller patch of figures a quarter of a mile to the south-east. The largest one (Pl. XXIV, No. 7) has 17 rays, most of which have a rounded knob, and one an emu track, at the end, and the design appears to be connected in some way with this bird. It is tempting to think that each knob represents an egg or nest, but there are so many other possible meanings, including sacred rites, waterholes or camps, that any interpretation is problematical. Other smaller examples of this design have seven knobbed rays and one plain but bent ray (Pl. XXIV, now in the Australian Museum), six knobbed and two plain rays (Pl. XXIV, No. 9) and two knobbed and six plain rays (Pl. XXIV, No. 8).

*Designs* : Many of the linear figures and complex designs can neither be adequately described nor interpreted. Among them the two crosses and the set of parallel lines are the only widespread motifs in Australian rock art. There is a limited number of designs in both the linear and pecked band styles, and many of the latter are unique to Mootwingee. The presence of unique local designs appears to be characteristic of pecked-engraving sites generally.

*Irregular Shapes* : (Text Fig. 4). Scattered throughout the site, and often forming part of compositions, is a large number of irregular shaped intaglios which appear at first sight to be attempts by novices to make an engraving. They seem to be completed figures which represent ridges, hills, lakes and other features of the landscape mentioned in the legends. They occur in other sites of pecked engravings, but have not previously been noted or recorded.

## DINGO ROCK

(Plate XX and Text Fig. 2)

*Description of the Rock* : This rock is located half way up the south-eastern margin of Main Gallery, above the ravine of a tributary of Giles' Creek. It is a slab of sandstone isolated from neighbouring slabs by 1.0 metre deep crevices which vary in width from 0.3 to 1.5 metres. It appears to be resting, like its neighbours, on an unfractured substratum of sandstone and in a plane approximately 20° from the horizontal. It is uniformly 1 metre thick. Stratification layers varying from 10 to 20 cms. in thickness can be seen in its western lateral or fracture faces, and testify to its sedimentary origin. Its eastern lateral faces are more rounded and matured by weathering. It is rhomboidal in shape, the longitudinal axis bearing 40° measures 5.0 metres, and the transverse axis 3.7 metres. Each side measures approximately 3 metres.

Superimposed on the north-western quarter of its surface is a square block of sandstone, each side measuring 1.25 metres. Its maximum thickness is 1 metre. Lamination is very obvious, and fracture through one of these layers has shed half the block to a depth of 0.5 metre. By calculation, the block weighs approximately 750 kilograms. Two irregular slabs derived from this fractured block lie end-on in the crevice bounding the south-western margin of Dingo Rock. The surface of Dingo Rock immediately adjacent to the south-eastern margin of the block is shattered over an area measuring 10 by 50 cms.; a layer 15 cms. thick has flaked off, carrying away portion of the most elaborate engraving on the rock. It can be assumed this damage was caused by the two irregular slabs when they broke off from the fractured block.

The block is not resting directly on the surface of Dingo Rock. Intervening are six separate squarish slabs 20 to 40 cms. in width and 30 cms. in thickness. The space separating the superimposed block from the underlying surface varies from 15 to 35 cms. and it is possible to insert the full length of an arm most of the way round, under the margins of the block.

The surface thus sheltered feels smoother, less granular, has very few surface fissures, and pecked engravings can be detected by touch on this hidden surface. Their pits can be seen by a torch beam, but what they portray cannot be determined from such an oblique angle of vision.

The superimposed block has rolled, presumably by torrential flood, down the hillside into its present position after the engravings had been completed, and the event was sufficiently long ago for the surface of Dingo Rock to have developed a differential texture in the protected and the exposed regions.

This is strong evidence for the antiquity of the engravings on Dingo Rock, evidence of a kind not observed elsewhere on Main Gallery.



Text Fig. 7—Engravings from various rock shelters. The figures in No 1 are up to 2 ft. long, and the sets of figures in Nos. 2-9 are several feet long.

A luxuriant beefwood tree grows in the crevice at the south-eastern margin and provides a light cover of fallen leaves over the south-eastern quarter of the surface of Dingo Rock. The surface here is blackened and has a very granular weathered texture, and Plate XX shows the striking contrast of this blackened area with the lighter colour of the more western portion of the surface. As the blackening affects the surface only to a depth of one centimetre, the interior of the rock being a light yellowish-grey, it is apparently due to vegetable staining from the shed leaves of the present tree and, presumably, of predecessor trees. The soil in this crevice is a dark loam quite different from disintegrating sandstone and indicates a long period of accumulation of vegetable mould.

The engraved surface is subdivided by fissure fractures into rhomboidal, triangular, square or hexagonal plaques. The fissures vary from 0.5 to 3.0 cms. in width. They are more frequent on the eastern blackened portion and near the apex of the rock, less frequent on the western portion and, as already mentioned, almost absent on the area under the superimposed boulder. The individual lines of fissure fracture number well over 500 and define approximately 200 surface plaques.

In 69 instances these fissures transect engraved figures and in eight instances have resulted in scaling or shedding of an appreciable portion of the figure, in two cases the upper half of a man, in one case the lower half, in one case part of a head, and in four cases most of a boomerang or spear or the hand carrying it. In five cases the distal part of a leg or foot or hand has been carried by the fracture out of alignment with the limb. There are only 15 figures centrally situated within a fissure-surrounded plaque, but in nine of these a pecked connecting line to another group is transected.

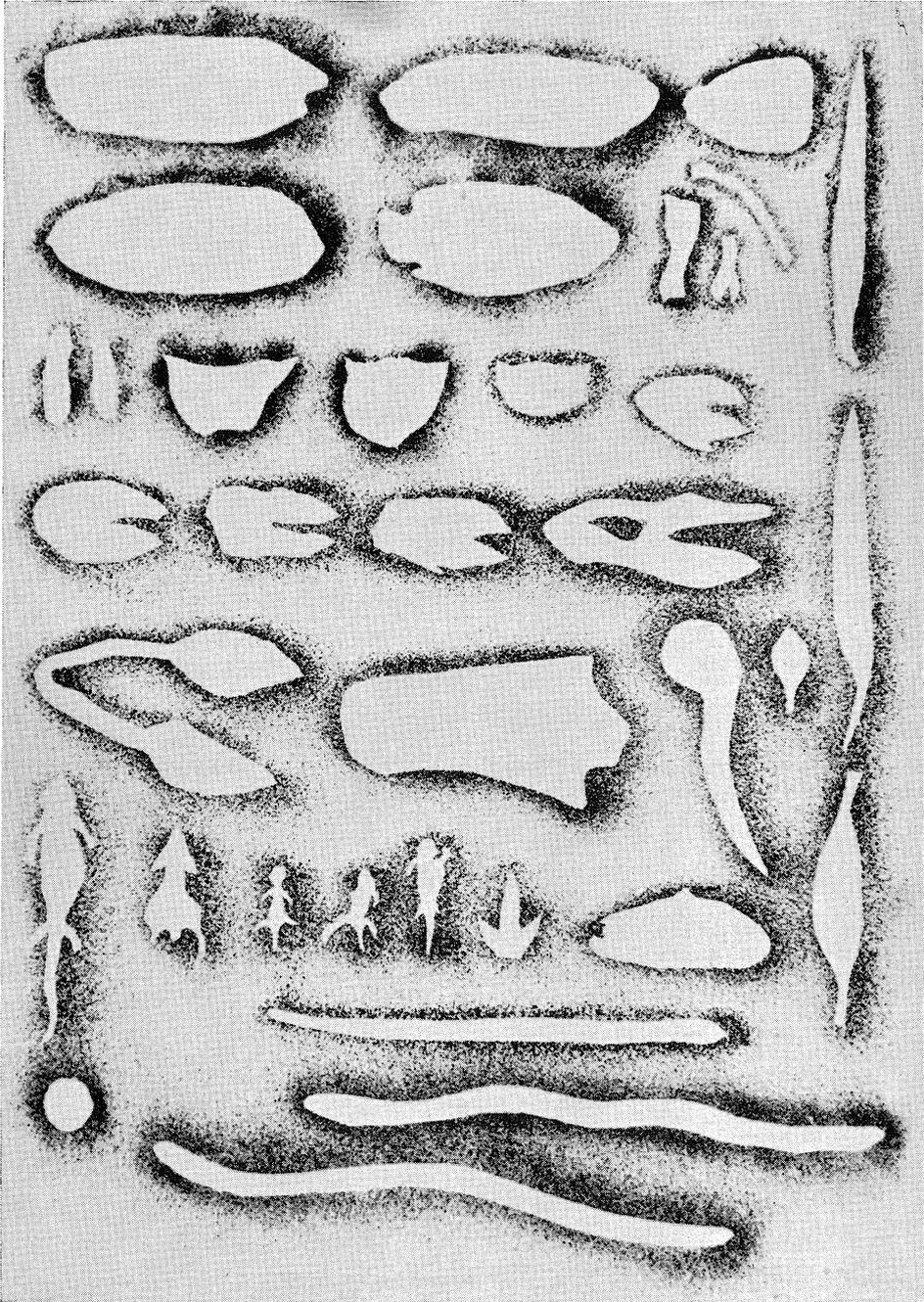
Further evidence against post-fissure engraving is the impartial occurrence of the fractures ; the largest and most elaborate figures and the smallest and least pretentious are equally victims. An elaborately decorated Hero (sic) has lost the lower half of his body ; fractures traverse his head-dress, thorax, right arm and one of the mammals beside him. A large banded emu has its beak separated from its body. But also 11 small simple emu tracks are transected. No artist would engrave such a small figure across a fracture, when a change of position of 6 or 7 cms. would provide an intact surface. A further point is that the frequency of engraved figures is highest towards the south-eastern blackened rock surface which also presents the highest frequency of fracture lines ; the less fractured western surface bears fewer engravings. The reverse would be expected if the engravings had post-dated the fracturing.

Plate XX illustrates only the motifs on the lower two-thirds of Dingo Rock, plus similar ones on adjacent surfaces. But on the northern quarter of the surface of Dingo Rock near its apex are sparse engravings representing three clutches of emu eggs, a few emu tracks and two lines of very small dancing men (see Plate XXIII, No. 10, and Text Fig. 2, Nos. 139-153). These motifs are almost certainly to be associated with the emu (Plate XXII, No. 14) on the adjacent rock beyond the fissure which separates it from the apex of Dingo Rock. Below this sparsely engraved area is a blank band of surface area 0.6 x 2 metres in extent. Further south, or inferiorly, the remaining two-thirds of the surface is packed with engravings, prominent among which are decorated or armed men with dog-like animals at their sides. South-west of Dingo Rock on adjacent rock surfaces, but separated from Dingo Rock by its marginal fracture, are two more examples of this motif of decorated or armed men with dog-like mammals (Pl. XX, Nos. 3, 4). In the entire Mootwingee area there are only two other examples which simulate this motif ; they occur in Cave 16, some six miles to the south of Main Gallery (see map).

The sterile area of surface separating the upper and lower compositions indicates that the two series were originally carved on localised areas of an unbroken surface, their separateness of theme being indicated by the intervening sterile strip. This disruption of the figure combinations of two separate compositions is evidence that the engraving preceded also the major fracturing of the rock gallery into slabs.

In summary, there is very strong, and, the writer thinks, conclusive, evidence that the Dingo Rock engravings pre-date (1) the massive fracturing of the sandstone slope into rhomboidal slabs, (2) the widening of the fracture sufficient to permit accommodation for growth of a large tree, (3) the less dramatic fissuring of the surface lamina into rhomboidal plaques, (4) the superimposition of a flood-borne boulder, and (5) the differential weathering and blackening of the engraved surface.

If the length of time necessary to consummate these events of nature was known, a date following the termination of the engraving period could be stated. It is not known, but the most conservative or minimal guess could hardly suggest less than 300 to 600 years, with the possibility that the figure is higher. Hence, the making of the engravings on this rock must have ceased long before the advent of the European.



Text Fig. 8—Stencils of coolamons, lizards, snakes, club, and various unidentifiable objects. Their dimensions are given in the text.

The frequency of fissures in the surface lamina of Dingo Rock is higher than on any other engraved surface in the Main Gallery, but the width of the crevices isolating it as a slab is exceeded in other parts of the Gallery. The surface lamina has a more leached and granular appearance and the actual engravings are more weathered, having less sharply defined edges, than in the larger proportion of other engraved surfaces in the Gallery. Compare, for example, the fresher appearance of rock and engravings in Plates XXI and XXV.

A few examples of barred, banded and incomplete intaglio within a heavily pecked outline occur on Dingo Rock. It is not yet clear whether these are late subsections of a linear phase or early subsections of a full intaglio phase.

While the total engravings of the Main Gallery apparently encompass a considerable period of time, it would seem, all data considered, that the engravings on Dingo Rock were made near the early middle rather than the late limit of that time range.

*Some calculations on hypothetical bases* : Three hundred and four items are engraved on what has been arbitrarily defined as Dingo Rock. These were chalked in as an aid to identification and to photography. The chalking consumed 14 hours. Recording of the total items in a field survey drawing to scale took eight hours. Using a planimeter on this drawing, it was calculated that the total actually pecked area on Dingo Rock is 1.8 metres, squared.

Using transparent paper, 12 of the dingoes (sic) and the decorated Hero (sic) were traced in outline only. This took two hours. By calculation, tracing the total outlines would have taken 26 hours, some 260 items being smaller than the dingoes.

Three of the dingoes were traced again, each individual peck mark being traced as well as the outline. (This was to assess the range of shapes and sizes of the punctures and gashes.) This took two hours. By calculation, the total group would have involved 100 hours. Many of the peck marks are superimpositions over two or more preliminary layers of pecking ; presumably, if they could all be traced, a factor of x 2.5 would involve 250 hours.

The drawing of Text Fig. 2 by the extraction and re-grouping of motifs from Plate XX took 24 hours, i.e., almost twice as long as chalking in the rock and three times as long as making the field survey copy.

If it is assumed therefore that in making the engravings, the planning, draughtsmanship and design involve a minimal time factor of x 2.5 and that pecking on rock rather than tracing on paper involves a minimal time factor of x 5, then the minimum time to engrave the total figures on Dingo Rock would be  $250 \times 2.5 \times 5 = 3,125$  hours.

It is doubtful if the total items on Main Gallery could be systematically and accurately counted. At the most conservative guess there must be 2,500. (Track Rock alone has approximately 600 engraved items.) By calculation, the total engravings on Main Gallery therefore represent some 25,000 man-hours.

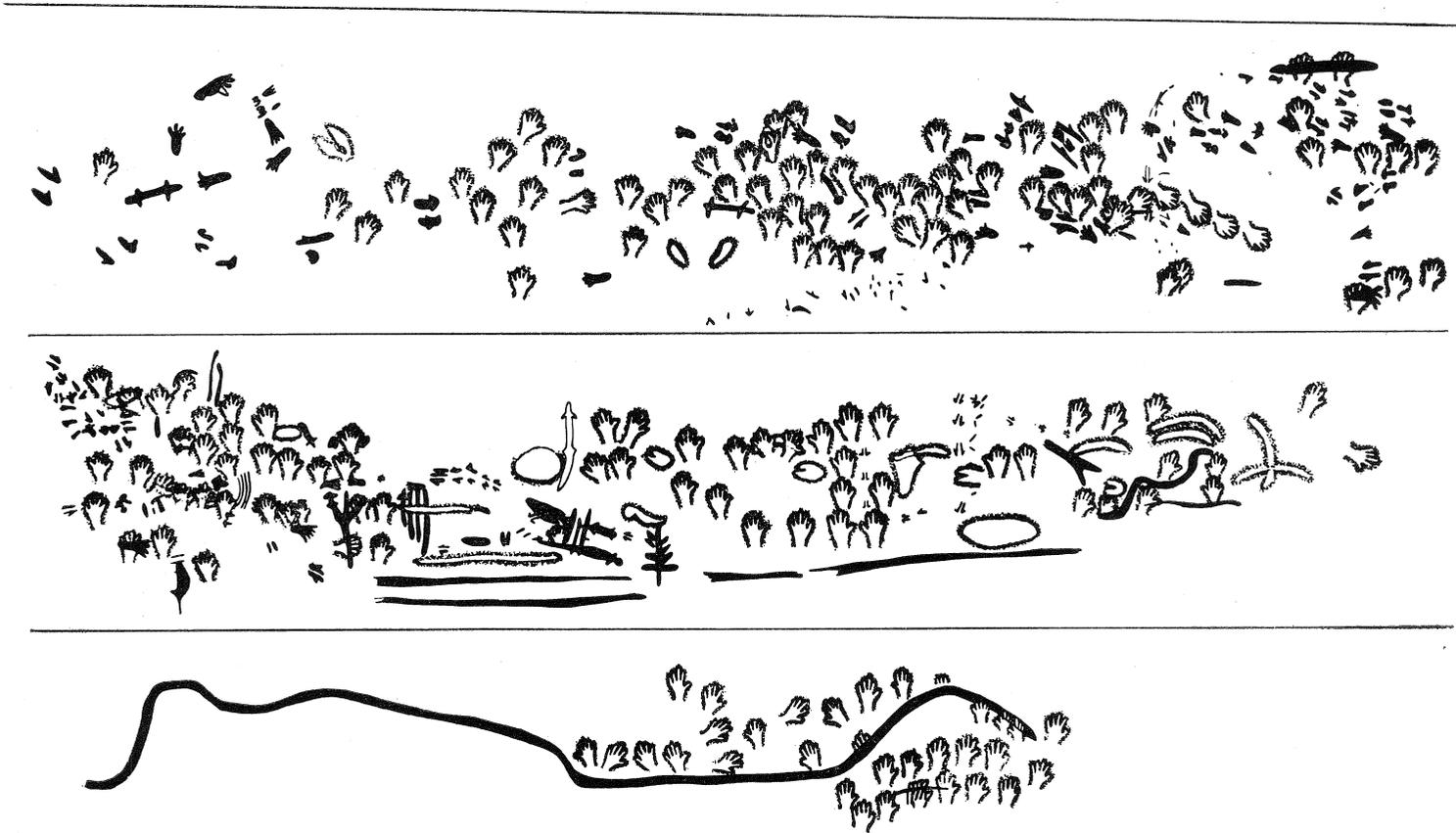
As mentioned elsewhere in this paper, apparently the population was numerically small ; but assuming that the making of additional new engravings was a necessary role in annual ceremonies, and therefore assuming that each year 100 man-hours were devoted to engravings, then the total gallery could have been created over a period of 250 years or some 10 generations. Such persistent zeal seems idealistic. Allowing for "stand-still" periods or the likelihood that existing engravings were re-pecked or simply remained ceremonially adequate for periods of time before additional motifs were needed, then this 250 years might logically need a factor of x 4 or x 5, giving 1,000 to 1,250 years to engrave Main Gallery.

It is difficult to imagine further extending time factors. Long nomadic absence from the sites might risk loss of the engraving technique. Something of that nature may be an explanation for the complete disappearance of knowledge of how the engravings were made.

