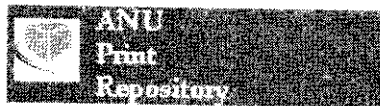


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Rock Paintings by the
Aborigines in Caves on Bulgar
Creek, near Singleton

Article author:
R. H. Mathews

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Mean places of the Comparison Stars for the beginning of the Year of Observation—*continued*.

Star.	α	δ	Authorities.
	h. m. s.	" " "	
7	12 17 44.00	-24 14 27.6	Cape Cat. 1850, 2221; Yarnall, 5260; Stone 6885.
8	12 31 58.47	-26 32 28.7	Arg-Oeltzen 12289-90; Yarnall, 5365; Quetelet 5169; Stone 7000; Greenwich Cat. 1880, 1971.
9	12 30 33.99	-26 49 57.0	Arg-Oeltzen 12270; Wash. Mural Cir. Zone 112, 21.
10	12 37 46.40	-27 35 30.3	Arg-Oeltzen 12368; Wash. Merid. Tr. Zone 234, 2; Wash. Mural Cir. Zone 105, 123.
11	12 38 15.16	-27 43 51.0	Cape Cat. 1850, 2276; Arg-Oeltzen 12377; Wash. Merid. Tr. Zone 234, 3; Wash. Mural Cir. Zone 105, 124; Yarnall, 5413; Greenwich Cat. 1880, 1988; Stone 7043.
12	12 41 4.74	-28 23 40.1	Wash. Merid. Cir. Zone 92, 66; Wash. Mural Cir. Zone 164, 9.
13	12 41 35.59	-29 0 3.9	Wash. Merid. Cir. Zone 91, 91.
14	12 41 53.91	-29 12 19.6	Arg-Oeltzen 12420; Wash. Merid. Tr. Zone 116, 22; Wash. Merid. Cir. Zone 91, 92.
15	13 17 4.89	-32 37 29.7	Stone 7332.
16	13 20 20.52	-33 26 30.8	Stone 7359.
17	13 31 22.79	-34 29 59.3	Yarnall, 5713; Stone 7462.
18	13 31 36.57	-34 30 46.5	Yarnall, 5714; Stone 7466.
19	13 42 42.84	-35 9 33.4	Yarnall, 5782; Stone 7556.
20	13 47 14.23	-35 7 49.7	Cape Cat. 1850, 2471; Yarnall, 5829; Stone 7604.
21	13 59 28.61	-37 12 42.2	Yarnall, 5916; Stone 7711.
22	14 4 39	-37 24	Equatorial.
23	14 13 59.42	-37 23 18.3	Yarnall, 6016; Stone 7821.
24	14 29 43.05	-39 7 41.2	Yarnall, 6119; Stone 7945.
25	14 57 46.86	-40 26 27.4	Stone 8189.
26	15 2 28	-40 46	Equatorial.
27	15 3 2	-40 47	Equatorial.
28	15 23 12.52	-41 32 55.4	Stone 8421. Brighter component employed.
29	15 39 57.31	-41 51 57.2	Stone 8564.
30	15 44 10	-41 59	Equatorial.
31	15 46 10	-41 57	Equatorial.
32	15 47 57.15	-42 17 14.0	Stone 8635.
33	15 55 24	-42 12	Equatorial.
34	15 56 29	-42 11	Equatorial.
35	16 11 50.85	-42 24 40.0	Stone 8860.
36	16 19 43	-42 13	Equatorial.
37	16 46 26.85	-42 11 0.6	Cape Cat. 1850, 3129; Stone 9160.
38	16 46 53.48	-42 18 4.2	Cape Cat. 1850, 3135; Stone 9169.
39	16 53 33.26	-41 54 37.2	Stone 9242.
40	17 6 15	-41 31	Equatorial.
41	17 13 34	-41 27	Equatorial.
42	17 17 12	-41 24	Equatorial.
43	17 24 10.60	-40 57 22.9	Stone 9537.
44	17 26 43.99	-40 56 50.1	Stone 9565.
45	17 41 14.70	-39 51 33.8	Stone 9683.
46	17 42 42.09	-40 3 18.2	Cape Cat. 1850, 3338; Stone 9707.
47	17 49 22	-39 55	Equatorial.
48	17 52 53.12	-39 14 13.9	Stone 9798.
49	18 5 3.14	-39 21 53.1	Stone 9904.
50	17 50 15.98	-39 5 7.0	Stone 9772.
51	17 52 33	-39 3	Equatorial.
52	18 5 33.62	-39 10 51.7	Stone 9908.
53	18 13 49.99	-39 3 59.7	Stone 9990.
54	18 16 13	-38 54	Equatorial.
55	18 23 55.75	-36 52 51.4	Yarnall, 7982; Stone 10078.
56	18 26 42.46	-36 27 12.8	Wash. Mural Cir. Zone 49, 3.
57	18 32 6.85	-36 19 12.5	Wash. Mural Cir. Zone 49, 5.
58	18 38 8.06	-35 57 47.2	Yarnall, 8087; Stone 10194.
59	18 37 9.40	-35 44 46.3	Sydney Obs. 1859; Stone 10183; Melbourne, 934.
60	18 25 23.61	-35 25 28.3	Wash. Merid. Tr. Zone 44, 47; Yarnall, 7993; Stone 10083.
61	18 29 16.22	-35 31 51.8	Wash. Merid. Tr. Zone 44, 48.
62	18 32 30.96	-35 23 8.9	Wash. Merid. Tr. Zone 44, 49.
63	18 33 9	-35 15	Equatorial.
64	18 35 22	-35 15	Equatorial.
65	18 40 39.78	-32 49 31.5	Wash. Mural Cir. Zone 25, 77.
66	18 42 4.10	-32 49 42.0	Wash. Mural Cir. Zone 25, 78; Cape Cat. 1850, 3668; Stone 10228.

