

DEPARTMENT OF MINES, SYDNEY.

RECORDS

OF THE

GEOLOGICAL SURVEY OF NEW SOUTH WALES.

Vol. III.]

1892.

[Part 1.

I.—Description of the Belubula Caves, Parish of Malongulli, Co. Bathurst* : By the late C. S. WILKINSON, L.S., &c., Government Geologist.

[Plates I–III.]

THE Belubula Caves are on the purchased land of the old “Belubula Copper Mining Company,” and are situated two miles north of the main road from Carcoar to Canowindra, eighteen miles from Carcoar, and about the same distance in a north-easterly direction from Cowra, Parish of Malongulli, Co. Bathurst.

The locality is one of much interest. High hills, with declivitous rocky spurs, descend on either side of a picturesque valley to a clear running creek, which flows with a tortuous course for about two miles, and then joins the Liscompool Creek. Some of the hills are composed of a dark porphyritic rock, an igneous rock, which, in the Devonian Period, upheaved and tilted those thick strata of limestone, whose grey rugged masses, out-cropping at the surface, form such an attractive feature in the landscape. The effect of atmospheric influences on exposed limestone rocks is here beautifully shown. The pinnacled crests and grooved surfaces of these rocks reveal in unmistakable characters the furrowing action of rain during the present and a past age. It is amongst these strangely weathered rocks, on the side of one of the limestone spurs, not far from the creek, that the three newly-discovered caves occur.

* Extracted from the *Sydney Town and Country Journal*, Sept. 9, 1876, p. 419.



Two of the persons who found these caves accompanied me, and directed my attention first to the "Deep Cave." This consists of an almost vertical pit, the opening of which is only about three by six feet. We descended by means of a rope for forty feet, on to a ledge of rock; from this we saw that the chasm opened out to twenty feet in width and fifty feet in length, and continued to a considerable depth, as indicated by the stones which we rolled into it, but having come to the end of our rope we could not descend further. We also saw a large cavernous opening towards the south-west, leading off probably to another long, vertical pit of unknown depth, the mouth of which occurs about one hundred yards higher up the hills; into this we could not enter with the means at our disposal.

We next proceeded for about two hundred and seventy-five yards in a southeasterly direction to the "Bone Cave," the entrance to which faces towards the east, and is twenty feet wide and six feet high, but it appears originally to have been much larger. Immediately within the entrance the cave is almost blocked up with masses of rock fallen from the roof; but, by crawling over and squeezing between them, we descended about twenty-five feet, and came to a large vertical hole fifteen feet deep, hung round with ornamental stalactites; in places the sides were formed of red calcareous earth, from which numerous bones protruded (Pl. III). From the bottom of this hole we passed for six feet between walls covered with stalactites, and entered a cavern fifteen feet by twenty-four feet and ten feet high. From its roof hung beautiful stalactites, some round and pointed, and others in wavy folds like white curtains with serrated edges. Part of the floor is formed of four separate layers of stalagmite, underneath which is red earth full of fragments of bones, mingled together in a confused state. I had a large quantity of these bones collected, some of which were embedded in the hard crystalline stalagmite. On the east side is an opening nearly choked up by stalactites and red earth; it is too small to enter, but we could send stones rolling down it for a considerable distance. Not being able to go any further in this cave, we climbed up, and scrambled over the piles of rock *débris*, and returned to daylight, and proceeded to explore the "Long Cave," the mouth of which is forty-four yards south from the Bone Cave (Pl. I). Descending a perpendicular hole for six feet between craggy masses of limestone rock, we entered a passage and walked along it till we suddenly came to a small opening, which we crawled through on all-fours into a room fifteen feet wide and eight feet high. But to pass from this we had to resort to more primitive means of locomotion, by squeezing into a hole only thirteen inches high and two feet wide, and sliding down it for six feet on one's back, or on whichever side was best proof to the probing stalactites, contact with which was not always agreeable. At the foot of this incline is a thin layer of stalagmite, and through a hole broken in it we got down, and again on all-fours crawled beneath it for thirty-six feet, and then entered a long

cavern thirty-five feet high. The wall of it on the north side rises with an irregular sloping surface to the roof, and is, as it were, covered with white tracery. From the roof hang numerous stalactites, and there is one of them very fine, being upwards of six feet in diameter and eighteen feet long; it is deeply fluted and resembles the pipes in front of a large organ. From projecting ledges around the walls hang beautiful white stalactites of various lengths. They suggest the idea of petrified cascades, which in reality they are.