The Ancient Gallery near Big Cave obviously pre-dates Main Gallery. Comparable figures to the calculations already made would need to be added to assess the beginning and duration of the total (ancient and more recent) engraving at Mootwingee.

Tentative Table Derived from Calculations on Hypothetical Bases  
from a Study of Dingo Rock

	Minimal	Maximal
Time of cessation of engraving on Dingo Rock .. .. .	300 B.P.	1,000 B.P.
Period of time occupied in making engravings at Main Gallery ..	250	1250
Time of commencement at Main Gallery .. .. .	550 B.P.	2250 B.P.
Time of commencement at Ancient Gallery at Mootwingee ..	800 B.P.	3500 B.P.



Text Fig. 9—Stencils and paintings in Big Cave. The snake is 30 feet long.

All calculations employed in this attempt at extrapolation have been aimed at assessment of minimal time. The figures could be over-estimations, but are more likely to be under-estimations.

Factually, it is not known how these engravings were made nor with what, let alone the Aboriginal craftsman's rate of performance ; so the figures calculated above on hypothetical bases may be grossly astray, but they do give some crude evaluation of time involved. It is better to consider hypothetical figures derived from practical considerations, than " stab guesses " ranging from 100 to 10,000 years.

One point is clear : a food hunting community in this region could ill afford such expenditure of energy and man-hours in mere diversion ; engravings must have represented considerable significance to welfare in the population's philosophy.

#### CENSUS OF SUBJECTS ON DINGO ROCK

Dingo .. .. .	16
Emu .. .. .	4
Emu chick .. .. .	2
? Weather-break .. .. .	1
Crested Cockatoo .. .. .	1
? Emu ? boomerang ? bull-roarer .. .. .	2
Unidentified .. .. .	8
Goanna .. .. .	1
Snake .. .. .	2
Wallaby .. .. .	1

#### Humanoid Male :—

Ornately decorated .. .. .	1
Decorated head-dress and armed .. .. .	5
Heavily armed and some decoration .. .. .	5
Armed but small .. .. .	4
Undecorated but armed (large) .. .. .	1
Undecorated and unarmed (large), fractured .. .. .	1
Unarmed (very small) .. .. .	1
Barred .. .. .	1
Humanoid Female .. .. .	1
? Tree or ? Interconnecting Intaglio Design .. .. .	1
Boomerangs (separate) .. .. .	4

#### Objects held or worn by men :—

Elaborate head-dress .. .. .	1
Ceremonial object (some attached to weapons) .. .. .	7
Boomerang .. .. .	22
Spear .. .. .	1
Spear thrower .. .. .	3
Club .. .. .	1
? Hand axe .. .. .	2

#### Emu egg :—

Clutch—four with total small spheres numbering .. .. .	35
Isolated small sphere (egg) .. .. .	86

#### Tracks :—

Emu .. .. .	48
Wallaby hind .. .. .	13
Wallaby fore .. .. .	4
Human hand .. .. .	2
Human feet .. .. .	16

Total : 304

*Description of subjects as a whole* : Plate XX, No. 1., shows the subjects in their correct spatial relationship and with a relatively uniform scale for all. It is a composite picture and involved much difficulty in manufacture. The obliquity of the rock makes it impossible to photograph the entire surface in one frame without distortion to the shape and size of the subjects. A series of photographs of sections of the rock were therefore cut, and enlarged or reduced progressively until they pieced together as a unified whole. The fissure fractures of the rock surface provided a controlling guide in this piecemeal reconstruction which involved the making of some 80 new negatives from the original sectioned photographs. The final result was the product of the technical skill and patience of Mr. G. Williams, of the Department of Anatomy, University of Sydney.

The census table indicates the range and frequency of subjects.

There are some unique features—unique, that is, for Mootwingee. Decorated and armed men accompanied by dingoes (sic) predominate and, to a lesser degree, the omnipresent emu with its tracks and eggs. The majority of the men are in ritual or ceremonial attire or posture. There are extremely few similar figures on other sections of the Mootwingee galleries and none comparable to the Cult Hero (sic) with his elaborate head-dress and decorations. It is the only example of a group in which one predominant Hero is associated with other men similarly posed and illustrating a similar theme, but in whom the elaborateness of head-dress and decoration is progressively reduced. It suggests an aggregation of all grades of ritual status from Hero down through lesser Heroes, full initiates and finally novitiates.

There is a suggestion of ornateness about practically all the subjects, which is not found elsewhere at Mootwingee. The position of the rock overlooking a ravine adds to the impression of drama in this composition.

The only two snakes found among the engravings are here.

Apart from the rock of the little women, the woman on this rock (in a different form of depiction) is the only female representation in the engravings.

It is only on this rock that human hands and feet occur.

Two of the men, one metre apart, are linked together by an elaborate and extensive intagliated pattern which George Dutton says is a tree. This is also unique at Mootwingee.

The combination of variety plus high frequency of individual figures is unequalled in the gallery. Track Rock bears many more figures, but they are all tracks.

Representation of dog in Australian rock engravings is uncommon. Here there appear to be 16 in a circumscribed composition.

Plate XX, Fig. 1, looked at as a picture, gives the impression that the Cult Hero in a magnificent head-dress and with two dingoes standing on his sides is presiding (at the top left-hand corner) over the scene. Flanking him to his left side, a series of heavily-armed men have defined but not elaborate headgear and decorated boomerangs and dingoes. Somewhat lower the motif of armed men with dingoes is repeated, but the decorations are absent and the emu motif appears and becomes predominant. At the right lower margin of the rock the decorative element re-appears in the two men linked by the tree design. A huge boomerang and a large coiled snake make a striking centre-piece. The solitary woman in the top right margin seems curiously detached from all this welter of subjects, and so does a solitary dingo below her.

This change of motif across the rock surface is not abrupt; there is a gradual and subtle intermingling of possibly three or four separate themes, so that it looks like a story in panorama of tribal occupational life. Spiritual and profane activities would seem to be concurrently related.

*Style* : (See Text Fig. 2.) The barred style is represented by No. 33 (hollow-bodied barred man), No. 34 (barred head of the Cult Hero), No. 44 (man's barred head).

The broad intaglio band style is represented by No. 21 (? weather break). Also in the series of figures Nos. 139-153, which is not regarded as part of the Dingo Rock composition, No. 142 shows two bands within a semi-circle from which extend two projecting bands; superimposed over one of these is a fully pecked emu track.

Figures outlined by a deeply intagliated groove, with intagliated bands across the body and with partial regional inpecking varying from light to medium, are represented by No. 17 (emu) and No. 22 (cockatoo).

A tiny man (No. 45) is similar in style to Nos. 144-153. This No. 45 gives the impression of "not belonging" to the Dingo Rock composition, but there is no means of saying whether it was engraved before or after the main series.

Two other figures of men, Nos. 47 and 48, while much larger than the tiny men just mentioned, are nevertheless very stick-like in style (see also Pl. XX, No. 3).

All the remaining figures on Dingo Rock are engraved in the fully pecked intaglio style.

The outline in most cases is irregular, in several cases extremely so. It suggests inaccuracy such as might derive from freehand percussion blows. It has given a woolly appearance to some of the dingoes (sic) and will be discussed further on.

*Oddities in motif* : (See Text Fig. 2). In No. 18, the head of the emu has the shape of an emu track. The legs of this same emu are indicated by a single line and this line is also representing the arm of the man in No. 42.

Incorporated into the tree pattern between Nos. 41 and 42 are three emu tracks which incidentally lend some impression of foliage to the pattern, provided one accepts identification of the pattern as a tree.

In three cases—No. 34 (Hero), No. 36 (heavily armed, smallish, thick-bodied man) and No. 47 (stick man)—the head is pecked in outline only. Also in Nos. 43 and 44 (elongated and somewhat ornate men) pecking is absent within the head and neck outline. In No. 44 it appears to be deliberate, in No. 43 it could be accidental. This "hole in the head" appearance occurs in paintings of stick men in caves at Wuttagoona, north of Cobar (unrecorded). This might indicate affiliation of motif in engraving and painting at these sites.

The more-or-less circular dots have already been shown to represent emu eggs, certainly when they occur in clusters (Plate XXII), with the possibility that other bird or goanna eggs may be represented. Emu eggs may therefore be represented by the isolated dots. While dots are recorded from eastern Australia and the Lower Murray, it is not implied that in those sites the dots also represent emu eggs. It is necessary to remember that Breuil and others have recorded the dot motif painted and engraved in Europe. At Mootwingee, on Dingo Rock, random dots occur in large numbers; furthermore, while the cluster in No. 19 is obviously an emu clutch, another cluster of smaller dots in No. 21 presents a problem in identification. If the main figure is an emu, the dots obviously represent a clutch of eggs. But our informant, Mr. George Dutton, says the main figure is not an emu, but is the weather-break where the two wives in the Eaglehawk and Crow Myth sheltered. The human footprints are those of the women and of the nephew they were trying to avoid. The cluster of dots, according to Dutton, is a heap of faeces deposited by the women, as in the myth, to hinder the pursuing man. It is to be noted that of the footprints two occur in larger male and four in smaller female size. (The other author, F. D. McC., identified this engraving as a wind-break prior to our discussions with the informant, but thought also that it was sheltering a family and a dog.)

This small composition of figures in No. 21 provides circumstantial evidence for the reliability of Dutton's information that some of the engravings are portrayals of mythology, and for his familiarity with Dingo Rock.

Two items difficult to identify are Nos. 23 and 24. At first sight they look like unfinished engravings of emus. No. 23 could be a misshapen emu, or a boomerang, because there are other boomerangs in the Main Gallery associated with clutches of eggs as is this one. No. 24 could also be an uncompleted emu or a truncated boomerang, but it is only slightly curved and has a cord-like appendage; an identification as a bull-roarer could be made. No. 23 is not an impossible candidate for similar identification.

*Intention of portrayal* : Every figure in the Dingo Rock composition is apparently intended to be a realistic or naturalistic representation. Nevertheless the certain identification of a number of figures is by no means easy and in eight cases is impossible.

*Anatomy and draughtsmanship* : (See Text Fig. 2.) There is an absolute absence of anatomical accuracy. Only two examples approach reasonable truth in proportion and structure. These are an emu apparently trying to pick up an egg with its beak (No. 19), and an emu standing fully erect (No. 20).

In the criterion of anatomical accuracy, most Australian art is bad; the incised pictographs of Djamar (on Tjuringa 6 and 7 figured by Worms, 1950) are exceptions to this statement. At Mootwingee, apart from the two emus mentioned and the emu tracks, the engraved figures are anatomically exceptionally bad.

The human portrayals on Dingo Rock are grotesqueries of caricature. All appendages are grossly shortened relative to total stature. Fingers and toes are very seldom shown. When they are, they may range from two to six per member. Note the star-shaped arrangement of five toes on the left foot of man No. 52, the three-toed right foot in Nos. 37 and 39 and the two-toed right foot in No. 46. Lateral projections at the sides of the head may represent ears and/or part of a head-dress. Head, neck and body are almost amorphous, elbow and knee joints are not indicated. Penis is portrayed in only five of the 19 males. Man No. 49 appears to have two left legs.

Emu No. 17 is similarly distorted, but here the gross shortness of the legs relative to the body is accentuated by the exaggeration of its three-toed feet. Its head is indicated only by its beak. In contrast, emu No. 19 is given no toes at all. No. 22, arbitrarily identified as crested cockatoo, might be a distorted emu or some other bird.

No other living forms in Australia resemble a human being or an emu, hence these should be unmistakable. Yet the problem frequently arises of differentiating, for example, human from lizard in Aboriginal art. It will be necessary to attempt an anatomical analysis of figures Nos. 1-16, Dingoes (sic). The difficulty of the task is highlighted by the distorted portrayals of what should be such unique and unmistakable forms as emu and human, but analysis is helped by taking into consideration the Mootwingee artists' predilection for (1) grossly shortened limbs ; (2) random portrayal or omission of smaller anatomical items, e.g., ears, penis, fingers, toes ; (3) indifference as to number of digits, if they are portrayed.

The surprising thing is that the subjects can be identified at all when so grossly caricatured. It is still more surprising that, seen in context, these figures take on the guise of reality and immediately convey some meaning or story ; this is particularly the case with the Dingo Rock assemblage.

The apparent paradox can only be explained by the very real skill of Aboriginal draughtsmanship, used here to mean capacity to design and arrange subjects sufficiently skilfully as to create the impression of integration and inter-relationship. As in some examples of modern European art, the overt interpretation may not coincide with the story the artist intended to convey.

*Description of Nos. 1-16, Text Fig. 2, Dingoes (sic).* (The subjects in their context can be seen in Pls. XX and XXVII.)

Tourists examining the engravings and people, including pastoralists, to whom photographs and pictures of these subjects have been shown have variously identified one or several or all of them as white man's dog, cat, sheep, cattle, horse, pig, fox, rabbit and as koala and dingo. One of us (F. D. McC.) added the hairy-nosed Wombat to the list, and the other (N. W. G. M.) for good measure mentions *Thylacinus* and *Sarcophilus*. Our informant, George Dutton, at his first inspection of photographs and tracings, called them dogs. He was not interested in a differentiation between dingo and domestic dog ; he said that in stories (legends) like that of Jaru the hunter the animals were just called dogs, but he supposed they were dingoes in those days.

The approach becomes one of elimination.

The sheep has been most frequently suggested because in some of these subjects (Nos. 1-6) the outline is very woolly, no tail or only a rudimentary tail is shown, ears are not depicted and the legs are short. It has already been pointed out that the outline of some of the men, particularly the Hero, No. 34, the large man, No. 38, and the partly destroyed man, No. 39, is equally woolly and that this woolliness of outline is simply due to imprecise alignment of the pecked pits or gashes, probably due to freehand blows with some implement. Lack of tail and ears is an argument of no force whatever, remembering the lack of fingers, toes, penis, ears, neck, joints in the majority of the engravings of men. Shortness of leg is also an argument without force similarly by analogy with the human figures where the legs are disproportionately short to an absurd degree and also by analogy with the legs of the emu in No. 17. It seems irrational, furthermore, to contemplate Aboriginal stockmen, while armed with boomerangs and ritually decorated, tending the white man's sheep.

The fox has been suggested for figures Nos. 8, 13, 14, apparently because brushy tails are represented in these subjects.

Evidence is almost, if not absolutely, conclusive that the cessation of engraving at Mootwingee preceded the advent of the European probably by several centuries. All the white man's animals are thereby excluded.

Koala has apparently been suggested because subject No. 1 appears to be standing on or clinging to the left side of human No. 31, and subjects Nos. 2 and 3 similarly to the left and right sides of the Hero No. 34. Subjects No. 4 and No. 12, however, while under the left arm in each of humans No. 52 and No. 49, have their backs towards the sides of the human figures. Subjects Nos. 5 and 6 are under the left and right arms respectively of human No. 38, but a little further removed from his body, and demonstrate a perfectly dog-like stance, certainly one which no koala could emulate. Subject No. 7 under the right arm of human No. 39 is standing on a dead wallaby. Ultimately, in subject No. 16, the mammal is entirely alone. In Plate XX, Fig. 1, it can be seen on the right margin of the higher part of the rock a little below the solitary woman. This sequence of motifs has shown the mammal in intimate contact with the ornate Hero, in lesser contact with lesser ornate humans, appreciably separated from undecorated but armed humans, killing a wallaby by its own effort, and finally in complete isolation. There are very few recordings in Aboriginal art of the dingo in association with man, and no others showing this sequence of progressive separation in their relationship.

Subjects Nos. 1-7 are practically identical in size and in morphological outline. What any one of these is, they all are. A dog can jump up the side of a man but a koala cannot stand like a dog, so the koala must be excluded.

The wombat can be eliminated by reference to its range of habitat, its natural habits, its form of depiction in rock engravings elsewhere and its morphological appearance in the engravings at Mootwingee when considered in the context of the prevailing art formula there.

*Vombatus hirsutus*, Perry, 1810, the Common Wombat, has small, short, rounded ears and naked nose and is the largest of the wombat species, but its habitat is the south-eastern Australian hilly or mountainous country. *Wombulata*, Iredale and Troughton, 1934, the Hairy-nosed Wombat of mid-southern Queensland, has a hairy muzzle but ears which are longer, narrower and more sharply pointed. *Lasiorhinus latifrons*, Owen, 1845, the Southern Hairy-nosed Wombat, also has a hairy muzzle and longer, narrower, pointed ears. Its habitat is south-west New South Wales, Victoria and southern South Australia. I am indebted to Mr. B. J. Marlow, of the Australian Museum, for the further check observation that neither European historical records nor palaeontology extend the habitat of any species of wombat to the plains of north-western New South Wales, beyond or west of the Darling River.

The wombat has a recalcitrant nature, is nocturnal and shows no inclination to fraternise with man. It is essentially a burrowing animal, can run for a short distance, is a very poor climber and cannot jump. This rules out the three examples of the mammal climbing up or jumping up or clinging to the sides of two men.

Campbell (1899, Pl. XI, 1) illustrated a 10-ft. long outline engraving near French's Forest, Sydney, which he identified as wombat; he acknowledged R. H. Matthew's prior and similar identification in 1895. Morphologically, it is absolutely different from the Mootwingee figures, having a very pointed snout, exceedingly short legs for its total bulk, well-defined small ears and, particularly, a dorsal convexity extending in a uniform sweep from tip of snout to rump. This convex curve is pronounced in the cervico-dorsal junction and clearly intends a different anatomical portrayal from the intention at Mootwingee, where the cervico-dorsal outline is not convex in any figure and is markedly concave in some.

While the Aboriginal artist has poor capacity for presenting anatomical accuracy, he has rich capacity as a caricaturist for seizing on a salient feature for exaggeration. In depicting the wombat, he has elected for caricature essentially the bow-like dorsal outline sweeping continuously from snout tip to rump, although the relative shortness of leg, smallness of ear and rudimentary tail may receive acknowledgment also.

The total subjects at Mootwingee—human, bird, animal and reptile—are depicted statically. In this formula the limbs are excessively shortened relative to body length. In dynamic portrayal, as in some cave paintings in Arnhem Land, the formula to produce an effect of fluid movement is based on the introduction of curvature which gives the sense of action and is particularly effective when combined with exaggerated length of limbs relative to stature.

It is true that all species of wombats have rudimentary tails, and legs which are excessively short relative to total body size. The legs of the animals engraved on Dingo Rock, when analysed within the static art formula of Mootwingee, are far too long to permit classification as wombat. The absence of ears and tail in some of the engraved animals was explained when eliminating identification as sheep, and applies similarly for wombat. It can be noted also that animals Nos. 6, 10 and 12 have five legs and a tail, unless one of the legs is meant to represent a penis.

*Sarcophilus*, a much smaller animal with a longish tail, has a savage disposition in the wild state but is tameable in captivity (Troughton, 1957, 47). Its skeletal remains have been recorded from Lower Murray excavations (Hale and Tindale, 1930 and Mulvaney, 1960) in Layers VI, VIII and IX Devon Downs and Layer 7 Fromm's Landing apparently at approximately the 3000-4500 B.P. mark. Identification as *Sarcophilus* would help to date the engravings, but morphologically it has to be excluded.