Mean Places of the Comparison Stars for the beginning of the Year of Observation—*continued*.

Star.	α	δ	Authorities.
	h. m. s.	" " "	
67	18 46 44.56	-32 7 14.4	Cape Cat. 1850, 3692; Wash. Mural Cir. Zone 25, 79; Stone 10275.
68	18 39 38	-32 1	Equatorial.
69	18 41 26.05	-31 58 50.0	Wash. Merid. Tr. Zone 30, 79.
70	18 36 21	-31 44	Equatorial.
71	18 40 15.97	-31 51 10.2	Wash. Merid. Tr. Zone 30, 78.
72	18 35 1.46	-31 34 39.3	Wash. Mural Cir. Zone 39, 24; Yarnall, 8063.
73	18 36 20.49	-31 44 21.8	Yarnall, 8072.
74	18 37 42.78	-31 33 25.8	Wash. Mural Cir. Zone 39, 26.
75	18 22 23.15	-29 24 49.6	Wash. Mural Cir. Zone 261, 18; Wash. Merid. Cir. Zone 97, 167.
76	18 22 23.35	-29 19 27.2	Wash. Mural Cir. Zone 261, 19; Wash. Merid. Cir. Zone 97, 168; Yarnall, 7972; Quetelet 7504; Stone 10061.
77	18 13 37.08	-29 6 35.7	Wash. Mural Cir. Zone 27, 62; 261, 11; Wash. Merid. Cir. Zone 97, 162; Arg-Oeltzen 18945.
78	18 25 25.66	-29 15 53.4	Arg-Oeltzen 18329; Wash. Mural Cir. Zone 261, 22; Wash. Merid. Cir. Zone 97, 170; Yarnall, 7997; Quetelet 7540; Stone 10088.
79	18 21 41.06	-28 50 40.2	Wash. Mural Cir. Zone 47, 9; Yarnall, 7962.
80	18 23 44.00	-28 51 54.6	Cape Cat. 1850, 3582; Arg-Oeltzen 18291.2; Wash. Mural Cir. Zone 47, 10; 182, 25; Yarnall, 7981; Stone 10076.
81	18 10 36.52	-28 19 8.3	Cape Cat. 1850, 3517; Wash. Merid. Tr. Zone 51, 33; Wash. Merid. Cir. Zone 117, 134; Yarnall, 7880; Stone 9965. Declinations very discordant; probable proper motion in declination.
82	18 15 13.89	-28 28 41.6	Cape Cat. 1850, 3540; Wash. Mural Cir. Zone 27, 63; 117, 138; Wash. Merid. Cir. Zone 94, 90; Wash. Merid. Tr. Zone 51, 33; Yarnall, 7914; Stone 10092.
83	18 5 51.94	-28 15 38.6	Cape Cat. 1850, 3493; Arg-Oeltzen 17893; Wash. Mural Cir. Zone 117, 130; Wash. Merid. Tr. Zone 51, 29; Yarnall, 7826; Stone 9913. Wash. Mural Cir. Zone Declin. rejected.
84	18 8 53.96	-28 6 41.4	Arg-Oeltzen 17896; Wash. Mural Cir. Zone 117, 132; Wash. Merid. Tr. Zone 51, 32.
85	18 10 13.59	-27 44 49.3	Cape Cat. 1850, 3513; Yarnall, 7870; Stone 9960.
86	18 10 51.40	-27 54 7.8	Arg-Oeltzen 17964; Wash. Mural Cir. Zone 45, 13.
87	17 24 53.22	-23 52 41.7	Cape Cat. 1850, 3313; Arg-Oeltzen 16877.8; Yarnall, 7407; Stone 9514.
88	17 24 42.19	-23 34 27.4	Arg-Oeltzen 16873.4.
89	17 22 22.15	-23 21 8.0	Arg-Oeltzen 16826.