At the northern end this cavern branches off into two—one extending to the north-west for sixty feet, and it evidently continued further, but is now filled up with red earth full of fragments of bones; the other forms a high passage one hundred feet long, leading into a lofty and spacious chamber seventy feet in width. Here are to be seen two remarkable stalagmites eighteen inches in diameter and six feet high, they are pointed at the apex and conjoined at the base, and stand on a conical mound of stalagmite (Pl. II.) Immediately over them, and on one side, hang some beautiful curtain stalactites, descending from the roof in drapery-like folds, gracefully disposed.

When well lighted up the contrast of these white stalactites against the dark, sombre, grey limestone walls presents a very striking and weird appearance. A huge fissure extends across the roof, and probably communicated overhead with two open caverns in the surface of the hill. Out of these a strong draught of air issues, and they are doubtless the cause of the good ventilation of the main parts of the "Long Cave." From the large cavern there are seven passages branching off in various directions, and leading into other smaller chambers. In nearly all of these fresh objects of interest and attraction are exhibited. The small "Fountain Chamber" has a white floor with ornamental cavities filled with clear water from which has been formed those calcite crystals which sparkle on the sides of the cavities. In some of the caves where they have been filled with this lime water, the walls are coated with these crystals. Another small cavern, rather difficult to get into, has a mound of white stalagmite with a tracery-marked surface, meeting which, and hanging in the centre are two stalactites covered with translucent spikes curving in all directions. These singular stalactites are seen in some of the other caverns; also groups of long radiating crystals of arragonite.

We could not explore to the end of some of the passages, owing to the foul air met with, which, if we had inhaled it, would have extinguished our lives, as it immediately did our candles.

In almost all of the caverns there are two, sometimes more, layers of stalagmite both above and below which the red earth and fossil bones are found. The caves appear to have been once filled with this bone earth, which is of such a nature as

to show that it has been drifted into the caves by water, and then partly washed away again to some lower level, probably down to some of those deeper passages into which we could not enter on account of the foul air in them.

It is possible there may have been other entrances to these caves, but which are now filled up by rock *débris*, certain depressions in the surface of the hill may indicate where they existed.

The origin of these caverns is apparent. Natural joint-fissures in the limestone beds received the surface-water, which, with the aid of the carbonic acid gas contained in it, dissolved the limestone rock and in process of time these subterranean water-courses gradually became enlarged to their present dimensions. But this took place at a period when the configuration of the surface of the land was different from what it now is. The very hills where the entrances to the caves now are, were once the bottom of valleys.

At that time the present valleys were not scooped out of the land surface, and these caverns then received the drainage. So that where is now the top of a hill a valley existed, and hills then stood where valleys now lie. But owing to the variable nature of the geological formations, the harder rocks resisted the denuding atmospheric influences, while hills of rock more readily disintegrated, had to yield to the gouging hand of time, and thus the land surface was ever changing till its present features were formed.

The miniature hills and valleys seen on those grooved, weathered, limestone rocks, before mentioned, well serve to illustrate these effects of denudation.

During these changes the original entrances to the cave have doubtless been removed, and in this way may have disappeared those places of resort which were frequented by some of the animals, whose bones were drifted into their present sepulchre.

But little surface-water can now enter these caves,---the *débris* of stones, earth and bones, appears to have been drifted in, chiefly during the Pleistocene Period.

Mr. E. Ramsay, F.L.S., Curator of the Australian Museum, has identified some of the bones as belonging to the genera *Macropus* (large Kangaroo), *Phascolomys* (Wombat), *Halmaturus* (Wallaby), and *Protomnodon*, an allied extinct genus. Several other bones may prove to be of new species.

The Belubula Caves were first explored by Messrs. T. J. Peters, T. and J. O'Shaughnessy, and A. Potts, road contractors.

I saw several depressions and holes in the limestone rocks in the vicinity, which probably lead into other subterranean chambers.

About half-a-mile in an easterly direction from the caves is the shaft of the Belubula Copper Mining Company. It has been sunk following a breccia-quartz reef, two feet thick; the quartz contains the grey sulphide and carbonates of copper sparingly distributed through it, also calcite. The reef traverses porphyritic diorite and dips S. 20° W. at 62°. It is probably auriferous.

Near the Belubula River on Mr. W. M. Rothery's Estate, and about three miles north from the Caves, there is a hot spring, from which, Mr. Rothery informed me, that a volume of water at a temperature of 88° Fahr. issues at the rate of about seven hundred gallons per minute. That it contains lime in solution is evident from the calcareous tufa deposited from it. This spring is said to have been running in the same manner ever since it was discovered, more than thirty years ago. It is, no doubt, an outlet for the water collected by some of the numerous caves in this limestone country, the water becoming heated in its passage through the rocks at considerable depths.