*Thylacinus* has smaller ears than the dingo and a tapering, dependent, non-brush tail. Given that the engravings were sufficiently ancient, *Thylacinus* would be more difficult to exclude than the wombat on morphological grounds, excepting that while its stance and its head and forequarters are dog-like, its hindquarters and tail are kangaroo-like. It is more shy and furtive than either dingo or wombat and apparently untameable, at least in adult life (Troughton, 1957, 50-2).

Neither *Sarcophilus* nor *Thylacinus* have been recorded in Australian art, and both probably became extinct on the mainland too early to permit their portrayal in the latest engraving phase of full intaglio. It is difficult also to visualise an harmonious gathering of 11 *Thylacines*, or for that matter wombats either, under the arms of nine men.

All such identifications are esoteric, Sinbadian and unnecessary when the engravings look like a credible and orthodox association of man and dog. In the writer's opinion, all possible candidates outside the dingo are adequately excluded.

It is necessary to mention that subjects Nos. 14 and 8, situated respectively under the left arms of men Nos. 43 and 44, have very ragged outlines, and the possibility that they may portray weapons or other objects dependent from waist belts, and so may not be animals at all, has to be faced. Massola (1960, p. 91, 92) makes reference to the importance of the ritual belt for carrying weapons or ceremonial objects. Mountford (1956, Fig. 44 G) shows a hollow-bodied man and says, "There is no explanation for the projections from the hips". Incidentally, Mountford's 1956 Figs. 16A, 25, 18B show the motif of smaller figures postured under the outstretched arms of larger humans, and his Fig. 41 shows a profile silhouette of a small man or animal clinging to or standing on the left side of a human, as in examples on Dingo Rock. Mountford makes no comment about it. Subjects Nos. 43 and 44 are less decorative than the Hero (No. 34), but are still somewhat ornate, and the similarity of motif favours an identification of animal for the subjects under their arms rather than pendant ritual objects. Hornex rubber impressions were taken from the entirety of the Dingo Rock motifs in 1959 with the intention of making casts for display in the Australian Museum. This has not yet been done, but, when completed, minute study of such casts may permit a revised assessment of subjects Nos. 8 and 14.

Subjects Nos. 13 and 15 are also somewhat doubtful. No. 15 looks like a dog sitting up in a begging posture, but it might possibly be meant to represent some sort of bird. No. 13 suggests an animal sniffing at the right foot of man No. 51. Mountford, 1956, Fig. 32C, shows an animal of similar shape and in identical posture sniffing the right foot of a huge woman. In that same picture another animal near the woman's right hand has almost identical posture and morphological outline as animal No. 4 on Dingo Rock. Mountford simply says "a woman and two unidentified animals".

We are left with 13 subjects which can be classified with considerable certainty as dingoes, two which may be some sort of ritual weapon or decoration and one which may be a bird.

*Affiliation* : Recordings of rock "engravings" of dingoes from other sites are so scanty that it is premature to attempt an analysis of comparative portrayal or affiliation. McCarthy, 1959, Plate 22 and Fig. 4, I, No. 6, shows a dingo drawn in black outline but with a rubbed interior believed to have been made with an abrading stone. This is on the wall of a cave at Conjola, coastal New South Wales. Whether this can legitimately be used in comparison of engraved motifs is debatable. Perhaps it should be reserved for comparison in drawings and paintings. From the Hawkesbury District, coastal New South Wales, McCarthy (1956, Fig. 3, Nos. 9, 10 and Fig. 5, No. 65) recorded three dingoes which are engraved in the outline style. Campbell (1899, Pls. VI and XI) recorded two dingoes in outline at French's Forest and Manly Cove, Sydney. From the full intaglio technique at Depuch Island, McCarthy, 1961, shows Fig. 94, a dingo which was recorded also by Stokes, 1846, and by Petri and Schulz, 1951, and Fig. 321 which McCarthy also identifies as possibly dingo. The three subjects at Hawkesbury are morphologically akin with one another. Campbell's two are similar to one another. Otherwise no morphological similarity of portrayal exists between the various recordings mentioned nor are any akin with the Mootwingee portrayals. In paintings, the morphological treatment of the dingo differs radically from all of these engravings and I am grateful to Father E. A. Worms for drawing my attention to some of the paintings.

*Weapons* : The census table and Text Fig. 2 provide adequate information except to note that subjects Nos. 33 and 51 hold in their left hands objects which may be unhafted hand axes, and one is tempted to think these could be related to the making of the engravings. The left hand was favoured for weapon holding in the case of portrayal of sky god, ancestor, or hero performing some feat (Elkin, 1949, McCarthy, 1959, 1961). The apparent object in the present figures may merely be a crude portrayal of the hand itself and the observation is not stressed. Note also the decorative effect of objects (? ritual) tied to the boomerangs of two men in particular, Nos. 51, 52.

*Unidentified objects* : Nos. 25-29 are amorphous intaglios.

*Emu tracks* : Nos. 56-59 show accessory projections from the median toe, varying from 2-4 in number. No. 58 is particularly striking, and at first glance looks like a small four-legged animal with a large horned head. These examples indicate that the Aboriginal artist drew from observation of tracks left on the ground, not from the shape of the actual emu foot itself.

Forward thrust of the emu's central toe on a wet mud or clay surface produces a splashing impression identical with these engravings. Compare also Nos. 69, 70 and 72. No. 69 shows a separate heel pad impression, Nos. 70 and 72 are much larger, but whereas No. 72 has a very posteriorly prolonged but united heel impression, No. 70 does not show heel impression at all.

The total variety in Nos. 56-103 can be seen in tracks left by emus, and the variation in shape of track depends on the condition of the ground surface when the emu walked on it, plus, of course, the effect of varying momentum at different speeds and torsion effects if the emu was not keeping to a straight line. The unique occurrence of human tracks has been described. In opposite contrast with the other engraved rocks at Mootwingee, wallaby or kangaroo tracks are very few in number on Dingo Rock.

*The tree pattern complex (Text Fig. 2, between Nos. 41, 42 ; see also lower portion of Pl. XX, No. 1) :* No. 42 shows a human figure with two mammillary projections from the sides of the body. A well-defined penis is present, so presumably the figure is male and the lateral projections apparently represent some objects slung in a waist belt. The head is four-pronged, but two of these prongs may represent ears. One of the vertical prongs terminates in a knob, the other links up with a curvi-linear pattern. In his left hand is a spear thrower ; his right arm is coincident with the leg of an emu and beneath this dual-purpose (human arm, emu leg) line are two emu chicks. Continuing from the man's arm (or emu's leg) is a wavy line extending up to the emu's neck which carries an emu track also serving a dual purpose in representing the emu's head and beak.

Our informant, Mr. George Dutton, said the man was the nephew and the wavy line the net with which he caught the emus. On the other side of the nephew is a series of different-sized human foot tracks made by the nephew, his uncle and the uncle's two wives. There is also (No. 122) a large well-carved hand, and (No. 121) a cruder smaller hand ; no explanation is given for these. The uncle was addicted to emu meat and tree grubs, like witchetty grubs. He compelled the nephew to catch emus (note in Pl. XX, Fig. 1 the many emu tracks nearby), but refused to let the nephew eat any of the emu meat. The nephew also had no woman and coveted the uncle's wives. The nephew thought of a plan. He told the uncle he'd found a tree with wonderful grubs in it, but that, if he showed it to him, the uncle would have to chop out the grubs. The uncle climbed the tree and began to chop the bark. The nephew blew on the tree and invoked it to grow, which it did. The uncle said, " Here is the sky ". The nephew said, " Catch hold of it," and then invoked the tree to shrink again, leaving the uncle in the sky.

The curvilinear pattern between Nos. 41 and 42 is the tree connecting nephew, No. 42, on the ground and uncle, No. 41, at the top of the tree. Within the lines of the tree pattern is a goanna (see Pl. XX), but its significance is not known. In the uncle's right hand are a boomerang and an axe (?). The axe (?) is shown as an oval blob within and beyond the concavity of the boomerang. The uncle's left arm appears to be double, embracing an oval area within which is a more or less spherical shape and a crescent of seven dots. There is no information about these, but it is very tempting to think they might indicate the moon and the seven sisters. In actual fact, however, the informant said the seven sisters were not at Mootwingee at all, but were at Sturt Meadows.

Appreciably further up the rock surface, situated about midway between the huge boomerang and the solitary woman, is the weather break, No. 21, already described. Here the two wives took refuge and called for their husband. The nephew said, " There's your husband up in the sky, the man in the moon ; you'll be my wives tonight ". They temporised with him, defecated outside the break and ran away. In pursuit he ran into the faeces and gave up the chase.

*Head-dresses :* The Hero No. 34 has a head represented only in outline, surmounted by a symmetrical semi-circular band within which are three vertical bars. Above this a parallel, double-curved band is fused with a disc on the Hero's right and perhaps originally with another on his left. Fissures in the rock surface have destroyed parts of the engraving. There are two long vertical projections at the summit of the head-dress. The head-dress measures 25 x 25 cms. The Hero with his head-dress, prior to destruction of the lower half of the figure, was probably 55 cms. tall and so the largest subject on the rock. In the Hero's right hand is an irregular patterned disc and in his left hand a decorated, but rather small, curved figure fusing with the disc above it. Perhaps it originally resembled a boomerang. (Our informant said they were ceremonial bundles of leaves.) Standing on his left and right sides are, respectively, the two dingoes, Nos. 2 and 3. This engraving has the most weathered appearance and is probably the oldest figure on the rock.

Fig. No. 43 has a series of eight vertical lines ascending from his head and five from the boomerang in his left hand. Fig. 44 has three vertical lines ascending from a single barred outline head-dress or head. Fig. 52 has one long and two short spikes rising from a bulbous head-dress. The remaining male figures show a progressive simplification in portrayal of the head outline.

*Relative age of the engravings on Dingo Rock :* Subjective observation of the condition of the pecking, together with objective observation of the degree of shattering of the engraved figures, indicates that some engravings on Dingo Rock are older than others.

The oldest stratum quite clearly includes the elaborate Cult Hero, the decorated "Sub-Heroes", the initiates or novitiates armed with boomerangs, and the dingoes; of similar age appearance are the figures illustrating the huge boomerang, the coiled snake and the grotesque emu which is partially intagliated, banded and heavily grooved in outline. The solitary woman approximates more closely to this complex of figures also.

The more southern and south-eastern sections of the rock surface carry engravings of more recent appearance, and most of these are involved in Dutton's story of the man in the moon from the Eaglehawk and Crow Myth.

The best-preserved pecking occurs in the two small emus, which are also the best-designed figures from the viewpoint of anatomical accuracy.

The figures shown in Plate XX, No. 3, look more recent than the earliest stratum on Dingo Rock and the morphological style is also similar. It is possible that they represent somewhat later recapitulation of the earliest complex of motifs on Dingo Rock.

#### MYTHOLOGY OF MOOTWINGEE, ACCORDING TO GEORGE DUTTON

Our informant was Mr. George Dutton, a half-caste Aboriginal. He was interviewed by both writers in 1959 and has now been interviewed by one of us (N. W. G. M.) three times. His age is perhaps 70 to 75 years.

His life story has been described by Beckett (Oceania 95-103, 1958). Repetition here need go no further than to say his mother was a full-blood Wongumara and his father a white stockman who had been in mateship relation with the full-blood Maliangaba husband of the mother. His Aboriginal stepfather became instructor and provider, requested him to submit to initiation and did all he could to transmit the "dark people's" knowledge.

Dutton is sophisticated at the European level, and has considerable contempt for the efficacy of such practices as "boning". (Beckett, p. 99, has more fully referred to Dutton's lack of interest in "the superstitious side of Aboriginal belief" and, instead, his concern with "the big ceremonies".)

Nevertheless, it has been his lifelong inclination, and, it might almost be said, obsession, to acquire the "dark people's" knowledge.

Our first talk with him in 1959 was cut short when he became obviously ill, and one of us (N. W. G. M.) persuaded him to enter hospital in Wilcannia. He then accepted remuneration, but at no time had it been mentioned previously. He appears to have a mission to get his stories recorded. He demanded that Beckett's paper be read to him meticulously, sometimes asking for a re-reading of a few lines. It is a tribute to Beckett that only one line was challenged by Dutton.

As Constable Salisbury observed, there can be no doubt that Dutton believes in and mentally lives this mythology, while at the same time avowing himself a Catholic, having equated in part the Aboriginal mythology with the Christian religion.

Apparently Dutton had not previously been interrogated about mythology relative to the engraving and painting galleries, in brief with a view to archaeological interpretation. In the past other recorders questioned him about kinship, marriage rules and ceremonial procedures including initiation and his mind was geared to talk at these levels.

It was difficult, therefore, to alert him to what amounted to a new theme in questioning. His conversation persistently drifted off to Euriovie and south-west Queensland and stories of mythical snake *muras* wandering across country and naming places.

Dutton, having recovered from his 1959 pneumonia, was subsequently hospitalised in Bourke, and on the occasion of my last interview, July, 1961, he was again complaining of bronchitis. It has therefore not been possible to take him on to the actual engraving sites at Mootwingee.

Beckett says Dutton was born on Yancannia 50 miles north of White Cliffs, but Dutton is now insisting that Mootwingee and Wilcannia were his early home, some of his very early years having been spent near the site of the old hotel at Mootwingee (see map). (Beckett says that from the age of seven, Dutton travelled with his step-father . . . "up into Queensland, over as far as South Australia and down to the Darling at Wilcannia". It was on these trips he learned the names of the hills and waterholes and the myths and legends associated with them, p. 97.)

At our first interview his information was generalised, embracing the total terrain of Mootwingee, Sturt Meadows, Euriowie. At the last interview his information had become appreciably more particularised.

His description of the topography of the Mootwingee galleries, caves, creeks and waterholes and of the Sturt Meadows outcrops is accurate, although he had not been there for several years.

He gives a fair account of the topographical location of a few of the engravings at Mootwingee, but a much more detailed localisation of the Euriowie engravings which Dutton spoke of as paintings. He categorically says that, with the exception of rain-making, no ceremonies occurred at Mootwingee in his lifetime, or in his stepfather's, and, he doubts very much, in his stepfather's father's lifetime, either (which means in the last 100 years, and so prior to white occupancy in 1866). He knew of one rain-making ceremony at Mootwingee when he was a very small boy, but he attended others conducted at Euriowie. He can give a minute and detailed account of this.

He gave his description in what he called Bagundji or River talk, construing and translating as he went along. His interest in rain-making apparently stemmed from the fact that it involved preparations, setting out with a body of men, arriving at the site, making more preparations, conducting the ceremony, waiting under rigid conditions for results and then "all pulling out" to return home. It involved "doing" rather than "believing".

As will be seen relative to the Cult Hero (sic) on Dingo Rock, he is overprone to jump to a diagnosis of Rain-maker. However, as had already been described briefly (Plate XXI, Fig. 1), he is quite firm in insisting that this rock shows not a hunting, but a rain-making, party; he knew the rock was there and says he remembers it.

He correctly described the location of what we have arbitrarily called Track Rock and interpreted it (Pl. XXI, Fig. 5, already described) as a portrayal from the Eaglehawk and Crow Myth of the incident where *wagu* the crow tricked *biljara* the eaglehawk. This story goes on to tell of the eaglehawk's brother-in-law, the spider, taking his dogs to find all the eaglehawk's feathers and patch him up again. He says the spider and his dogs are among the pictures; we could not find a spider among the engravings, but there are several dogs. Dutton says the dog engravings which we located are not the spider's dogs, and they are not the hunter Jaru's dogs either, because Jaru didn't take his dogs with him, thinking he could hunt better alone, and so lost the kangaroo and was then abused by his wife Kukali.

Our "Rock of the Tall Hats" he cannot place topographically and says he doesn't remember seeing it, but from the photographs he identified the head-dress as Kungulada (previously described Pl. XXI, Fig. 2) or, in his own language, Karikumari. The orientation of his memories towards Nockatunga, in south-west Queensland, may be intruding here.

The story of the kangaroo escaping from Jaru, he says, is painted (sic, engraved) at Big Cave (see map), but much better at Euriowie. This was pointed out to him and explained by his step-father from the paintings. In July, 1961, using a stick to draw in the sand, he recalled the figures of the hunter and his dogs and their tracks and the red and the grey kangaroo at Euriowie, but he said the paintings at Big Cave were not much good, the kangaroo wasn't there at all.

He has never seen paintings made nor had his step-father, but they knew what they meant.

He himself asked about the rock which we have arbitrarily called Dingo Rock. He described its position, but referred to it as the rock with the tree—the tree which took the uncle up to the Moon when the nephew was trying to get the uncle's wives.

Beckett, p. 95, says, "Although Dutton sometimes drew a long bow, he proved essentially a realistic and perceptive man". Dutton's proneness to Rain-makers, his possible rationalisation of "Big Cave" paintings as compared with his absolute certainty about the Euriowie engravings, makes one suspicious of the "long bow". But the engravings of the men with dogs on Dingo Rock produced no evidence of this. He flatly said they were "fellows with their dogs and he didn't know any story about them". The solitary woman, No. 40, on Dingo Rock, however, he says is Kukali (the wife of the hunter, Jaru); "she should be on the rocks, there she is". When asked why the men with dogs couldn't represent her husband, he said, "No, that's not them. But that big roo should be on a rock by himself somewhere". (Note what we have called "Roo Rock," see map.) He also says he doesn't know any stories (myths) about dingoes. The elaborately decorated figure No. 34, however, produced a response. In 1959 it was a Rain-maker; in 1961 it was Kulabiru. Challenged about this, he said, "Well, he's a big shot because he's got all that head-dress and 'leaves' in his hands". In brief, he doesn't know. But subsequently, of his own accord, he said, "That fellow might be Kulabiru, his picture's up there somewhere; he went up that creek, he didn't go up near the cave".

Then followed the story of the journey of the *mura* Kulabiru from away down south, up over the ridge a little east of the site of the Old Cobb Hotel, across the flats and up Giles Creek and on to White Cliffs (see map, Text Fig. 1). Other journeys of Kulabiru included camping with the Seven Sisters at Sturt Meadows before they went up to the skies.

Later again he said, "That Kulabiru went through Gnalta; he sat down there to have a spell; he saw a neat round hill and said that's my head cap and called it that. After he left White Cliffs he came straight across to the River and saw a dog pad and said I'll stop here. That picture on the rock, he's got a big round hat and those fellows had dogs. He might be Kulabiru because he's there somewhere."

All this is tenuous, and obviously he was trying to piece together sections of knowledge to arrive at a conclusion sufficiently convincing for his own acceptance rather than mine.

Setting aside these deductions, the real fact in Dutton's knowledge is that the *mura* Kulabiru made the waterholes in Giles' Creek and that his picture is somewhere on the Gallery. That much had been transmitted to Dutton by his stepfather.