ROCK PAINTINGS BY THE ABORIGINES IN CAVES ON BULGAR CREEK, NEAR SINGLETON.

By R. H. MATHEWS, Licensed Surveyor.

[With Plates XVIII. - XX.]

[Read before the Royal Society of N. S. Wales, October 4, 1893.]

ABOUT eighteen months ago I was engaged on some extensive surveys under the Real Property Act in the Parishes of Whybrow and Milbrodale, about fifteen miles from Singleton, and whilst so employed my attention was drawn to the existence of some caves.

in the vicinity, containing aboriginal drawings. Being anxious to obtain all the information I could on the subject, I got some of the residents to act as guides, and visited two of the most interesting of these caves. Thinking that the result of my inspection may be of some interest to the members of this Society, I have prepared a few notes, with illustrative diagrams, which I will now place before you.

I will first deal with the cave shown on Plate 19. This cave or rock-shelter, is a large overhanging ledge of Hawkesbury Sandstone on the west side of Bulgar Creek, a tributary of the Wollombi Brook, and is situated within Portion No. 2 of six hundred and forty acres, in the Parish of Milbrodale, County of Northumberland, about a quarter of a mile southerly from the old road from Sydney, over the Bulgar Mountains, to Singleton, and is about fifteen miles south-westerly from the latter town.

The cave or shelter, is in one of the ordinary low rocky escarpments of the Hawkesbury Sandstone which are very numerous in this part of the district; the direction of the escarpment being north-westerly, and the dip north easterly. The cave is about eighty feet above the adjacent valley, and faces the north-east, consequently the sun shines into it, on fine days, all the year round. There is also a good drainage from the front of the cave, which keeps it dry and free from moisture. The shelter is about fifty-eight feet long, and is twenty-three feet high from the ground to the top of the ledge, the depth from the front to the back of the interior being twenty-two feet at the widest part. The thickness of the overhanging rock at the front is about three feet, gradually getting thicker as it goes back. The floor of the cave is, in places, sandstone, *in situ*; in others, disintegrated sand, but too shallow for burials to have taken place. There is no trace of any hearth-rubbish, leading to the belief that the recess has not been used to any great extent as one of residence.

I will now proceed to briefly describe the figures. Standing in front of the cave with the face towards it, the most prominent object is the grotesque figure of a man about eight feet high, with

the arms and legs extended, and out of all proportion to the rest of the body. It is generally supposed by old colonists who have been a good deal among the aborigines in the early days of the Colony that the figure of a man represents either a good or evil spirit, and generally were those who presided over the ceremony of the *Bora*. The figure in this cave, having the legs and arms fully extended, seems to represent a man lying on the ground. It is known that, at the ceremonies of the *Bora* some of the aboriginal tribes were in the habit of making a colossal figure of a man on the ground with sticks, and covering them over with earth, so as to show the outline distinctly. Such a figure represented *Baiamai*, or the Great Spirit. In front of this cave there is a large level valley, timbered with large and lofty trees, well suited for a *Bora* ground, and I think it more than probable that *Boras* were held here, and that the figures in the cave are connected with the ceremonies which took place on such occasions. There was plenty of good water in the Bulgar Creek close by, and good hunting grounds all around.