II.—*Hymenocaris Salteri*, M'Coy, m.s. : by R. ETHERIDGE,
Junr., Palæontologist and Librarian.

[Plate IV.]

I.—*History.*

As early as 1861, Sir F. M'Coy determined a Crustacean from the Graptolite Shales of Victoria as *Hymenocaris Salteri*,* but no description was offered, the Professor contenting himself with the following remark—"The characteristic genus *Hymenocaris* of these ancient beds in Wales also occurs here in a peculiar species, *H. Salteri* (M'Coy)."

The name has appeared in print at intervals since then, but after a lapse of thirty years, I believe, it still remains a M.S. name. The second occasion on which Professor M'Coy referred to his fossil appears to have been in the Second Edition of his "Ancient and Recent Natural History of Victoria,"† and a third time in a list of Victorian fossils contributed to the "First Annual Report" of the Second Geological Survey of Victoria,‡ by the late R. Brough Smyth. By Bigsby, the species was twice catalogued in his laborious compilation "Thesaurus Siluricus,"

* The Ancient and Recent Natural History of Victoria. *Vict. Intercul. Exhib. Essays*, 1861, p. 102.

† *Ann. Mag. Nat. Hist.*, 1867, XX, p. 201.

‡ P. 33 (r. 8vo. Melbourne, 1874).



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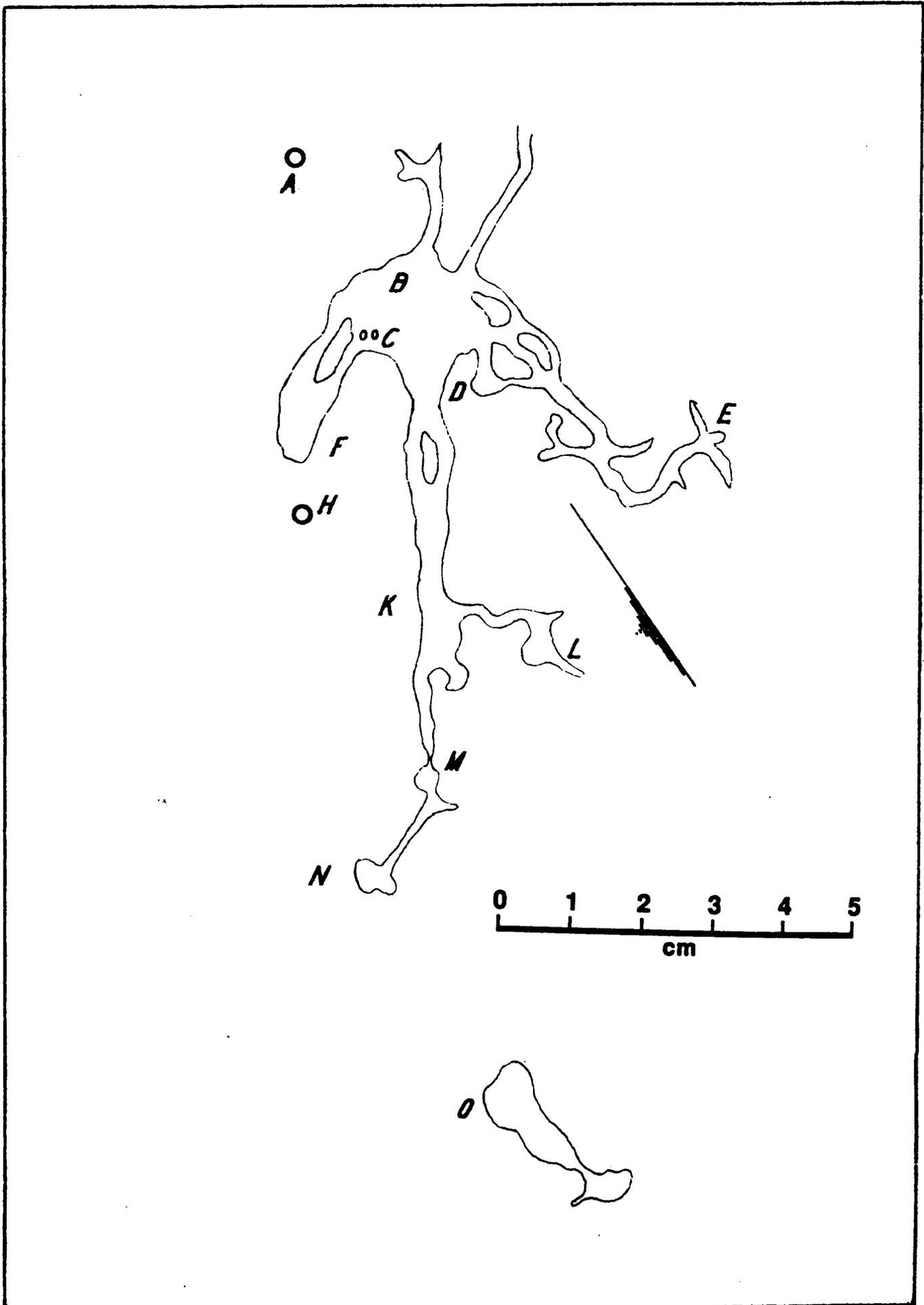
PLATE I.