Asked why the sites had fallen into disuse, he said simply that the people had gone, they were not so many, they became fewer, there weren't enough for gatherings and they moved away. In other words, Mootwingee was entering the realms of Aboriginal prehistory even before European intrusion.

It is easy, therefore, to appreciate that the engravings soon lost their individual meanings and interpretations, while the main narrative of the mythology of the region was handed on within the body of traditional knowledge. It is possible that we will never know whether the engravings were made to portray, for example, the journeys of the *mura* Kulabiru and the episodes from the Eaglehawk and Crow myth, or whether this traditional mythology was at a later period rationalised as being the interpretation of the engravings.

Dutton has absolutely no knowledge of how the engravings were made, nor had his stepfather nor his father in turn. He thinks it could have been *before* the dark people, and said no one could make them in this hard rock and if the dark people did make them, perhaps it was in mud before it got hard like rock.

His information strongly supports the opinion, derived from hypothetical calculations in the description of Dingo Rock, that engravings ceased at Mootwingee long before the white man's arrival.

It can be accepted that any long bows drawn by Dutton are no more than rationalisations or elaborations on the base of some factual knowledge. If he doesn't know he says so. An attempt was made to probe him about other sites near Cobar. He most forcefully expressed himself as knowing nothing about anything east of Wilcannia. His stories lie west or north.

### Summary of Dingo Rock and of Dutton's Information

Morphological and other analyses classify a minimum of 11 and a maximum of 16 animals as dingoes.

Dutton's information strongly supports the hypothetical opinion, calculated in the description of Dingo Rock and its motifs, that engraving ceased at Mootwingee prior to European arrival.

Knowledge of how the engravings were made was lost certainly prior to 100 years ago and probably much longer, but meaning for some of the intagliated groups has been transmitted up to the present time. Briefly the engravings are portrayals of myths. The myths are remembered in detail, but capacity to locate and to recognise and construe the engraved figures portraying them falls into four categories:—

1. Several groups representing incidents from the Eaglehawk and Crow Myth are familiar to the degree of detailed interpretation. Portrayal of other incidents is known to exist, but there is uncertainty about their location. On Dingo Rock, the Man in the Moon story from the Eaglehawk and Crow Myth is very completely identified and the engravings thereof occupy the south-eastern third of its surface.

2. Lesser incidents, like the legend of the hunter Jaru, are located and identified in some sites (Eurriowie), but only vaguely referred to in others (Mootwingee). Thus, on Dingo Rock, Kukali the wife of Jaru, and perhaps a few kangaroo tracks are less forcefully identified than the components of category 1.

3. Representation of the *mura* Kulabiru and perhaps of his activities is known to exist, but his topographical location among the engravings has been forgotten. The largest and most elaborate humanoid figure on Dingo Rock was tentatively suggested as being Kulabiru by the informant, but progressively rationalisation made the identification stronger. Critically analysed, two facts support the rationalisation. Firstly, the *mura* was known to be depicted "somewhere" in Main Gallery. Secondly, the Cult Hero engraved on Dingo Rock is absolutely unique for the Mootwingee Galleries.

4. Other naturalistic figures are identified at their overt value, but any knowledge of why they are there or what myth they portray is denied. On Dingo Rock, the sequence of motifs of men with dogs is identified as such and no more.

The question arises as to whether the engravings were originally made to portray the myths or whether they were later rationalised as expressing the myths. The former possibility is supported by what would appear to be a stratification in the categories of identification; particularly as the categories of vaguest identification contain the engravings which appear to be the oldest on Dingo Rock, and, incidentally, the most ornate, although crude in morphological portrayal.

Apparently represented in the oldest stratum of engravings on Dingo Rock is the *mura* ancestor or "spirit being" concept, with its ancillary myths of creating and naming natural features, of the travels of Heroes with their dogs and of the transmission of their accomplishments to initiates and novitiates.

The humanoid figures elaborately accoutred and ceremonially posed suggest the site was one for re-enactment of the myths, combined probably with initiation ceremonies. The fact that the deeply grooved, banded and partially pecked emu, the huge boomerang, the coiled snake and the solitary woman appear to belong also to this older series of figures suggests that totemism and increase rites may also have been involved.

The Cult Hero here identified was perhaps not seen, certainly not described nor illustrated, by earlier writers. Hence Elkin (1949, 153) was led to state: "There is, however, no indication of cult heroes" (at Mootwingee). Had Elkin been in possession of present data, he would, doubtless, have stressed more vigorously his remarks (op. cit., 141, 148, 155) about *mura* mythology and its influence in this region.

The possibility that this complex of figures may additionally represent tenuous derivations from the concepts of the rainbow serpent and of the left-handed sky-hero cannot be entirely excluded.

The other complex of figures on Dingo Rock, equated by Dutton with the Eaglehawk-Crow myth, suggests that this theme had more recent fixation in Aboriginal activities and memory than the *mura* traditions.

### ENGRAVING STYLES AT MOOTWINGEE

The styles present in the site as a whole are limited in number.

The linear series (Text Fig. 5) is of the simplest kind and lacks the complexity seen at sites in north-western Australia in particular. The little stickmen lack the grace and variety of those depicted in northern Australia. The barred style is seen in one sacred board or shield (Text Fig. 7), in 12 human figures and in six head-dresses (Rock of Tall Hats, Pl. XXI, No. 2). The broad pecked band style is represented in circles and ovals, and in some of the designs (Text Fig. 6). Partial or regional intaglio is seen in a few figures with heavily pecked outline and bars—kangaroo (Pl. XXII, No. 3), emu (Text Fig. 2, Nos. 17, 22).

The full intaglio is the dominant style, and is well exemplified in the various humans animals and their tracks.

#### Pecking Methods

Previous authors have stated that the pecking at Mootwingee was done with a harder stone, such as stone axe (Pulleine, 1926, 180), flint or some such material (Riddell, 1928, 15), or with a sharp-pointed stone implement, driven by a wooden or stone hammer (Black, 1943, 13, and Mitchell in same reference, 68). No doubt the term flint was used loosely, since flint does not occur in the Mootwingee area. Basedow (1914, 198) said the implement used at South Australian sites was perhaps a stone chisel of similar type to that employed by the central Australian Aborigines in modern times. Elkin (1949, 139) was told by a Wilyakali man that the carvings at Euriovie were made with a narrow hand-chisel by the Seven Sisters who went up into the sky to live. Care should be exercised here in interpreting what is meant by a narrow hand-chisel. Several generations of natives have passed on since white settlement began in the 1860's at Mootwingee and earlier on the southern side of the Darling River, so that metal tools, among the first items given or traded to natives in Australia in the early days, were known to them in the far west about a century ago.

A narrow hand-chisel could mean a metal chisel in the mind of a modern native several generations removed from the use of stone tools. On the other hand, narrow ground-edge stone chisels found in the west are up to 6 in. long (McCarthy, Bramell and Noone, 1946, Figs. 294-5). The smaller ones were hafted in gum and would, like the axes, probably break out of the haft after a few blows on rock, but the longer ones could be used as hand tools. None of these chisels are recorded from Mootwingee, Sturt's Meadows or Euruiowie, and we did not find any in our intensive collecting. As they are rare implements, they might well be rejected for pecking purposes. One would expect a stone tool used for engraving to be a common strong type when the immense number of pecked figures is considered.

The pittings are of two main kinds. The majority are gashes or cuts, oval to tear-drop in shape, which vary in size from  $\frac{1}{8}$  to  $\frac{3}{8}$  in. long, and up to  $\frac{3}{16}$  in. wide. Their size is related to that of the figure, being smaller on the average in small figures and bigger in such figures as the three large kangaroos, emu and bandicoot. The other kind is a circular pit, seen commonly in the emus' eggs, and appears to be used most frequently on the smaller figures, and for comparatively delicate work. It is obvious that implements of different types and sizes were used for the gashes and pits, unless there was one that would make both kinds of markings.

The gashes and pits could not have been done with a ground-edge axe unless the corner of the blade was sharp or pointed, and maintained in such a shape. In general the axes from western New South Wales have rounded corners and blades. The hafted adze or chisel of the *tula* type, which Basedow suggested as being the pecking implement, occurs at Mootwingee where we collected the prepared adze and its two kinds of worn-out slugs (McCarthy, Bramell and Noone, 1946, Figs. 105-08). This implement occurs in the largest numbers, and its working edge is suitable for gashing but not for pitting. It is doubtful, also, whether the gum haft would stand up to more than a few blows on rock before the adze flake would fall out, a constant irritation to an artist. The pitting requires a very hard, sharp, cornered or pointed implement, and the gashing a sharp edged tool, both more efficient when used in the hand, and what it was or they were we do not know. We found no implement in all our collecting that would be entirely suitable and common enough for the task of either Sturt's Meadows or Mootwingee. The natives apparently did not leave the implements on the site, otherwise worn and broken ones should be found there in comparatively large numbers. The puzzling point about this problem is that a well-prepared stone tool appears to be required for pecking work, and yet the archaeologist is as yet completely baffled in his attempt to identify or find such an implement at or beside any of the rock engraving sites in Australia. In its absence perhaps an irregular pointed lump of stone served the purpose, and was thrown away when of no further use. The rounded and flattened faces of hammerstones are completely unsuitable for fine pecking.

The process of pecking begins in one of two ways. In a simple figure like a little man, boomerang, tracks and the like, scattered gashes or cuts were made all over the surface (Pl. XXV) to be pecked. Several layers of the pecking were necessary to produce the thickly-pitted or battered appearance of a deep intaglio, and these layers were either done on separate occasions or one after the other in the one working session. In figures like the emu (Pl. XX) on Dingo Rock, and the other large figures, the outline was usually, but not always, defined with a groove, and the body pecked in afterwards. The large kangaroo (Pl. XXIII, No. 3) illustrates this method well, and suggests that the more intensive pitting was done in zones on big figures. The intaglio surface of the figures, generally from  $\frac{1}{16}$  to  $\frac{1}{8}$  in. deep, although some are  $\frac{3}{16}$  and  $\frac{1}{4}$  in., in depth, have apparently been pecked over intermittently in preparation for ceremonies year after year, or generation after generation, and in the whole gallery only a few boomerangs, emu and kangaroo tracks are as much as  $\frac{1}{4}$  in. deep. Occasionally an existing figure in outline has been altered to a full intaglio, a process which seems to have been taking place with the big kangaroo (Pl. XXIII, No. 3), with an outline body and heavily pecked tail.

The general impression one gets at this site is that the pits were made with free hand blows with a sharp pointed or cornered implement. The outline of the figures is uneven and the gashes are out of alignment, suggesting a freehand percussion rather than the firmer outline that could be made with the better controlled hammer-gad method.

The engravings in the rock shelters are very crude on the whole, being made in a softer and coarser rock unhardened by exposure to the sun.

Here and there, on the vertical walls of the valleys, are to be seen figures of little barred men battered or bruised out in a thin ferruginous layer. This simple process produces a fresh buff-coloured silhouette or intaglio which stands out against the dark brown to black colour on the wall. This bruising technique will be discussed in the section on Affinities. In these wall figures, however, areas of distinct pittings, identical with those in the main gallery figures, are to be seen, and they probably belong to the full intaglio period.

### Patination and Antiquity

Pulleine (1926, 180) stated that some of the petroglyphs at Mootwingee are apparently of great antiquity, being almost invisible, and rocks near the water were covered with old and new carvings. He considered that none of them are very recent and that, as a whole, they were made when the rock slope was in better condition than now. Barrett (1929, 416) wrote that "our experts pronounced them to be age-old, 5000 to 10,000 years perhaps. Others are evidently more recent, done not more than a century ago . . . it seems certain that Mootwingee was a camping ground of some tribe that roamed the western country before the coming of the blacks that explorers found in occupation . . . the bird footprints by the pool are the oldest of the carvings". Mitchell (in Black, 1943, 69) said that the now fast crumbling and cracking would indicate no great antiquity as the breakdown of exposed rocks in arid areas is comparatively rapid. He pointed out that one has to be careful in ascribing any great antiquity to these petroglyphs in the absence of geological evidence. Riddell (1928, 15) said that the newer were mixed with the old, and many appear to be of great antiquity. Dow (1938, 109) said these pictures gave one the impression of great antiquity, for what were once continuous designs have now been broken up by the cracking and exfoliation of the surface.

Observations in the future on the deterioration of these rocks will form a guide to the antiquity of the engravings on them. Factual data at present is scanty, and it is understandable that the subjective opinions of these writers should be conflicting.

A more detailed attempt at analysis appears to indicate that the majority of the engravings in the Main Gallery were pecked into fresh rock surfaces exposed by the shedding-away of a previously higher layer of rock.

These comparatively hard fresh surfaces are resistant to erosion for a long time, duration as yet unknown, as demonstrated by the larger proportion of the engraved figures in Main Gallery. Even if it be assumed that the full intaglios were engraved up to the time of white occupation, and the custom may have ceased long prior to that, it is obvious that the surfaces of the rock are practically unaffected by weather erosion. Instead, the effect of the natural elements and time is to produce cracking which progresses and leaves portions of a carving displayed on both sides of a fissure. Accentuation of the process has resulted in great slabs of engraved rocks, bearing portions of figures around their edges, becoming separated from the main layered mass and from each other on the steep slope of the gallery.\* Other blocks from a higher layer have fallen into the wide crevices between the slabs, and as there are occasional carvings on their now uppermost side, it is clear that some occupied their present position before the Aborigines abandoned the site. Those in the crevices beside Dingo Rock apparently occupied such position after its engravings were completed.

The majority of the engraved figures are not patinated nor weather-eroded to any degree. The photographs (Pls. XX-XXVII) show that the pecking is extraordinarily well preserved and, further, that the process of cracking and breaking up of the rock is more rapid than the weathering of the actual figures. It is quite clear that the carvings were not made on cracked surfaces. The central problem of their antiquity therefore rests in the rate of cracking of the rock rather than in the rate of weathering of the engravings, and this rate is unknown.

Relative to this rate, a little evidence is available from assessment of minor discrepancies in the condition of the Main Gallery as shown in photographs taken between 1920 and 1930 and those taken between 1955 and 1959. Thus in Riddell's plate (1928, Pl. i) a large emu track is shown on the edge of a fissure, but the section of stone bearing it has now either broken away or it may have been taken by a visitor. Vandalism may nullify such approach, but certainly based on available photographs the cracks across many figures appear to have got no wider in 30 years. Hence, the rate of expansion of these cracks appears to be very slow, and this is supported also by the fact that some engraved rocks show no signs of cracking at all in a minimum time of a century since the white man occupied the country. The slabs, of course, may be slipping imperceptibly all the time, and only intermittently move appreciably apart.

It must also be noted that in some engravings the sandstone has weathered away to leave exposed the edges and faces of the conglomerate it covers, and this is almost the final stage in the destruction of the actual engraving by weathering agencies. This form of weathering has attacked a number of full intaglio tracks and a little man. (Pl. XXII, No. 7.)

\* In the main gallery a large area of rock in the middle of the slope has broken up and either disintegrated or gone down the slope into the creek bed. This has removed the support of the carved face higher up the slope, with the result that it has cracked into a dozen or so separate slabs, now up to 3 or more feet apart, which are also slipping down the slope. A concrete wall should be built across the middle of this slope to arrest this process and hold the carved slabs in position, otherwise the gallery will disintegrate completely in time.

Another process that takes place is that engravings on rocks in the creek bed, or where water flows or seeps over them for some time after rain, become smoothed and faint and covered with a clear glossy patina (Pl. XXI, No. 3). The deposition of silica in this way hardens the rock surface, but the water at the same time wears it and the engravings down very gradually. Good examples are a lizard beside the large pool at the base of the slope below Big Cave, human hands and other figures on a boulder just below this pool in the bed of the creek, and some of the figures on the Rock of the Little Women. The heavily engraved surface (Pl. XXI, No. 5) has also been affected in this manner as it is at the base of the main gallery in a position where water from excessive rains would cause the creek to rise high enough to wash along its face. This water patination would be a fairly rapid process in terms of years even though the rainfall in this region is erratic and in the vicinity of only 10 inches per annum.

The main gallery is, in our opinion, the most recent one at Mootwingee. There appears to be an older one, where unpatinated and recent figures are mingled with old and almost weathered-out engravings on a second slope behind the main gallery. A similar range of recent and old figures exists in two smaller places about one quarter of a mile to the south-east of the main gallery. Another very old gallery existed on the steep slope of rock extending from the creek to Big Cave (map), where some very weathered figures still exist on knobs of rock which have resisted weathering agencies.

To sum up, in our opinion, the sequence at Mootwingee is that (1) the engravings were first made on smooth, hard, either recently or freshly exposed rock surfaces which (2) have since been sub-divided by cracks, and (3) fissures caused by the slabs slipping down the slope. Thus, the rocks bearing the nesting emu, banded circles and other figures would be the last engraved at the site as a whole because of the uncracked condition of the surface upon which the engravings are done. Hence it is clear that the age of the engravings varies from the unpatinated ones on uncracked rock surfaces to those which have almost weathered out on hard, resistant rocks, and those on badly cracked blocks which have been displaced in the course of time.

Previous investigators of pecked sites in South Australia, including Basedow (1914), Hale and Tindale (1925), and Mountford (1929, 1935) all reported that local natives, some of them still living tribalised life, who were questioned in the vicinity of various groups of engravings, said they knew nothing about them and usually regarded them as belonging to the Dreamtime. Harney (1952) obtained interpretations of some small groups on Mt. Wedge Station, central Australia, and Elkin (1949) of sites in south-eastern Australia. Hale and Tindale (1925) thought the carvings of circular series of straight indentations, such as might be made with the end of a cold chisel, were probably recent sporadic attempts of living natives to copy the ancestral work without knowledge of its original significance. Mountford (1955) thought a modern hammering technique that he recorded in the Northern Territory to be of similar nature.

Summarised, it can be said that Aborigines living in the vicinity of pecked engravings in various parts of the interior of Australia have denied all knowledge of their making and attributed their creation to the Dreamtime people.

Local natives have never been taken to Mootwingee and questioned on the site about the rock art there.

George Dutton informed us that at no time during his lifetime nor, as far as he knew, during his stepfather's lifetime, was any carving or painting done at Mootwingee, and he has no knowledge at all of how the engravings were made, but some of the mythology relating to the site is still preserved.

The two stories that he gave us agree basically with the Eaglehawk and Crow myth recorded by Tindale (1939) for the Maraura tribe on the lower Darling River, and whose widespread distribution in Australia he mapped. Dutton's story of the moon is act III, and of the crow act II, of the Maraura myth. The important episodes described in both versions include (1) failure of one man to possess two wives of the wrong marriage class, (2) leaving food secretly for them, (3) attempting to kill their guardian by burying him in a grave from which he escapes, (4) killing of the guardian's son, (5) evading of the man by the women leaving large faeces in his way.

But George Dutton was completely baffled by all the designs, and motifs illustrated in photographs shown to him.