But to proceed with our description of the figures. On either side of the body, just below the arms, there are perpendicular lines about eight or nine inches long, three being on the right hand side, and four on the left. It is not clear what these lines are supposed to represent, but I think a very feasible theory is that they are intended to show the upper ends of spears, the lower ends being on the ground, with their tops resting against the rock. Close to the body on the right hand side is a native tomahawk with handle, and on the left, a boomerang, with another boomerang a little further to the left. A short distance below the right hand there is another tomahawk with handle, and what appears to be intended for a waddy. There are four impressions of hands in the immediate vicinity of the figure of the man, and one hand and a boomerang at some distance, in the upper left hand corner of the cave. It will thus be seen that all the figures in this cave consist of one rude drawing of a man, seven spear heads, three boomerangs, two tomahawks, and a waddy. The plate shows all

these drawings exactly as they are in the cave, being accurately drawn to scale from actual measurements, and in the proper colours.

The figure of *Baiamai*, or Devil Devil, or whatever the image represents, is drawn in red, by a number of strokes drawn in the direction of the different limbs, not one mass of red colour, and appears to have been done with some red substance held in the hand. The apple tree, and also the grass tree of Australia, yield a red gum or resin, which has the property of staining anything with which it comes in contact when in a wet state. The eyes, and the lower part of the body of the man, are drawn in white.

The seven perpendicular marks, which we have supposed to be the upper ends of spears resting against the rock, are drawn in a whitish grey colour, probably with a white stone held in the hand. All the rest of the figures are drawn in what has been called the "stencil" or "splash-work" method. These drawings appear to have been made by placing the extended hand, or other object, flat on the rock, and then squirting a whitish colour over it by means of the mouth, or in some other manner. It will be observed that three of the hands in this cave are right hands, which is rather unusual in these rock drawings, the impression being generally that of the left hand.

After the "splash-work" drawing was completed, some dark substance appears to have been applied to the rock within its margin, because all the splash work figures in this cave are darker than the surrounding sandstone. The height of the lowest of these figures above the floor of the cave is about four feet, and that of the highest about twelve feet.

I was informed by Mr. W. G. McAlpin, who is now eighty-four years of age, and has resided in the neighbourhood for the last fifty years, that the figures in this cave were there when he first came to the district; and even at that time the drawings were beyond the knowledge of the local blacks. Mr. McAlpin further states that the figures on the rock are now in about the same state of preservation as when he first saw them upwards of fifty

years ago, having suffered very little in that time. It may be mentioned that the Hawkesbury Sandstone is not very durable, even under the most favourable circumstances, and when located in damp situations, and subjected to much moisture, it crumbles away rapidly. It is owing to the very favourable situation of this cave, pointed out in the early part of this paper, that its walls are now apparently in very nearly the same state as when the drawings were made upon them.

Going on now to describe the drawings shown on Plate 20, which is drawn to the same scale as Plate 19, it will be observed that they are not so interesting as those we have first noticed; the cave is not so large, and the drawings are confined to impressions of the hand. This cave is situated on Crown land, in the Parish of Whybrow, County of Hunter, on the south side of Bulgar Inlet, a tributary of the Wollombi Brook, about a mile south-westerly from Thomas Hayes' forty acres, being Portion 34 in the Parish just named. The cave is on the side of a hill facing the north-east, about one hundred and fifty feet above the level of the creek, and about one hundred yards back from it. It is in one of a number of large rocks a little way above the sandstone escarpment which bounds the creek, which bears at this place nearly east and west. There is good natural drainage, and the sun shines into the cave from sunrise till past mid-day, thus keeping it very dry. The cave is about sixteen feet long, and extends back into the rock about nine feet; it is about five feet high inside, but on account of its dome shaped interior, is only about four feet at the entrance. The formation of the rock containing the cave is sandstone conglomerate. The figures are drawn on the back wall of the cave, near the roof, and are in an excellent state of preservation. There are ten hands altogether, all being left hands, with the exception of one. Each hand is of the dirty yellowish-brown colour of the surrounding sandstone, but the surface of the rock, outside the margin of the figures, is smeared with a whitish or ash-coloured substance after the manner of "splash-work," which causes the figures to stand out in relief.

As a rule, very little more than the hand is ever depicted in the native drawings, and the hand with part of the arm attached is considered very rare. It will be observed that two of the figures in this cave show the arm as far as the elbow, which makes them unusually interesting.

Mr. W. G. McAlpin who resides on the Wollombi Brook about three miles from these caves, told me that he used to know of another cave with aboriginal drawings on its walls, similar to those which I have been describing, some miles further to the westward, but of late years the rock in which the cave was situated, has fallen over on its face covering the entrance to the recess in which the drawings appeared.

The practice of rock painting by the aborigines has been observed from the time of the earliest explorers and is universally distributed over Australia, having been observed in different parts of New South Wales, in Queensland, and in Western Australia, but there appears to have been very little attention paid to it.

I have confined myself as much as possible to descriptions only of these drawings, and have not attempted to connect them with the myths and superstitions of the Australian aborigines; neither have I speculated on their supposed totemic or symbolical meanings. I have left these researches for those better qualified to follow them out than I am, or have more time at their disposal.

I have prepared a plan (see Plate 18) drawn to scale, which shows the correct position of the caves with regard to the nearest purchased lands, with the names of the Parish and County in which each is situated, so that anyone wishing to visit them can do so with facility.

ON THE PROBABILITY OF EXTRAORDINARILY HIGH
SPRING-TIDES ABOUT THE DECEMBER
SOLSTICE OF 1893.

By JOHN TEBBUTT, F.R.A.S., &c.

[*Read before the Royal Society of N. S. Wales, November 1, 1893*]

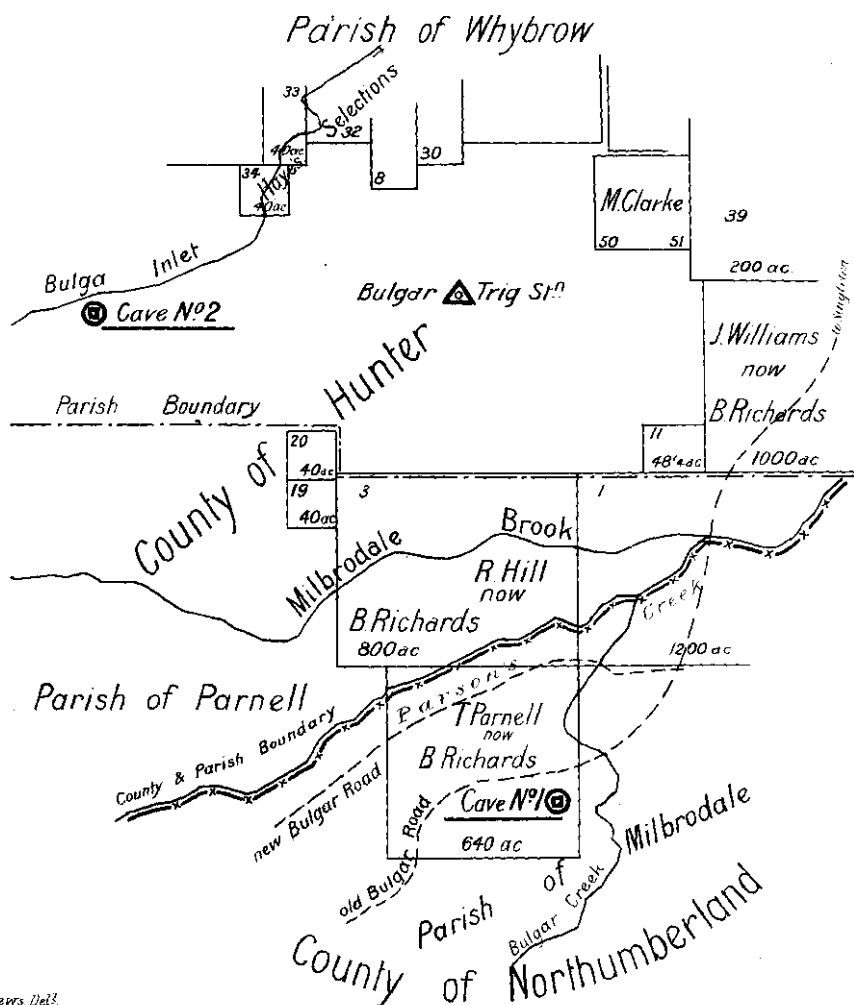
A BRIEF paper by me on the High Tides of June 15 - 17th 1889, was read before the Royal Society on July 3rd of that year, and published in the twenty-third volume of the Society's Journal. It treated of the extraordinary tides which occurred at and near Sydney, at the period referred to, and of the astronomical conditions which combined to produce them. It also referred to another instance of the registration of a very high tide by the Fort Denison gauge on May 26, 1880, and stated the astronomical conditions to which that tide was also due. During a few moments of leisure from my ordinary observatory work, my attention was drawn to a consideration of this interesting subject, and as a result, I found that the approaching summer solstice would present conditions much more favourable for the production of high tides than even those referred to in my former paper.