The Main Gallery itself has had a long history, extending from an intermediate to a late intaglio phase of engraving, and quite obviously some adjacent engraving sites and particularly the gallery near Big Cave are still older.

## CAVE PAINTINGS

The map indicates three areas at Mootwingee where rock shelters were examined. The first and second areas are approximately 3 to 3½ miles north of Mootwingee Homestead.

The first, shelters 1-4, is in a north-easterly location near the source of Big Cave Creek. Shelters 1-3 extend 250 ft. along the northern side of a high ridge and have uneven rocky floors with no occupational deposit. Two trimmed flakes were picked up in the vicinity, but it cannot now be ascertained what other implements may have been collected here since the discovery of the paintings. Shelter 4 is on the eastern face of an outcrop separated from shelters 1-3 by a broad rocky slope descending steeply from the plateau above to some rock waterholes a furlong to the south-west, representing the beginning of Big Cave Creek. This slope is the site of a gallery of very old and now indecipherable engravings.

The second area, shelters 5-14, three-quarters of a mile south-west of the first series and three-quarters of a mile due south of the Main Engraving Gallery, is located along a ridge forming the south-western and southern boundary of Nootambulla Creek Flats. A broad apron or ledge fronts these shelters, which face due north, and although they are ideal for habitation, occupational deposits were found only in two, Nos. 9 and 14; these were excavated.

The third area, shelters 15-21, is distributed over a high rocky ridge 2½ miles south-south-east of the homestead. A creek running approximately from north to south divides the ridge into a western and an eastern portion. The eastern side of the western portion presents a high steep rock face in which the majority of the shelters occur, all of them offering a wide view of the creek valley, facing some 5° to 10° north of due east. One shelter, No. 20, occurs on the eastern portion of the ridge and faces a little west of north. There are also two shelters high on the almost vertical western face of this eastern portion in which paintings occur; these were seen through a telescope and were not examined further. There are probably others in equally inaccessible parts of the outcrop. Only two shelters have occupational deposits, Nos. 15 and 16, which were excavated. Scattered implements, including mill-stones, were found on the valley floor.

A total of 21 shelters containing paintings were located and are here described; six of these also contain engravings.

*First Area—Cave 1*: The most eastward of this group is a high shelter, 50 ft. long. A frieze extends for 25 ft. across the back wall at a height of about 5 ft. and presents 30 mostly red, but a few yellow, human hand stencils and red stencils of a boomerang and a coolamon. At the base of the wall a frieze of engravings extends for 16 ft. Most are fresh and unpatinated, but some are old, faded and dirty like the grey rock face. They portray in punctured outlines, half an inch wide and 3/16 deep, tracks mostly of kangaroo, but a few of emu.

The series has been added to, suggesting that successive generations have added tracks as part of a ritual.

*Cave 2, or Big Cave (Text Fig. 9)*: This immense shelter is the largest at Mootwingee. The vast sloping back wall presents a ritual setting for the most extensive frieze of paintings stretching for 70 ft. longitudinally, with figures scattered from near floor-level to a height of 9 ft.

There are approximately 137 mostly red and dark red, but some yellow, human hand stencils. They vary from excellent to old, faded, barely decipherable condition. Stencilled also in red are two human feet, a conical object, a club with thick rounded head, two coolamons, a boomerang and a line of four foot-like objects; in white are a conical object, a pair of conical objects on a bent shaft, six boomerangs, a lizard and a crescentic object; in yellow are a coolamon, a mammal skin and a stick. Some of these stencils are unique.

A feature of the paintings is the portrayal, in sets of tracks, of several kangaroo hunts. One of these hunts displays 22 tracks of the hunter, interspersed among 100 hind and six fore feet kangaroo tracks in crudely applied, thick white paint; it begins in the middle of the frieze, leads to a dense concentration of tracks suggesting the animal stopped either to drink or feed, continues eastward along the wall beyond a point where the hunter's tracks cease. This suggests the kangaroo escaped, and is probably the representation of the story of the kangaroo escaping from the stupid hunter explained to us by our informant, Mr. George Dutton, who said this story was portrayed also at Euriowie, but in the latter site portrayal was of the actual hunter and kangaroo instead of merely by tracks.

Separate and similar hunting stories are probably indicated by 20 pairs of kangaroo tracks in red together with a circle of hunter's tracks near a lizard at the eastern end of the frieze, and again by a vertical line of four pairs of wallaby tracks in yellow in the middle of the frieze. Near the western end of the frieze also is a series of 12 pairs of small red tracks, probably wallaby, with six short angled lines beside them.

Other items scattered through the frieze are—In dark red silhouette : two vertical curved lines, apparently part of an old figure, four snakes, lizard. In red silhouette : boomerang. In white silhouette : a set of four boomerangs, three lizards, emu's shank and foot, a set of three vertical rods, shell-backed lizard, apron, plant-like figure. In white outline : lizard. In yellow silhouette : pole club, line of five blobs, snake, short vertical bars.

These paintings vary in age and state of preservation, some of the dark red ones in particular being old and faded. Many of the stencils have been chalked in for photographic contrast by tourists, some from Broken Hill, whose names and addresses have been scratched among the paintings as well as being chiselled into the rock galleries.

*Cave 3* : This is a westward continuation round a knobby outcrop of Cave 2. It contains 33 red stencilled hands in varying states of preservation and a faded, dark-red snake winding for 30 ft. up and down along the rock face. Some tourist has outlined this snake in white, presumably for photographic purposes. The snake is not stencilled as stated by Pulleine (p. 187).

*Superimpositions in Caves 1-3* : Faded dark-red indeterminate figure under stencils ; red stencils under purplish-red stencils ; yellow stencil under red and white stencils ; pasty white tracks of kangaroo hunt under stencils ; red stencils under white apron ; red and purple red stencils under red snake ; yellow stencilled boomerang under red stencilled hands ; set of three vertical solid white rods under a solid white track under a yellow stencilled stick ; solid white tracks under red stencil paint splashes.

*Cave 4* : Long axis lying north-south, 40 ft. long, facing due east, contains a double boomerang-like design in red stencil, 11½ in. long, and a set of intaglios engraved very crudely in the soft coarse rock of the shelter, but identical in subject with those of the outside galleries. They include two men, a man standing on one leg, emu and kangaroo tracks, a vertical line of four emu tracks leading to a clutch of eggs, boomerangs and other indeterminate figures.

*Second Area—Cave 5* : Fifteen feet long, six deep and eight high ; contains 10 red and one white stencils of hands.

*Cave 6* : Twenty feet long, eight deep, 10 high ; contains 12 red stencilled hands, yellow stencilled coolamon 17 x 7 inches, and thick, yellow, rough-edged smudges over six of the red hands.

*Cave 7* : Forty feet long, 15 deep and high ; contains stencils of 12 red hands, three purplish-red hands, one of which is a child's, purplish-red club 20 in. long, superimposed over a red hand, and a yellow foot.

*Cave 8* : Forty feet long, 15 deep and high ; the rough back wall is only partly decorated and presents a white stencilled hand, three ovals in thick white outline (one resembling a shield or coolamon 41 x 13 in.), old white emu tracks and indeterminate figures and a red emu track. There are also two pecked emu tracks. Two equally large and suitable shelters adjoining this one contain no paintings or engravings.

*Cave 9* : Thirty feet long, contains a pair of red emu tracks, three faded red stencilled hands and a floor deposit which was excavated.

*Cave 10* : Fifty feet long, 12 deep, 15 high ; contains stencils of 20 red hands, seven white hands, a white boomerang 18 in. long, two yellow hands and a boomerang 26½ in. long. Superimposition is yellow and white over red.

*Cave 11* : Sixty feet long, 20 deep, 25 high ; contains red stencils of 80 hands and two boomerangs 24 and 25 in. long ; purplish-red of 21 hands and boomerang 24 in. long ; white of one hand and boomerang 18 in. long ; yellow of four hands. The red stencilled hands include a closed fist, and a hand complete with forearm. There is also in thick white outline, a small oval at the end of a line, superimposed over the purplish-red stencils. Other superimpositions are yellow over faded red stencils, white stencil over red splashed surface. The bottom ledge of the wall bears indistinct, weathered engravings.

*Cave 12* : Fifteen feet long, six deep, 15 high ; contains very faded red stencils of 10 hands and a boomerang 24 in. long.

*Cave 13* : Sixty feet long, 12 deep, 20 high ; contains stencils in purplish-red of eight hands and a boomerang 9 in. long ; in 24 hands, two conical objects 11 and 14 in. long, one of which is like a cylcon, a club head 4 x 2 in., a trapezoid 5½ x 2 in. ; in yellow a hand on reddened rock and a boomerang 13 in. long. Thick white paste is daubed in three vertical bands. Superimpositions include white boomerang over red hand stencils, purplish-red over red hand stencils. The bottom ledge of the wall bears a lightly pecked circle 7 in. in diameter, a smaller circle and several dozen pairs of kangaroo tracks very weathered and almost indeterminate.

*Cave 14* : Thirty feet long, 12 deep, 18 high ; contains red stencils old and very faded of 50 hands, white stencils of 12 hands of which one is complete with forearm, a straight club and a boomerang each 18 in. long. On the lower ledge of the wall are older and more recent engravings of kangaroo and emu tracks ; the more recent show also radiate-circular designs and a little man. Tourists' names are scratched among the engravings. There is a floor deposit which was excavated.

*Third Area—Cave 15* : One hundred and six feet long, 30 deep and high, this shelter is 250 ft. above the valley floor and its back wall slopes forward in a series of alcoves and rough faces. A smooth narrow face a few feet above the floor bears stencils from end to end for 30 ft. In one series in the middle of the cave are stencilled 50 hands in red, 41 in purplish-red grading almost to black in fresh examples, 20 to 30 in faded red, two in yellow and one in yellow superimposed on a reddened surface. There are also stencils in red of three boomerangs, two snakes and a club, and in yellow of three boomerangs. Seven hand impressions in wet mud or brown ochre constitute a unique set at Mootwingee.

At the north-western end are six oval shields or coolamons measuring 20 x 6 to 25 x 7 in., all painted in solid purplish-red, five vertically, one horizontally ; 11 vertical white lines are 1 to 3 in. apart and a set of yellow lines form a vertical indefinite pattern ; there is also a dark rusty-red faded lizard.

The dark red ranges from purplish to blackish and the same colours are used both for stencils and other paintings. The floor deposit was excavated.

*Cave 16* : Twenty-five feet long, 10 deep and high, on a slightly lower ledge than Cave 15 this concave walled alcove has a painting frieze from waist to standing height above a line of pecked engravings on a sloping ledge one foot above the floor.

There are stencils in dark red of 20 hands, in bright red of 50 hands, a pair and two more boomerangs, two coolamons and a baby's foot ; in white are 18 hands, a club 10 in. long with bulbous head, three coolamons and apparently a model of a mammal cut out of bark ; in yellow are 17 hands of which 12 are over a reddened surface. The coolamons measure 13 x 8, 12 x 4, 23 x 9 in. Silhouettes in a thick, crudely applied, pink-white paste in the middle of the cave include a shallow curved boomerang, three vertical bars 4 to 6 in. long and a horizontal bar.

An old series of dark red emu tracks occur among the stencils and above the frieze on a separate ledge.

Superimpositions include white coolamons over red boomerang stencils, white over dark red and bright red hands, yellow over white hands, pink-white silhouettes over red emu tracks and human foot and hand stencils. As the white stencils are freshest in appearance, the underlying red stencils give a false impression that the white hand stencils are infilled with red.

The engravings extend for 15 ft. and the intaglio grooves range up to 1 in. wide and  $\frac{1}{8}$  in. to  $\frac{3}{16}$  in. deep ; they include emu and kangaroo tracks, boomerangs, an elaborate curvi-linear design, double crescent, bladed club, a mammal-like figure and two little men. One of these has an indeterminate triangular object, perhaps a boomerang, in his left hand and a mammal-like figure under his right arm. The other man has lateral projections from his head, a boomerang in his right hand and an indeterminate subject a little like a mammal under his left arm. These two men are very similar in composition to the men with dogs described on Dingo Rock in the main gallery of engravings.

The floor deposit was excavated.

*Cave 17* : Consisting of two alcoves, the first is 8 ft. long, 5 ft. deep and high, containing seven red and three yellow hand stencils in faded to medium condition. The second, 12 ft. long, 6 deep and high, contains in the northern corner nine red stencilled hands varying from faded to well preserved ; in the southern part are five very faded white and five faded yellow hand stencils.

Superimposition : Large dark red kangaroo tracks underlie all other figures ; six yellow lines overlie indeterminate red figures, little red men are over thick and crude white goanna, yellow emu track over faded red stencilled hand, thick pink-buff figures over dark red tracks and light orange tracks. The wide range of colours is notable.

*Cave 18* : Also consisting of two alcoves, the first is 30 ft. long, 10 deep and high, has a frieze 10 ft. long and 4 ft. high in which are stencilled 13 red, seven white, three yellow hands, a yellow and a faded red snake, and there is a bright red circular object, 4 in. in diameter. There are rows of three, four and five single emu tracks, a pair of kangaroo tracks and a semi-circular line, 8 in. long all in dark red ; eight parallel sloping lines, 10 to 13 x  $\frac{3}{4}$  to 1 in., in red ; three bars, 6 x  $\frac{3}{4}$  in., and an angled outline design 20 in. across in white ; an angled line, a set of three boomerangs, emu track and oval in yellow.

## ANALYSIS OF SUBJECTS, STYLES AND COLOURS

Subjects	Colours	Stencils	Sub-totals	Impressions	Silhouettes and linear	Sub-totals	Outlines
Human hands .. .. .	Red ..	807	..	..	..	..	..
	White ..	52	..	..	..	..	..
	Yellow ..	76	935	..	..	..	..
	Brown ..	..	..	7	..	..	..
Human feet .. .. .	Red ..	3	..	..	..	..	..
	White ..	1	..	..	29	29	..
	Yellow ..	1	5	..	..	..	..
Bandicoot .. .. .	Red ..	..	..	..	1	..	..
	White ..	1	1	..	1	2	..
Mammal skin .. .. .	Yellow ..	1	1	..	..	..	..
Snake .. .. .	Red ..	3	..	..	4	..	..
	Yellow ..	1	4	..	1	5	..
Lizards .. .. .	Red ..	2	..	..	2	..	..
	White ..	3	5	..	3	5	1
Boomerangs .. .. .	Red ..	15	..	..	..	..	..
	White ..	9	..	..	2	..	..
	Yellow ..	2	26	..	3	5	..
Clubs .. .. .	Red ..	6	..	..	..	..	..
	White ..	3	..	..	..	..	..
	Yellow ..	2	11	..	1	1	..
Coolamons .. .. .	Red ..	5	..	..	..	..	..
	White ..	3	..	..	..	..	..
	Yellow ..	5	13	..	..	..	..
Ovals .. .. .	Red ..	2	2	..	1	..	..
	White ..	..	..	..	..	..	3
	Yellow ..	..	..	..	1	2	..
Shields .. .. .	Red ..	..	..	..	6	6	..
Men .. .. . Tracks .. .. .	Red ..	..	..	..	2	2	..
	Red ..	4	4	..	..	..	..
Kangaroo Tracks— Hindfoot .. .. .  Forefoot .. .. .	Red ..	..	..	..	35	..	..
	White ..	..	..	..	100	..	..
	Yellow ..	..	..	..	8	143	..
	Red ..	..	..	..	9	..	..
	White ..	..	..	..	6	15	..

Emu Tracks .. .. .	Red ..	1	1	..	25	..	..
	White ..	..	..	..	3	..	..
	Yellow ..	..	..	..	1	..	..
	Orange ..	..	..	..	3	32	..
Plant .. .. .	Red ..	..	..	..	1	..	..
	White ..	..	..	..	1	2	..
Emu leg and foot .. .. .	White ..	..	..	..	1	1	..
Double boomerang design .. .. .	Red ..	..	..	..	1	1	..
Apron .. .. .	White ..	..	..	..	1	1	..
Conical .. .. .	Red ..	2	2	..	2	2	..
Trapezoid .. .. .	Red ..	1	1	..	..	..	..
Rectangular .. .. .	Red ..	1	1	..	..	..	..
Circular .. .. .	Red ..	1	1	..	..	..	..
Angular .. .. .	Red ..	..	..	..	..	..	1
	Yellow ..	..	..	..	1	1	..
Semi-circular or arc .. .. .	White ..	2	2	..	4	4	..
Anvil .. .. .	Red ..	..	..	..	1	1	..
	White ..	1	1	..	..	..	..
Pronged .. .. .	White ..	1	1	..	..	..	..
Bifurcated .. .. .	Yellow ..	..	..	..	1	1	..
Blobs .. .. .	Yellow ..	..	..	..	8	8	..
Indeterminate figures .. .. .	Red ..	..	..	..	4	4	..
	White ..	..	..	..	4	4	..
	Yellow ..	..	..	..	3	3	..
	Dark red ..	..	..	..	6	6	..
	Pinkish-buff ..	..	..	..	3	3	..
Bars or rods .. .. .	White ..	..	..	..	35	..	..
	Yellow ..	3	3	..	15	50	..
		..	1,020	7	..	339	5

Superimposition : Purplish-red under all others, red stencilled hands over dark red emu tracks, yellow stencilled hand over red bars, white over yellow and yellow over white hand stencils, white bars over yellow hand stencils.

The second alcove, 12 ft. long, 8 deep, 15 high, contains faded stencils of hands, 18 red, four white, of which one is on a red surface, and one yellow.

*Cave 19* : Subdivided into four alcoves, this shelter is some 60 yards further north-westward along the ridge and lower down the ridge face with a steeply sloping rocky floor. The first alcove has 13 red and three yellow stencilled hands, the second has 10 red and four yellow stencilled hands, white stencils of a human foot, an anvil-shaped and a semi-circular object ; the third has red stencils of 12 hands and an amputated emu's foot, yellow stencils of 15 hands and a boomerang ; the fourth has red stencils of a boomerang and a hand which is very faded and five red vertical parallel bars 7 in. long.

*Cave 20* : Forty feet long, 15 deep, 20 high, contains stencils of 40 hands in faded red, 24 in dark purplish-red varying from faded to fresh, a pair of 4-in.-long ovals in red ; in the middle of the shelter is a group of hands stencilled in fresh and perfectly preserved white, one of which includes the forearm. Adjacent is another in which index and middle finger are extended and the other digits closed, and finally a unique example of a hand in profile with fingers extended and thumb closed across palm. The white hands are superimposed over the reds. The rock has spalled away in the top eastern area, taking many stencils with it.

*Cave 21* : Ten feet long, six deep and high, this very concave alcove is a quarter-mile or so north-westward along the western portion of the ridge, separated by a series of rocky ledges from a rock waterhole 40 ft. below in the valley floor.

There are two pairs of emu tracks in red, a purplish red stencil of a child's hand under a bright red stencilled hand, two yellow over red hand stencils, trial splatter patches in red and a sequence of dark purplish-red over red over yellow over bright red stencilled hands.

Tabular analysis reveals an extremely limited number of styles among the paintings ; only six occur at Mootwingee out of a total of 31 known in Australia (McCarthy, 1958, 33-4). Stencils far outnumber all other styles ; monochrome silhouettes and linear figures are next in frequency ; outlines are rare. The few silhouettes of animals compare unfavourably with those in neighbouring areas, especially in the Darling River-Cobar-Bourke area figured by Black (1943) ; there are no unusual or complex figures in the linear series.

A wider range of subjects occurs among the stencils than has been recorded in any other one locality in Australia. Their styles and the limitation of the colours to monochromes are archaic elements in Australian cave art.

Analysis of Colours						Stencils	Others
Colour							
Red ..	..	..	..	..	..	853	101
White	..	..	..	..	..	76	194
Yellow	..	..	..	..	..	91	43
Orange	..	..	..	..	..	..	3
Brown	..	..	..	..	..	..	7
Pinkish-buff	..	..	..	..	..	..	3
						<hr/> 1,020	<hr/> 351

Red, which includes a range from faded to dark and purplish shades, is the predominant colour used at Mootwingee, as it is on Groote and Chasm Islands (McCarthy, 1955). In the Sydney-Hawkesbury district of eastern New South Wales there are 911 white, 300 red, 17 yellow and four black human hands and only eight feet recorded among the 1,330 stencils in 170 rock shelters, as against 200 other subjects in dry black pigment, 173 in red, 76 in white and none in yellow (McCarthy, 1958, 36, 39). Thus, although stencils predominate numerically in both eastern and western New South Wales, red was preferred in the west and white in the east. Black was not used at all in the west, yellow only for a very small number of stencils in the west and still less in the east. In two caves in south-west Arnhem Land (Macintosh, 1951, 1952) only 22 stencils (hands) occur among 94 figures ; of the stencils 20 are red, only two are white. There are also 25 red silhouettes on some of which are superimposed white silhouettes. The more recent figures are bi-chromes. A count was not made of stencils on Groote and Chasm Islands, but red is by far the commonest in these islands and in the north and interior generally. These differences in the uses of colours in techniques and regions may have important cultural implications in view of the existence of distinctive eastern and inland archaeological cultures (McCarthy, 1958, 185).

## SUPERIMPOSITIONS

The superimpositions do not indicate any distinct periods of styles and colours at Mootwingee. The main points are : (1) a few dark red silhouettes appear to be among the earliest paintings ; (2) yellow was used concurrently with, but more rarely than, red ; (3) the thick pasty-white kangaroo hunt in cave 2 is painted over and under red and yellow stencils and does not belong to the latest phase of painting in Big Cave, nor similarly with the same theme in cave 16 ; (4) the red stencils are consistently under the white ones, and white stencils become more common in the final phase of painting at Mootwingee ; (5) silhouettes and stencils are concurrent.

## AFFINITIES OF PAINTINGS AND ENGRAVINGS

Beckett (1958, 91) ascertained that the religion of the north-western or Corner tribes of New South Wales was closely related to that of the Lakes Tribes investigated by Elkin (1931, 53, 58, 60). Elkin said that the main features in the religion of the Lakes tribes were : (1) the possession, at least by all the northern tribes of the group, of a patrilineal totemism of the *talū* or increase type, in nearly all cases combined with a matrilineal totemism with which the members' sisters' sons were associated ; (2) sex totemism and dream totemism ; (3) a type of mythology in which the heroes are called Mura-mura, whose exploits took them from south-western Queensland to Eyre's Peninsula ; (4) the *wiljaru* rite, the highest stage of initiation, the outward sign of which is a pattern of cicatrization, consisting of two vertical rows of short parallel scars. It is notable that 23 out of 24 matrilineal social totems supplied by a Yantruwunta informant are edible, although the totemites did not eat of this totem. They ate freely of their patrilineal increase totem. The sex totem of the women is a small bush with milky sap, that of the men a small bush with a white flower ; they are referred to as mate or uncle and are play totems. Beckett (1958, 91) recorded that hair depilation and tooth avulsion (optional), circumcision in the *milia* ritual, and the high *wiljaru* took place in the initiation ceremonies of the Corner tribes. Such is the background of ritual and belief of the tribes in whose territory the Mootwingee engravings are situated.

An important criterion in determining the age of these pecked intaglios in Australia will be to establish and date accurately the archaeological horizon, which is a phase of the axe-making period, to which the pecking technique belongs. Pecking is an early Neolithic technique which probably diffused into Australia several thousand years ago. Distribution suggests original introduction in Cape York or Arnhem Land ; spreading over the greater part of the continent, its use in full rock engraving lagged behind that for fashioning stone implements. The Aborigines shaped axes, cyllons, percussion and grindstones, ceremonial stones, *Yodda* and *Ooyurka* tanged implements, picks, *tjuringa* (McCarthy, Bramell and Noone, 1946) by pecking throughout the huge region extending from north-western Australia through the Northern Territory and central Australia to Queensland, New South Wales and Victoria. It was only in a major part of Western Australia that the technique was not employed. Its use in rock engravings extended only as far south-east as western New South Wales and the Flinders Range in South Australia, but the Queensland limit is uncertain.

It is as yet premature to make a detailed comparative study of the chronology and distribution in Australia of the techniques and motifs among the pecked engravings. Mootwingee is the first extensive pecked intaglio site at which the recording of every motif has been attempted. Hall, McGowan and Guleksen (1951) provided a useful comparative study of the Pimba site, in South Australia, as did Worms (1954) for the Abydos and Wamerana sites in north-western Australia. Extensive sites like Yunta Springs, Salt Creek and others in the Flinders Ranges in South Australia, Sturt's Meadows and Koonawarra in western New South Wales, and others in central, western and northern Australia have not been studied in sufficient detail to provide adequate comparative data.

Worms (1954) concluded that a recent stratum of pecked engravings, which he called Gurangara petroglyphs, emanating from the desert tribes, overlaid an earlier outline stratum in the upper Yule River galleries. McCarthy, in 1958, established three phases of rock engravings at Port Hedland and on Depuch Island (McCarthy, 1961) which he has called the Outline, Linear Design and Pecked Intaglio phases. His discovery that the full intaglio pecking is the latest technique in rock engraving in this general region suggests that all of the pecked stone artifacts belong to the same late period in Australia's prehistory.

The following discussion is an attempt to explore the relationships and chronology of techniques, subjects and styles among the pecked engravings of South Australia and western New South Wales to ascertain whether the same sequences exist in this region and in north-western Australia.

Despite the wide distribution and large number of sites of rock paintings and engravings in Australia, very little attention has been paid to the problem of distinguishing the prehistoric figures and groups from the historic or those still functioning in the living culture of Aboriginal tribes. McCarthy (1955, 1958, 1959) has drawn attention to this problem, and working from superimpositions of figures, has denoted certain chronologies among the paintings on Groote and Chasm Islands, at Oenpelli in western Arnhem Land, and in eastern New South Wales.

Hale and Tindale (1930, 208-11) reported three series of engravings at Devon Downs on the lower Murray River in South Australia. The earliest series, which Tindale (1957, Fig. 1) allied with their Mudukian or earlier Pirrian periods (with a radiocarbon mid-period dating of  $4250 \pm 180$  B.P. years from the present time, consists of straight abraded grooves in both haphazard and radiate sets. These grooves are widely distributed in rock engraving sites of the interior of Australia generally, and form, apparently, the earliest series in existence. None were found at Mootwingee, but a small number exist at Sturt's Meadows and also at Port Hedland. The second series, belonging to the late Mudukian and early Murundian periods, consists of abraded or incised outlines of tortoises, fringed circles or "sun" designs, tailed and barred circles, bird tracks, very large U-shaped figures, wavy lines, and scores of pits or holes.

Basedow (1914, Pls. IIB, IVB, VB, VIB, VIIB, IXB, XA-B, XIII, XIVA) illustrated, but did not comment upon, an important series of superimpositions in two sites at Deception Creek in the Flinders Ranges. His photographs demonstrate that at these sites fully pecked intaglios of owls, human feet, lizards and other animals, tailed radiate figure and emu tracks, are engraved over circles with a thin punctured outline. The consistent superimposition of the full intaglios over the circles indicates that the latter preceded the former in the Flinders Range area. A number of these circles, together with outline tortoises and no intaglios, occur at Burra at the southern end of the Flinders Ranges, and form a good example of the Outline phase of engravings. Furthermore, in many of the Flinders Range sites plain circles are associated with a range of simple motifs which include linear emu and kangaroo tracks, single barred and linked circles, arcs, branching figures and others, which appear to form the earliest group of motifs among the interior engravings generally. They may be linked with the second series at Devon Downs and with the Burra series. Basedow's Pl. XIIA, at Yunta Springs, is a good example of this group of motifs, and he refers (op. cit., 198) to circles, wavy lines and emu tracks at a site in the Mann Ranges.

Another correlation is suggested. The motifs incised on the cylcons include various combinations of straight parallel lines in sets, which resemble the straight abraded grooves at various rock engraving sites mentioned above. On the cylcons there are also bird and kangaroo tracks, simple pittings or holes, cross, encircling rings, winding or spiral groove around the stone, radiate figure, barred circle, arc, oval, and an M-like figure (McCarthy, Bramell and Noone, 1946, 67). These motifs are characteristic of the abraded groove and linear design phases of engraving, indicating that the cylcon continued in use from the abraded groove to the linear design phases in Australia. Those fashioned by pecking and polishing, however, were made by techniques which obviously belong to a later period than the pre-axe Mudukian of Devon Downs, indicating that the stones continued in use into a comparatively recent period, e.g., they bear archaic designs from early phases of rock art, but those fashioned by pecking and polishing in later phases bear no pecked intaglio figures or designs.

The more complex line motifs, such as concentric full and half circles, spirals, snakes, apron, plume, grid, clusters, wheel, maze and line patterns, belong to an intermediate phase of rock engraving. We have noted at Sturt's Meadows the following series of superimpositions of full intaglios over linear designs (See Plate XXVI) :—

- Full intaglio lizard over line design.
- Full intaglio emu and kangaroo tracks, beside a sphere, over line design of radiate type.
- Full intaglio human foot over linear man or lizard.
- Full intaglio lizard over line design centred on small hole in rock.
- Full intaglio emu and kangaroo tracks over linear designs (four examples).
- Full intaglio emu and kangaroo tracks over cluster designs (four examples).
- Full intaglio emu tracks over complex line design.
- Full intaglio kangaroo track over spiral.
- Full intaglio kangaroo track thin outline circle.

Basedow illustrated (1914, Pl. XB) a full intaglio emu track over a wheel design at Deception Creek east, and we found a full intaglio conical figure (probably a kangaroo track) over a thin outline circle at Mootwingee. These superimpositions clearly indicate that the full intaglios are later than this group of line motifs ; many of the latter, complex in nature, form a group which may be considered a linear design or intermediate phase of engraving in the interior and north-west

of Australia. Very few of the motifs of this phase occur at Mootwingee, the concentric circle only once, but they are abundant at Sturt's Meadows. It is important to note, however, that the concentric circle and U, sets of sinuous parallel lines, radiate circle, grid, and other motifs of this phase of engraving are richly developed in the cave paintings, bccy ccccraton, ground drawings and portable ritual and secular art of central Australian tribes.

Hall, McGowan and Guleksen illustrated (1951, Pl. XXVII A) a full intaglio emu track over a branched design near Pimba. They refer (op. cit. 377) to the design as the "leaf fern" type of Mountford (1935), but make no comment about the superimposition.

At Mootwingee emu and kangaroo tracks are to be seen on practically every engraved rock surface. While the majority are natural size, some are smaller, but others are much bigger, those of the emu being up to 11 in. long and of the kangaroo up to 9 in. long.

One kind of emu track with the heel pad and the three toes clearly separated in the carving of it (Text. Fig. 4, No. 1, and Text. Fig. 2, Nos. 65, 69) is represented by a number of examples from small to large in size. It is the type recorded by Hall, McGowan and Guleksen (1951, 376) near Pimba, South Australia, and which, they suggested (op. cit. 379), indicated Aboriginal knowledge of footprints of a creature now extinct, and which, Tindale (1951, 381) suggested in a separate paper, opened up the distinct possibility that Australian man may have been contemporary with the extinct giant bird *Genyornis*. Tindale (1957, 40) again referred to these as probable tracks of giant birds, possibly from the Tartangan period.

As this track is in the full intaglio style which is the latest phase of pecked rock engraving in Australia, and identical examples can be seen where living emus have walked across claypans and sand, it is considered to be merely a variant of emu track. The emu track is a simple one to reproduce, but the heel pad is usually omitted in the engravings. Both the heel pad and one toe are commonly omitted in the hind foot track of the kangaroo, and very few of the forepaw tracks are shown among engravings. It is significant that the very large and full intaglio tracks of the kangaroo, with separated heel pad, long middle toe and one lateral toe, have never been doubted as representing the living species of euro or kangaroo, and no one has claimed, as with the emu tracks above, that they belong to an extinct species.

An important superimposition is that of a full intaglio radiate figure, with a tail, over broad intaglio banded circles, at both Deception Creek and Yunta Springs (Basedow, 1914, Pls. VIII B, XIV B). There is as yet insufficient evidence at hand to decide whether the broad intaglio bands preceded or are contemporary with the full intaglios, and it will be necessary to study long series of superimpositions to decide this point. Another important superimposition at Sturt's Meadows is that of full intaglio kangaroo tracks over triple circle (with thin lines) and over the body of a goanna. The body of the goanna bears widely scattered pits and this style of engraving may also belong to the intermediate phase. There are also superimpositions of full intaglios over one another at various sites.

From the evidence of superimpositions presented above, we are led to the conclusion that the full intaglios, which form the great majority of the engravings at Mootwingee, belong to the latest phase of engraving. Strictly speaking, the banded and full intaglios are the only strictly pecked engravings, the others being better described as having a conjoined punctured outline. Basedow (1914, 198) considered the full intaglios to be a more advanced type than the tracks and circles. It is possible that some of the complex line motifs were carried from the intermediate into the later full intaglio phase. The full intaglios portray human beings and their tracks, and various animals—kangaroo, emu, bandicoot, lizards, snakes, owl and others—and their tracks and eggs. We cannot as yet account for the emphasis upon naturalistic subjects in this phase, well exemplified at Euriowie, where emu and kangaroo hunts, snakes, lizards and men predominate in the full intaglio technique. It explains the comparative rarity of full intaglios in South Australia (McCarthy, 1958, 22) where the process of diffusion of these motifs was apparently in progress at the time of white occupation. A feature of the late intaglio phase of engraving is the portrayal of human feet, which are recorded at many sites in the Flinders Ranges, and in great numbers at Port Hedland (McCarthy, manuscript).

The little men hunting and fighting at Mootwingee are practically unknown in the Flinders Range sites. What appears to be a stickman carrying a boomerang or spear-thrower occurs at Panaramittee (Mountford, 1929, 343, Fig. 124), although he does not distinguish it as such. In no other pecked engraving site in western New South Wales are they so numerous as at Mootwingee. They are armed with up to three boomerangs in each hand, some carry spear and spear-thrower. McCarthy (1960, Figs. 63-70, 314) recorded them in 1958 on Depuch Island, north-western Australia, and further recording will probably reveal them in other localities. At Mootwingee they could well be regarded as spirits of the rocks, concerned mainly with the hunting of emus and kangaroos, bandicoots and lizards, collecting the vine berry or fruit, performing the various totemic increase, initiation and historical ceremonies featured at the site in times gone by, and living the same mode of life as the Aborigines, in a similar way to the Mimi

spirits of the rocks at Oenpelli in western Arnhem Land. The Bagundji tribe on the mid-Darling River had a belief in dangerous spirits called *mullas*, formerly a tribe which lived north of the Bagundji. They were pygmies with arms that reached to the ground, and on the men's elbows was a sharp hatchet-shaped bone which was thrust backwards when fighting. They were finally surrounded by the Bagundji and exterminated, and during this time they made the *kopi* caps to cool their burning heads. They now live in hollow rocks and small caves in the Macpherson Ranges, from where they wander at night in search of Bagundji natives travelling alone (Newland, 1888, 12-3). It may be pointed out that little men armed in hunting, fighting and dancing postures and scenes are commonly depicted in the rock shelter paintings south of the Darling River, in a triangle formed between Wilcannia, Cobar and Bourke, and also in the cave paintings of the Adelaide Hills. It is not yet known whether these little armed men form a separate phase not yet defined, or whether they have diffused widely as a part of the intermediate phase (because they are linear), or as part of the late pecked intaglio phase.

While the pecked intaglios of people and animals at Mootwingee are reasonably good examples of the pecking technique, they are not of a very high artistic standard. The lizards are simple linear stylisations, or broad lumpy figures. The emu, kangaroos and bandicoots are stiff in posture and lack anatomical details. The emphasis, however, at Mootwingee upon the motifs of emu eggs and chicks, and to a lesser degree upon the hunting of this great bird, and of the kangaroo, denote these animals, together with the bandicoot and the few other animals engraved, to be important totems of the area. The vine bearing a fruit or berry also comes within this category. Thus, although it can be claimed that the chief interest of the natives for whom Mootwingee was a sacred home was a small number of the principal foods upon which they depended, and for the increase of which they probably performed ceremonies similar to those of the Lakes tribes associated with the *mura* beliefs, there still remains an overwhelming interest at this site in the emu and the kangaroo. This may be related to the travels of heroes associated with these animals. The set of big pecked intaglios of two kangaroos, emu, bandicoot, and man all belong to a late period of engraving at this site; whether they form a related composition or not we cannot say, and just what relationship they have to the smaller figures around cannot be determined. The full significance of the widespread importance of the emu and kangaroo in Aboriginal rock art is not yet fully understood.

Linked with the totemic increase rites, and forming another major element in the local rituals, were the travels of the *mura* spirit-beings, which, in the arid interior of the continent, are usually associated with reliable or permanent waterholes. There are several probable representations of these heroes on the Dingo Rock.

Part of the initiation rites would therefore have been for the young men to visit the site and witness the ceremonies, and after their initiation to participate in the rituals themselves. It is unfortunate that the mythology and ceremonies of the Far Western and Corner tribes have not been recorded in detail.

Among other motifs at Mootwingee that might be mentioned are the boomerangs, which occur singly and in vertical sets of from two to four, a practice common to many techniques and phases of rock art in Australia as a whole. The stingray liver (Pl. XXIV., No. 14) probably came from the north, where it is a common motif in the rock art, and not from the south, where it is unknown. The tailed circle, also, is very widely distributed, and no doubt had many meanings in different localities, but the possibility must be considered of its having ultimately been derived from the outline stingray in northern Australian art. The little woman motif, with enlarged vagina represented as a single barred oval, is also known in northern Australian sites, including the upper Yule River (Worms, 1954), Oenpelli (Mountford, 1956), Depuch Island (McCarthy, 1961), and appears to have spread southward. The hollow-bodied men are recorded among paintings in the Kimberleys (Mountford, 1937) and at Conjola, eastern New South Wales (McCarthy, 1959), and among engravings on Depuch Island (McCarthy, 1961).