It is well known that there are two astronomical conditions which are especially favourable for the production of high tides, namely, the conjunction or opposition of the moon and her passage through her perigee. Speaking of the earth generally, we expect that if the new or full moon occur simultaneously or nearly so with her perigee passage, there will be an unusually high tide. But if we speak of Sydney in particular, there is another condition which sometimes coincides with those just mentioned, and which has a very marked effect on the magnitude of the tide wave. I refer to the moon's maximum declination. When I treated of the conditions which combined to produce the tidal phenomena that formed the subject of my former paper, I showed the close

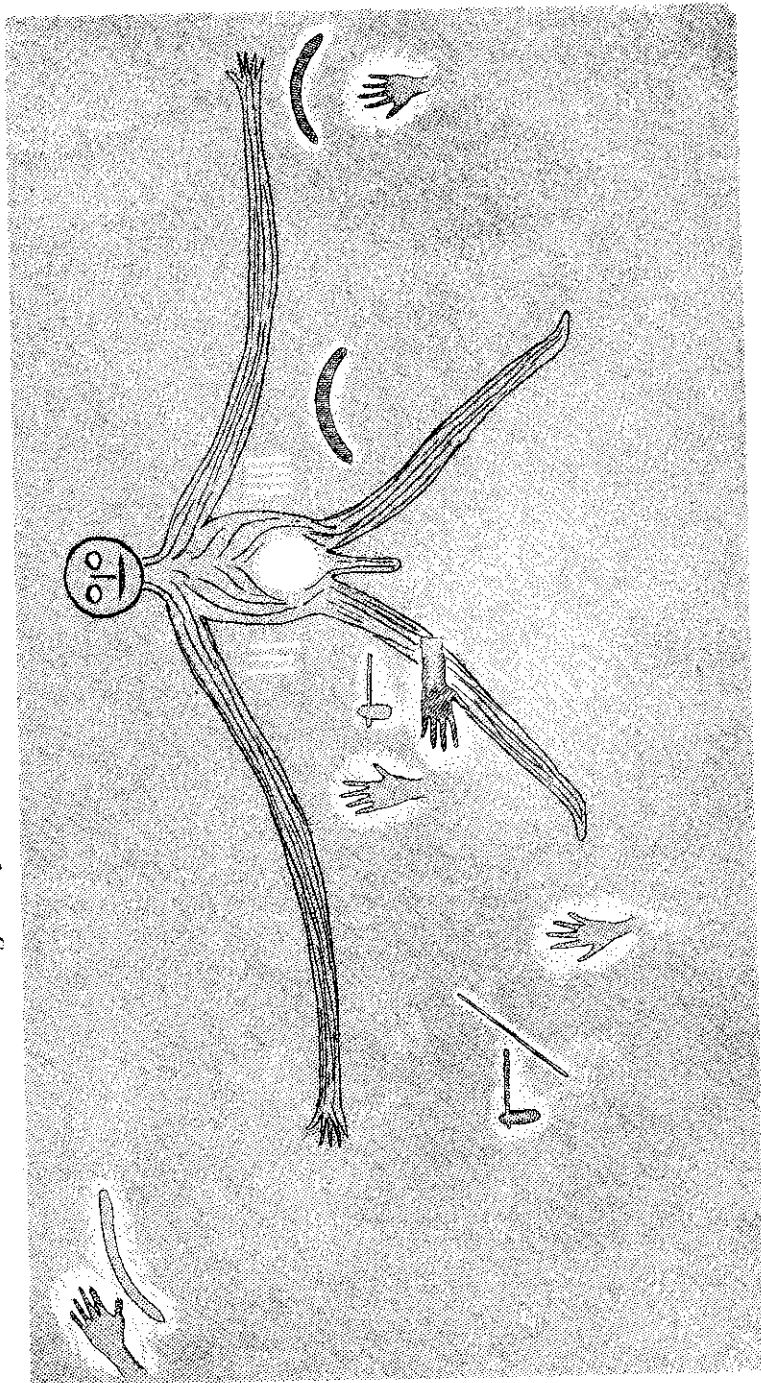
PLAN

*showing Position of Caves
Parishes of Whybrow & Milbroadale
near Singleton.*

Scale—80 Chains to an Inch



Drawings by Aborigines in Cave N°1.



Scale ~ 3 feet to an Inch

Drawings by Aborigines in Cave No 2.
Scale:— 3 feet to an Inch.



R.H. Matthews Del.