Sufficient evidence has been presented above to prove that diffusion has played an important part in the corpus of art motifs, styles and techniques in the western New South Wales and Flinders Ranges sites. Similar traits to those in these areas were spreading westward in north-western Australia, as Davidson (1952) pointed out. The point from which the diffusion emanated cannot as yet be decided because of our lack of knowledge of pecked rock engravings in the Northern Territory and the Kimberleys. Sites in central Australia, and on the Drysdale River, and many others, are as yet unrecorded. The available evidence suggests that from the (1) straight abraded grooves this art developed through (2) a simple group of outline animals and circles, tracks, boomerangs, etc., into (3) the elaborate and complex designs of concentric full and half circles, wheel, clusters, line patterns and many others, and finally into (4) the full intaglios of human beings, animals and their tracks.

Another approach that may be considered to enable us to interpret and elucidate designs at such sites at Mootwingee and Sturt's Meadows, where motifs and subjects differ so strongly, is that of Riddell (1928, 15) who thought that all areas had designs peculiar to them, and he cited the little men at Mootwingee as an example. This approach would account for the difference between the naturalistic motifs at Mootwingee and the predominantly symbolic art at Sturt's Meadows as being due to the sites belonging to different local groups, each allied with its own designs and rituals. Mountford (1957, 115) pointed out that certain types of designs tend to be used only in specific localities in the rock art of South Australia, citing human figures in the caves of the Adelaide Hills, circular designs of short lines at Yappala Hills, short lines at Gilmore Well, concentric U or half concentric circle at Mallett, and barred circles at Mt. Chambers Gorge, groupings which he thinks were probably totemic places not necessarily forbidden to the women. At small sites this interpretation is probably true, and at extensive sites like Mootwingee and others it is probable that specific motifs representing the totemic and ritual symbols of a number of local groups were of greater importance than others. It is also reasonable to believe, however, that the manner of representing the totems and cults may have changed during the different phases or periods of pecking distinguished above. New tribes, too, may have moved into an area and introduced their own motifs in the passage of time. When the same motifs are found engraved and painted over such a vast area of the continent as are those in the Abraded Groove, Outline, Linear Design and Intaglio phases of rock engraving, it is obvious that there has been a widespread diffusion of such motifs and that they have served many purposes as ritual symbols. To claim that no change has taken place in the pecked art at these sites would be unrealistic and contrary to the evidence available, because there is abundant data in the spread of the concentric circle *tjuringa* designs into western Queensland (Roth, 1897, Fig. 320), western and north-western Australia (Davidson, 1952) and of the Gunabibi-Djanba ritual and art in the northern Australia (Berndt, 1951, Worms, 1954) to show quite clearly that the tribal art has changed perceptibly, sometimes abruptly, in various parts of Australia in post-white times.

It is apparent that a detailed study is necessary at many sites of the superimpositions of techniques and motifs, and of the range and frequencies of motifs, in pecked engravings generally to elucidate some of the problems discussed above. Work should be directed also towards distinguishing the motifs of the various phases of engraving.

The relationship of the engravings to the paintings at Mootwingee is still indefinite and difficult to decide. Hale and Tindale (1925, 49-52) said that the same subjects are portrayed in both forms of art at Malkaia Springs, Oweiandanna and other sites in central Australia, and that Malkaia Springs ties up the intaglio carvings with the paintings in South Australia. As pointed out above, however, there are also striking differences between the paintings and engravings.

Very little data is as yet available from other sites of paintings in western New South Wales and none for South and Central Australia, about the important problem of superimposition of styles, colours, subjects and techniques. At Blackall (McCarthy, 1958, Fig. 16), in central Queensland, net-like figures form a late phase of painting. In eastern New South Wales stencils belong to the earliest phase of cave art, continuing into the hafted ground-edge axe period, that is, extending from the Bondaian into the Eloueran archaeological periods (McCarthy, 1959). When they ceased to be made is not known. So widespread is the stencil in Australia that detailed studies of its relative chronology are now essential to establish its position in the archaeological history of Australia.

The situation is not clear at Mootwingee. Here, an archaic art of stencilling is the main subject in the caves, concurrent with simple silhouette figures in one colour, and associated with the intermediate and late phases of rock engraving. Some writers (Black, 1943) are of the opinion that the paintings are not as old as the engravings, thus implying that engravings ceased at some indefinite date and that painting was continued until the coming of the white man. A similar idea has been expressed by Davidson (1936, 22) for Australia generally.

A mixed blood Wilyakali man told Elkin (1949, 140) that when he was a boy he did many of the stencillings in red, white and black at Mootwingee, and that there were many places in the district forbidden to women and children. Red and white are the predominant colours in the Mootwingee caves, but there are no stencils or drawings in black in them.

Black (1949, 106) said that he had not found any caves in which both engravings and paintings occur together, but caves 1, 4, 8, 11, 13, 14 and 16 at Mootwingee contain both forms of art, thus indicating that both forms were practised probably by similar people over some generations.

The emu and kangaroo hunting themes are common to both kinds of art, the former being the dominant one in the main gallery of engravings. While the tracks of both animals are common among the paintings and engravings, it is important to note that most of the motifs in the engravings are not painted in the caves where there was an overwhelming pre-occupation with stencilling, an archaic technique and subject for which there is no comparison among the engravings; but the subjects of the engravings in the caves are much the same as those in the outside galleries.

It is reasonable to argue that the subjects and techniques of the early period of outline and linear engravings, discussed above, may be correlated with the archaic stencilling in the caves at Mootwingee, but the presence of stencilled hafted ground-edge axes negatives this claim because this period of engraving is a pre-axe one. Hence, it can only be stated that at Mootwingee at some unknown period there occurred an emphasis upon pecked engraving, particularly of the full intaglio style, which continued for a very appreciable time. Paintings of the apron and three vertical bars (Big Cave), plant-like figure (cave 19)—all of which are engraved at Sturt's Meadows but not Mootwingee—emu and kangaroo tracks, silhouette of little men, various mammals and lizards, form a link with the engravings. The vertical sets of boomerangs occur among the stencils and also among the intaglio engravings, but this is a motif found in all periods and kinds of rock art in Australia.

From the mythological origin assigned to the engravings at Euriowie, which were said to have been made by the Seven Sisters who went up into the sky to live, Dow (1938, 102) and Barrett (1943, 60) suggested that the engravings in western New South Wales may have been the handiwork of a migration of natives down the Darling River, preceding the coming of those found there by white settlers. This situation may also have existed in South Australia, he thought, where various investigators (except Harney, 1953) have failed to find out anything about the engravings from the natives (op. cit., 149). Basedow (1914, 195) ascertained that when a visitor stated his intention to remove to Adelaide a rock bearing engravings of emu and dog tracks from Myrtle Station, Leigh's Creek, the local blacks destroyed it. Elkin (op. cit., 149) said that "we do know that the revelations made to the initiated consisted of the bullroarer myths, rituals and totemic sanctuaries consisting of heaps of stones, or buried or standing stones. If Aborigines questioned were as ignorant as they claimed and not merely secretive, it is possible that the petroglyphs in this area belonged to an earlier cultural stage before that marked by circumcision and subincision in initiation and by cult-totemism". He qualifies this opinion by saying that "it may have been the old men's explanation to a young fellow of what they or their fathers did". These statements were made from the social anthropologist's standpoint and prior to our discovery, as reported in this paper, that there have been several periods of rock engraving in western New South Wales and the Flinders Ranges. Mootwingee is outside the eastern limit of circumcision and subincision, and these customs do not form a cultural stage in the Bandjigali territory. Drawings of ritual head-dresses at Mootwingee appear to belong to the intermediate phase of engraving and there is no direct evidence to prove that increase ceremonies were performed at the site. There are no engravings or paintings of bullroarers. It is not possible to say when the stone heaps (Plate I) were made and used, and although their function could well have been that of totem-centres in cult-totemism, as in north-eastern South Australia (Elkin, 1931) and north-western Australia (Elkin, 1933), the evidence from eastern New South Wales is not clear. Stone heaps occur with the outline engravings, and figures of bullroarers are not uncommon among the Sydney-Hawkesbury district of eastern central New South Wales, where both traits apparently belong to the sky-hero cult; and although the outline engravings of this area strongly suggest totemism with increase rites, there is no direct evidence in existence to support this claim. Stone heaps are not always symbols of cult totemism, as Elkin (1933) and others (McCarthy, 1940) have shown.

Davidson (op. cit., 20) said that "in north Australia the natives profess ignorance of the carvings in the two sites where they have been noticed, although it is interesting to note that at Delamere they have ready interpretations consistent with explanations of similar figures in their paintings. It could be argued from this that they may be rationalising ancient carvings on the basis of the meanings of their own paintings, but it is nevertheless true that there is a basic similarity between the two, and this fact suggests a continuity of art tradition in this area. At all events, the carvings are no longer made".

Elkin (op. cit.) suggested that the engravings of western New South Wales may have been made at the time of the migration of the sky hero Ngurundere down the Darling River into the Yaralde country, and further, that they may be connected with the *mura-mura* cults. But we now have four periods of engraving to consider, and unless the mythology becomes more fully known, or archaeology supplies more data, correlation of engravings and cults will remain speculative.

It is doubtful whether the art of the sky-hero cult of south-eastern Australia is the source of the intaglio naturalistic art of the late phase at Mootwingee. It must be remembered that a drastic change was taking place in the art of south-eastern Australia (McCarthy, 1953). On the carved trees, weapons, skin cloaks, and initiation grounds of the Bora type, the concentric diamond, half diamond, and triangle, with parallel chevron and straight grooves, had become the paramount art. Its only recordings so far in rock art are several painted designs at Gundabooka (Black, 1943, Pls. 123-4) and The Meadows in central-western New South Wales, and a design on an engraved bird at Wollombi in the Sydney-Hawkesbury district (McCarthy, 1949, Pl. E., Fig. 1). There may be other examples not yet recorded. The important point to note, however, is that the concentric line figures in the engravings at Sturt's Meadows and Koonawarra and further

west are circles and half-circles, typical of the central Australian region, with none of the diamond and half-diamond figures. As this latter series of formal motifs was apparently replacing the older naturalistic art in south-eastern Australia, the situation was the direct opposite to that in western New South Wales and central and north-western Australia, where the naturalistic designs had replaced the complex line type. The intaglio naturalistic engravings appear to have diffused from the north through the central South Australia region and thence into New South Wales.

Our final conclusion is that at Mootwingee we have a site at which the stencil, silhouette and linear paintings cannot be separated by a study of the superimpositions. These archaic and simple techniques are associated at this site with three distinct phases of rock engravings, the Outline, Linear Design and Intaglio groups, one of which is the latest and most advanced on the continent. It is not possible to say as yet when either painting or engraving ceased in the area, but from the evidence of the implements obtained from cave 14, the beginning of both forms of art have a considerable antiquity. The superimpositions in western New South Wales reveal that the sequence of techniques and subjects is the same in South Australia and north-western Australia.

### STONE MOUNDS

Two large and two small mounds of stones lie along a 20° bearing, between 120 and 240 yards north of the Main Engraving Gallery (Plate XIX and map). Each has an identical type of conformation, a kidney-shaped oval the long axis of which lies along an east-west line. The stones are so arranged that a deep trough in the middle is bounded by heaped-up perimeteral walls of which, in each case, the southern convex wall is the highest, dropping uniformly via the convex side walls to a low northern concave wall, suggesting an opening, either entrance or exit, at the most concave part of the northern wall.

The largest mound is the most southern and is situated in a shallow basin-like depression on the plateau. The mound is 70 ft. in circumference, its southern wall is 4 ft. high and its northern wall 2 ft. high.

The second largest is the most northern and is situated on a pebbly ridge of the plateau. It is 60 ft. in circumference, its southern wall is 3 ft. high and its northern wall 1 ft. 6 in. high.

The two smaller mounds are intermediate in position between the two larger; they are 22 ft. in circumference, their southern walls are about 18 in. high and their northern walls about 9 in. high. They are being broken down by sheep and goats running over the plateau.

Mounds of this kind are widely distributed in western New South Wales (Black, 1950), both in association with engravings and with complex patterns of stones in lines and other shapes, and they also occur separately and in sets. Their function in the life of the Mootwingee tribes is unknown.

However, the identical conformation and relation to the cardinal points of the four mounds at Mootwingee indicate at least that they were deliberately so constructed by the Aborigines.

### STONE IMPLEMENTS

The Mootwingee area is studded with surface camp-sites. There are many of them on the banks of the creeks and on the flats through which Nootambulla Creek and its tributaries run. There are other camp-sites along the ridge followed by the main road back to Mootwingee Station, but those along the creeks on this property, in the vicinity of the paintings, were not as productive of implements as were those on the Nootambulla Creek flats. Most of them are along the tributaries of Nootambulla Creek, not along the main creek itself. Series of interest extend along the front of caves 5 to 14, and up Giles Creek to within 100 yards of the main gallery of engravings.

An excellent series of flake and blade implements was collected on camp-sites scattered all over the plateau north of Big Cave (see map). There are patches of soil carrying copes of trees all over this plateau, including pine and other species from which seeds were collected by the women for making into flour dampers. Many broken millstones were noted on these sites.

The camp-sites on the Nootambulla Creek flats and the above plateau have not, apparently, been collected on very intensively in the past, as enquiries at the National Museum of Victoria and the South Australian Museum revealed that neither Museum possesses surface collections specifically localised as Mootwingee. The camp-sites on Mootwingee Station and on the plateau in front of the Big Cave were probably the least disturbed until our visits. A few collectors have visited Mootwingee, and station people looking for their sheep have wandered all over the area. It is therefore impossible at this date to make a reliable analysis of the full range of implements, and of their frequencies, from Mootwingee generally.

Barrett (1929, 416) found an axe of unusual shape in the mud and ashes of a mound beside a pool above the main gallery, the mound he refers to evidently being a fireplace. Mr. H. M. Hale, Director of the South Australian Museum, has informed us that his Museum has no ground-edge axes or cylcons from Mootwingee, and that Dr. MacGillivray's collection of cylcons and axes in this Museum is loosely labelled Menindie. MacGillivray was one of the first naturalists to visit Mootwingee, and he may have collected implements of these types there. Mr. A. Massola, Curator of Anthropology at the National Museum of Victoria, also reports that there are no axes or cylcons from Mootwingee at that Museum, nor does the Australian Museum possess any axes from there. It is obvious that axes are rare in the area. Station hands often pick up the larger implements, like axes, cylcons, millstones and mortars, and we have no record of what implements of these types have been collected at Mootwingee in this manner.

We noted broken millstones on most of the camp-sites, and collected two complete examples—one a roughly flaked slab of local fine-grained sandstone 22 x 11 x 3 in. in size, used on both sides, the other a well made oval pecked example 19 x 10 x 3 in., used on one side. They were found near the base of the rocky ridge in which caves 16 to 21 are situated on Mootwingee Station. Mullers are plentiful, but mortars and pestles, and hammerstones generally, are scarce.

We collected a pecked sandstone cylcon, without any markings on it, in a creek bed (see map).

There is an inexhaustible supply of pebbles, from which the implement materials were derived, which lie in heaps and scattered aggregations all over the rocky outcrop and in the creek beds. This abundant source of stone undoubtedly added to the importance of Mootwingee in the eyes of the Aborigines.

Our collection of 430 nuclei, blocks, normal flakes and blades, points and microliths is a representative one. *Horsehoofs* are well represented among the nuclei, and trimmed blocks were found in normal numbers. In the normal flake and blade group the *tula* adze, with both *tula* and *Burren* type slugs (the latter as usual much scarcer than the former), formed the basis of the industry, in which there is a wide variety of scrapers on tongue-shaped blades and other flakes, and knives (none of the *Leilira* type), and a few burins. *Pirri* points were found all over the area, and among them are some of the unilateral *Adelaide*-type points. Microlithic scrapers, including thumb-nails, are abundant. A wide variety of geometrical types was collected, but as a group these implements are not abundant in the area.

#### EXCAVATIONS

Out of the 21 shelters containing paintings, only four contained floor deposits. When excavated, these all proved to be shallow.

The most productive site was cave 14. This had a flat floor deposit 10 ft. long and wide, consisting of a shallow over-burden of red sandy clay from 1 in. to 3 in. thick, lying on a grey ashy-sand deposit in which were found several fireplaces of fine black ash. The deposit began at the bottom of the wall at the back of the shelter, and became progressively thicker towards the middle of the floor. Four feet from the wall a deeper section of deposit filled a trough up to 18 in. deep in the rock floor. Trenches 2 ft. wide, dug the full length and width of the deposit in 1958, yielded four *tula* adze slugs, a geometrical microlith, and portion of a millstone. A further excavation of an area 7 ft. x 6 ft. was made in 1959, from which the following series of implements was recovered :—

		1-6 in.	7-14 in.	15-18 in.	
Scrapers :	side	4	3	2	9
	end	1			1
	double-side (reversed)		1		1
Tula adze :		3	2	1	6
Tula slug :		13	2	2	17
Burren slug :		3		1	4
Geometrical Microliths :	triangle	2			2
	trapezoid	1	1	1	3
	peaked semi-circle	1			1

		1-6 in.	7-14 in.	15-18 in.	
Burin :	scaled	1		1	
	plain		1	1	
Core :	irregular	1		1	
Block :	oval crown	2		2	
	concave : end and side	1	1	2	
	fragments	5	1	6	
Microlithic scrapers :	side	2	1	3	
	end		1	1	
	thumbnail	4		1	5
	core fragments	2			2
	end and side (crown)	1			1
Millstone :	(flaked)	1		1	
		48	14	8	70

The majority of the implements came from an area between 2 in. and 14 in. deep. The deepest part of 15 in. to 18 in. occurred at the bottom of the trough. About one-third of the implements are microlithic in size. The scrapers and *tula* range from  $\frac{7}{8}$  in. to  $1\frac{3}{8}$  in. long, and the slugs from  $\frac{13}{16}$  in. to  $1\frac{3}{8}$  in. long. The bigger oval block is  $2\frac{3}{4} \times 2 \times 1\frac{1}{2}$  in. in size. Two of the *tula* slugs are true microliths  $\frac{3}{4}$  in. long, another one  $\frac{7}{8}$  in., and a *Burren* slug is  $\frac{15}{16}$  in. The scaled burin is a perfect example of its type,  $\frac{7}{8}$  in. long.

The specialised types of implements, which include the *tula* and its two slugs, and the microlithic scrapers, are evenly distributed throughout the deposit. The industry found in this shallow homogeneous deposit may be regarded as belonging to one cultural horizon.

The apron or ledge outside this cave is a slight slope 30 ft. wide, and implements were collected all over it for the full length of the cave, which is also 30 ft. long. This area is covered thickly with small pebbles and broken quartz, among which were found *tula* adze blades, *tula* and *Burren* slugs, a quartz geometrical microlith, and a variety of scrapers some of which are of microlithic size.

Cave 9 had a floor deposit 8 ft. x 3 ft. in size, of a grey to black ashy-sand from 6 in. to 9 in. thick. It yielded part of the rim, a piece 3 in. x 2 in. in size, of a millstone, but no other implements.

Four areas were dug out in cave 15, which is 106 ft. long and 30 ft. wide. Sections, 6 ft. x 4 ft. in size, of grey ashy-sand 6 in. to 9 in. thick yielded few unused flakes only. Along the drip-line were found two *tula* slugs, a microlithic discoid scraper, and a microlithic end and side scraper. Lying on the surface was found a large mortar 13 x 10 x 2 in. in size, made from a slab of local sandstone; it has a working depression on both sides.

Similarly, the deposit in cave 16 was sterile, but along the drip-line were found several *tula* adze-slugs, a small discoid scraper, and untrimmed chips.

Thus, the range of implements from the rock shelter deposits is the same as on the surface camp-sites in the normal flake and blade and microlithic series. This range links the site with the Pirrian phase of the Devon Downs (Hale and Tindale, 1930) and Fromm's Landing (Mulvaney, 1960) sites. Radiocarbon dates (for which charcoal has been collected) will decide whether the Mootwingee site belongs to the early, middle or late phase of the above periods. That this phase may be of some antiquity is revealed by the fact that the geometrical microliths are prehistoric in the Lower Murray Valley, where they were used between approximately 5000 and 3500 B.P. years ago (Mulvaney, 1960, 72, 78). The *tula* and its slugs were used continuously from the Tartangan, with a mid-point dating of 6020 B.P., through the Pirrian phases of the Devon Downs and Fromm's Landing sites in the Lower Murray Valley.

Although no ground-edge axes are known from the Mootwingee area, evidence is available to show that later lithic cultural elements existed in the district. We collected a pecked cyllon and a pecked millstone, and noted broken pieces of other pecked millstones and mullers. They raise the problem of whether or not the intermediate linear phase of engraving is linked with the cave art and implements, and the late intaglio engraving with the cyllon and millstones, as they are all fully pecked.

Thus, a key problem to be solved respecting Mootwingee is the correlation of the cave paintings and rock engravings with the stone implement cultures. Periods or horizons exist in both the engravings and implements, but our data are as yet insufficient to decide their relationships.

### SEQUENCE OF WORK, AND ACKNOWLEDGMENTS

One of us (F. D. McC.) spent a week at the site in October, 1955, when Mr. Geoff Johnson, a Trustee of the Australian Museum, kindly provided transport and funds for a Museum research party to visit far western New South Wales. Both authors together visited this site and Sturt Meadows in April-May, 1958, in company with Messrs. O. le M. Knight, D. Walker, I. Stewart and V. Bolton, of Sydney, who assisted in implement collecting, site finding and in excavating caves 15, 16 and 9, which were sterile in implements, and cave 14, where an exploratory trench revealed implements. Both authors again visited the site in November, 1959, in company with Mr. G. Williams, Laboratory Technician, Department of Anatomy, University of Sydney, who assisted in a second more extensive excavation of cave 14, in taking Hornex impressions of rock engravings and in making compass surveys of the total terrain. On this occasion also Mr. George Dutton, our Aboriginal informant, was interviewed in Wilcannia. Our thanks are expressed to the Deputy Commissioner of Police in Sydney, Mr. N. Allan, and to Sergeant E. Madden and Constable M. Salisbury, of Wilcannia, for locating Mr. Dutton and for providing facilities for the interviews and recording.

One of the authors (N. W. G. M.) and Mr. G. Williams returned to Wilcannia in March, 1961, and again in July, 1961, to obtain more information from Mr. Dutton and to re-check the terrain. Our thanks are expressed to Sergeant F. M. Marshall and Constable J. Donohue, of Wilcannia, for similar help. Our thanks are also due to a number of pastoralists for their assistance and kindness; these include Mr. Lee Smith, of Mootwingee Station, Mr. and Mrs. A. R. Bevan, of Sturt Meadows, Mr. and Mrs. W. Gaul, of Langawirra, Mr. and Mrs. R. Langford, of Waterbag, Mr. and Mrs. F. Barraclough, of Boorungie, and also the Barrier Field Naturalists' Club, through its President, Mr. T. P. Hackett.

Financial coverage of expenses was provided by the Australian Museum and by the Department of Anatomy, University of Sydney.

In technical work, Text Figs. 3-9 were arranged by F. D. McC., the line drawings for which were made by Miss Jannelle Bailey, technical assistant, Australian Museum. Plates 1-14, Text Fig. 2 and the map were prepared by N. W. G. M. Photographic reconstruction and printing of all illustrations were prepared by Mr. G. Williams, and the typescript was prepared by Miss A. Scot Skirving and Miss B. Mackel, Department of Anatomy, University of Sydney.

### LIST OF REFERENCES

- Barrett, C. 1929. Cave Hunting and What We Saw. *Aust. Mus. Mag.*, 3, 414-9.  
 ———— 1929. The Primitive Artist. *Australian Aboriginal Art*. National Museum of Victoria.
- Barrett, C., and Croll, R. H. 1943. *Art of the Australian Aboriginal*.
- Basedow, C. 1914. Aboriginal Rock Carvings of Great Antiquity in South Australia. *J. Roy. Anthrop. Inst. Gt. Brit., Irel.*, 44, 195-211.
- Beckett, J. 1958. Marginal Men: A Study of Two Half-caste Aborigines. *Oceania*, 29, 91-108.
- Biddle, J. P. H. 1925. Aboriginal Markings on Rocks near Koorringa (Burra), South Australia. *Tr. Roy. Soc. S. Aust.*, 49, 121-2.
- Black, R. L. 1943. *Aboriginal Art Galleries of Western New South Wales*. Leeton, N.S.W.  
 ———— 1942. *Cyllcons*. Leeton, N.S.W.  
 ———— 1949. Notes on the Material Culture of the Aborigines of the Darling River Valley. *Mankind*, 4, 102-7.  
 ———— 1950. *Stone Arrangements*. Leeton, N.S.W.
- Bonney, F. 1883. On Some Customs of the Aborigines of the River Darling, N.S.W. *J. Anthropol. Inst. Gt. Brit., Irel.*, 42, 122-37.
- Breuil, H. 1952. *Four Hundred Centuries of Cave Art*. Montignac.
- Brown, A. R. 1931. Social Organisation of Australian Tribes. *Oceania Monograph*, 1.
- Cameron, A. L. P. 1884. Notes on Some Tribes of New South Wales. *J. Anthropol. Inst. Gt. Brit., Irel.*, 14, 344-70.
- Campbell, T. D. Detailed Notes on the Aboriginal Intaglios near Koorringa (Burra). *Tr. Roy. Soc. S. Aust.*, 49, 123-7.
- Campbell, W. D. 1899. Aboriginal Carvings of Port Jackson and Broken Bay. *Mem. Geol. Surv. N.S.W. Ethnol.* 1.

- Davidson, D. S. 1934. Australian Spear Traits and Their Derivations. *J. Polyn. Soc.*, 43, 41-72, 143-62.  
 \_\_\_\_\_ 1936. Aboriginal Australian and Tasmanian Rock Carvings and Paintings, *Mem. Amer. Phil. Soc.*, 5.  
 \_\_\_\_\_ 1952. Notes on the Pictographs and Petroglyphs of Western Australia. *Pr. Amer. Phil. Soc.*, 96, 76-117.
- Dow, E. B. 1937. *On the Burke and Wills Track*. Broken Hill. Pamphlet.
- Dunbar, G. K. The Ngemba Tribe of the Central Darling River, Western New South Wales. *Mankind*, 3, 172-80.
- Elkin, A. P. 1949. The Origin and Interpretation of Petroglyphs in South-eastern Australia. *Oceania*, 20, 119-57.  
 \_\_\_\_\_ 1931. The Social Organisation of South Australian Tribes. *Oceania*, 2, 44-73.  
 \_\_\_\_\_ 1933. Studies in Australian Totemism. *Oceania Monograph*, 2.
- Hale, H. M. and Tindale, N. B. 1925. Further Notes on Aboriginal Rock Carvings in South Australia. *S. Aust. Nat.*, 10, 30-4.  
 \_\_\_\_\_ 1930. Notes on Some Human Remains in the Lower Murray Valley, South Australia. *Rec. S. Aust. Mus.*, 4, 145-218.
- Hall, F. J., McGowan, R. G. and Guleksen, G. F. 1951. Aboriginal Rock Carvings, a Locality near Pimba, South Australia. *Rec. S. Aust. Mus.*, 9, 375-9.
- Harney, W. E. 1952. Peck-Marked Carvings and Sign-Talk. *Mankind*, 4, 345-6.
- Howitt, A. W. 1904. *The Native Tribes of South-Eastern Australia*. MacMillan, London.
- Keast, A. 1959. Australian Birds : Their Zoogeography and Adaptations to an Arid Continent. *Monographiae Biologicae*, 8, Den Haag.
- Kelly, C. T. 1935. Tribes of Cherbourg Settlement, Queensland. *Oceania*, 5, 461-73.
- Kenny, E. J. 1934. West Darling District : A Geological Reconnaissance. *N.S.W. Geol. Surv., Mineral Res.*, 36.
- Kreff, G. 1865. Manners and Customs of the Aborigines of the Lower Murray and Darling. *Tr. Phil. Soc. N.S.W.*, 1862-5, 359-74.
- Lingard, J. 1846. *Narrative of a Journey to and from New South Wales*.
- Lithgow, G. W. 1961. *Mootwingee, Broken Hill*.
- McCarthy, F. D. 1939. The Aboriginal Rock Paintings of N.S.W. *Aust. Mus. Mag.*, 7, 50-6.  
 \_\_\_\_\_ 1940. Aboriginal Stone Arrangements in Australia. *Aust. Mus. Mag.*, 7, 184-9.  
 \_\_\_\_\_ 1949. Records of Rock Engravings in the Sydney District, 39-40, *Mankind*, 4, 61-7.  
 \_\_\_\_\_ 1953. The Oceanic and Indonesia Affiliations of Australian Aboriginal Culture. *J. Polyn. Soc.*, 62, 3, 243-61.  
 \_\_\_\_\_ 1955. Notes on the Cave Paintings of Groote and Chasm Islands. *Mankind*, 5, 68-75.  
 \_\_\_\_\_ 1957. *Australia's Aborigines : Their Life and Culture*. Colorgrature Publications Ltd., Melbourne.  
 \_\_\_\_\_ 1958. *Australian Aboriginal Rock Art*. Australian Museum, Sydney.  
 \_\_\_\_\_ 1958. Aborigines : Rock Engravings. *Aust. Encyc.*, 1, 79-82.  
 \_\_\_\_\_ 1958. Culture Succession in South-Eastern Australia. *Mankind*, 5, 177-90.  
 \_\_\_\_\_ 1959. Cave Art of the Conjola District, N.S.W., *Rec. Aust. Mus.*, 24, 191-202.  
 \_\_\_\_\_ 1959. Methods and Scope of Australian Archaeology. *Mankind*, 5, 297-316.  
 \_\_\_\_\_ 1959. Rock Engravings of the Sydney-Hawkesbury District, Pt. 2, *Rec. Aust. Mus.*, 24, 203-16.  
 \_\_\_\_\_ 1960. The Cave Paintings of Groote and Chasm Islands. *Rec. Amer. Aust. Arnhem Land Exp.*, 1948, 11, Art. 6.  
 \_\_\_\_\_ 1961. The Rock Engravings of Depuch Island, North-West Australia. *Rec. Aust. Mus.* 25, 121-148.  
 \_\_\_\_\_ 1961. The Story of the Mungan or Bagadjimbiri Brothers. *Mankind*, 5, 420-5.  
 \_\_\_\_\_ The Rock Engravings of Port Hedland (manuscript awaiting publication).
- McCarthy, F. D.; Bramell, E.; Noone, H. V. V. 1946. The Stone Implements of Australia. *Mem. Austr. Mus.* IX.
- Macintosh, N. W. G., and McCarthy, F. D. 1951. Archaeology of Tanandjal Cave, South-west Arnhem Land. *Oceania*, XXI : 178-213.
- Macintosh, N. W. G. 1952. Paintings in Beswick Creek Cave, Northern Territory. *Oceania* XXII, 256-274.
- Massola, A. 1960. On the Western Australian Kodja. *Pr. R. Soc. Vic. N.S.*, 72, 2, 87-92.
- Meston, A. L. 1932. Aboriginal Rock Carvings in Tasmania. *Pap. Pr. Roy. Soc. Tasm.*, 1-6.
- Mountford, C. P. 1929. Aboriginal Rock Carvings in South Australia. *Rept. Aust. Adv. Sci.*, 19, 337-66.  
 \_\_\_\_\_ 1935. A Survey of the Petroglyphs of South Australia. *Rept. Aust. Assoc. Adv. Sci.* 22, 208-15.  
 \_\_\_\_\_ 1955. An Unrecorded Method of Aboriginal Rock Markings. *Rec. S. Aust. Mus.*, ii, 345-52.  
 \_\_\_\_\_ 1956. Art, Myth and Symbolism of Arnhem Land. *Rept. Amer. Aust. Arnhem Land Exped.*, 1948, 1.  
 \_\_\_\_\_ 1937. Examples of Aboriginal Art (recorded by G. Hill) from Napier, Broome Bay and Parry Harbour, North-Western Australia. *Trans. Roy. Soc. S. Aust.*, 61, 30-40.  
 \_\_\_\_\_ 1957. Aboriginal Cave Paintings in South Australia. *Rec. S. Aust. Mus.*, 13, 101-15.
- Mulvaney, D. J. 1959. Dating of Australian Prehistory. *Nature*. Sept. 19, Suppl., 918.  
 \_\_\_\_\_ 1960. Archaeological Excavations at Fromm's Landing on the Lower Murray River, S.A. *Pr. R. Soc. Vict. N.S.*, 72, 2, 53-85.
- Newland, S. 1888. The Parkengees or Aboriginal Tribes on the Darling River. *Pr. Geogr. Soc. S. Aust.*, 2, 20-32.  
 \_\_\_\_\_ 1926. *Memoirs. Paving the Way*.
- New South Wales Government. Papers, 1883-1915.
- Petri, H. E. and Schulz, A. 1951. Felsgravierungen aus Nordwest—Australien. *Zeitschr. f. Ethnol.* 76, 70-93.
- Pulleine, R. H. 1926. Rock Carvings and Cave Paintings at Mootwingee, N.S.W. *Tr. Roy. Soc. S. Aust.* 50, 180-2.
- Riddell, P. D. 1928. Rock Carvings at Mootwingee. *Vict. Nat.*, 45, 14-5.
- Roth, W. E. 1897. *Ethnological Studies Among the North-West-Central Queensland Aborigines*. Govt. Printer, Brisbane.
- Stokes, J. L. 1846. *Discoveries in Australia. H.M.S. Beagle, 1837*, 43, 2.

- Tindale, N. B. 1939. Eagle and Crow Myths of the Maraura Tribe, Lower Darling River, N.S.W., *Rec. S. Aust. Mus.*, VI, 243-60.
- 1940. Distribution of Australian Aboriginal Tribes. *Tr. Roy. Soc. S. Aust.*, 64, 140-231.
- 1951. Comments on Supposed Representations of Giant Bird Tracks at Pimba, South Australia. *Rec. S. Aust. Mus.*, 4, 381-2.
- 1957. Culture Succession in South-Eastern Australia from Late Pleistocene to the Present. *Rec. S. Aust. Mus.*, 13, 1-49.
- Troughton, E. 1957. *Furred Animals of Australia*. 6th edition. Sydney.
- Worms, E. A. 1954. Prehistoric Petroglyphs of the Upper Yule River, North-western Australia. *Anthropos.*, 49, 1067-88.

## EXPLANATION OF PLATES

PLATE XIX.—Fig. 1 : “Big Cave” and the plateau. Fig. 2 : From the top of “Main Gallery” looking south to ridge containing caves 5-14. Nootambulla Creek flats and site of surface implements in the middle. Figs. 3 and 4 : Stone mounds north of “Main Gallery”. Fig. 5 : Caves 15-17 (see map). Fig. 6 : “Main Gallery”. Note the angle of slope and the fracture crevices isolating the slabs. Fig. 7 : Do. Note also trees growing in the fracture crevices, and the boulder superimposed on one slab (Dingo Rock). Six smaller rocks intervene between the boulder and the underlying main slab, leaving a space between the two. Fig. 8 : Illustrates the magnitude and nature of the fractures. The depths of the crevice reveal a fresh unbroken surface. Lamination of the slabs can be seen.

PLATE XX, Dingo Rock—Fig. 1 : Shows the engravings occupying the lower two-thirds of the slab. The fissuring of the surface is well demonstrated. The composition of massed figures includes repetition of several motifs. Fig. 2 : Shows the slab with a superimposed boulder ; two small sections of rock, presumably derived from this boulder, lie end-on in the crevice at its south-western margin. Note the blackened south-eastern surface. Figs. 3 and 4 : Show motifs similar to those on Dingo Rock, but they are on adjacent surfaces separated by the fractures at the south-west margin of Dingo Rock.

PLATE XXI—Five examples of repetitive portrayal of single motifs : Fig. 1 : Identified by informant George Dutton as a Rain-Making Group. Fig. 2 : Tiny men with tall conical head-dresses identified as *kungulada*, of south-west Queensland, by George Dutton. Fig. 3 : Tiny female figures. Fig. 4 : Barred hollow-bodied men. Fig. 5 : Some hundreds of various tracks, said by George Dutton to represent an incident from the Eaglehawk-Crow Myth.

PLATE XXII—Repetitive examples of a particular motif (emu egg) throughout the Galleries.

PLATE XXIII—Repetitive examples of a particular motif (kangaroo and kangaroo tracks) throughout the Galleries. There are also various portrayals of humans and weapons.

PLATE XXIV—Motifs which are scarce at Mootwingee occurring sporadically on the Galleries.

PLATE XXV—Unchalked illustrations of various pecked figures.

PLATE XXVI—Illustrates some of the superimpositions recorded at Sturt Meadows and described in the text.

PLATE XXVII—Varieties of the dingo motif described in text : Nos. 1 and 2 illustrate the Cult Hero or *mura* ancestor on Dingo Rock. No. 1 is a photograph, distorted by obliquity, of the completely chalked-in rock engraving. No. 2 is an orthogonal photo of a Hornex impression, free from distortion. Collectively, the two cover the text description. No. 3. Mr. George Dutton, our informant. No. 4. Three standing dingoes, one (?) sitting dingo, and one (?) dingo sniffing right foot of armed man. No. 5. Engravings chalked in outline only. No. 6. Orthogonal photo of Hornex impression. Group includes one item identified as snake and one as dingo. No. 7. Isolated engraving of dingo showing five legs or four legs and a penis.