Sketch plan of the Belubula Caves, by the late Mr. C. S. Wilkinson, Parish of Malongulli, Co. Bathurst.

- A. Surface hole whence issues air from the cave below.
- B. Large cavern about eighty feet below surface of hill.
- C. "The Twins," remarkable stalagmites.
- D. "Fountain Cave," containing water.
- E. Circular hole in roof of the cavern.
- F. Cave blocked up with masses of rock and earth.
- H. Surface hole, whence issues a current of air from below.
- K. Cavern, thirty-five feet high, containing some very fine stalagmites and stalactites.
- L. Thick deposit of red earth with bones.
- M. Narrow passage.
- N. Entrance to "Long Cave."
- O. Entrance to "Bone Cave."

[Reproduced from an illustration in the *Sydney Town and Country Journal*, September 9, 1876.]





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PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

PLATE II.

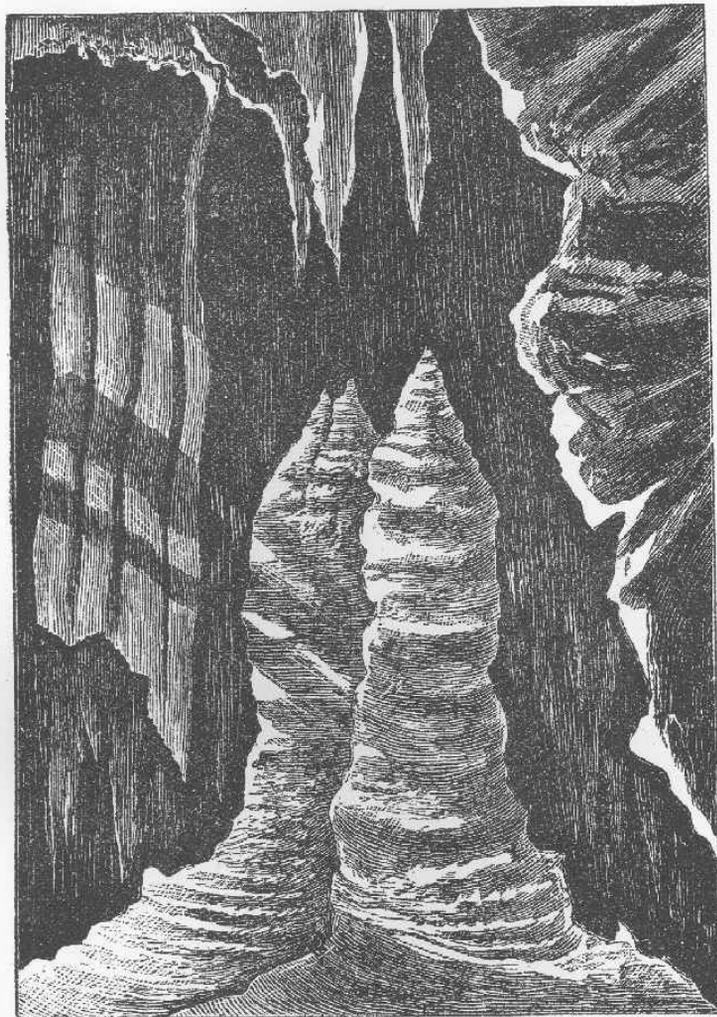
Stalactites overhanging two stalagmites, six feet high, Belubula Caves, Parish of
Malongulli, Co. Bathurst.

[Reproduced from an illustration in the *Sydney Town and Country Journal*,
September 9, 1876.]

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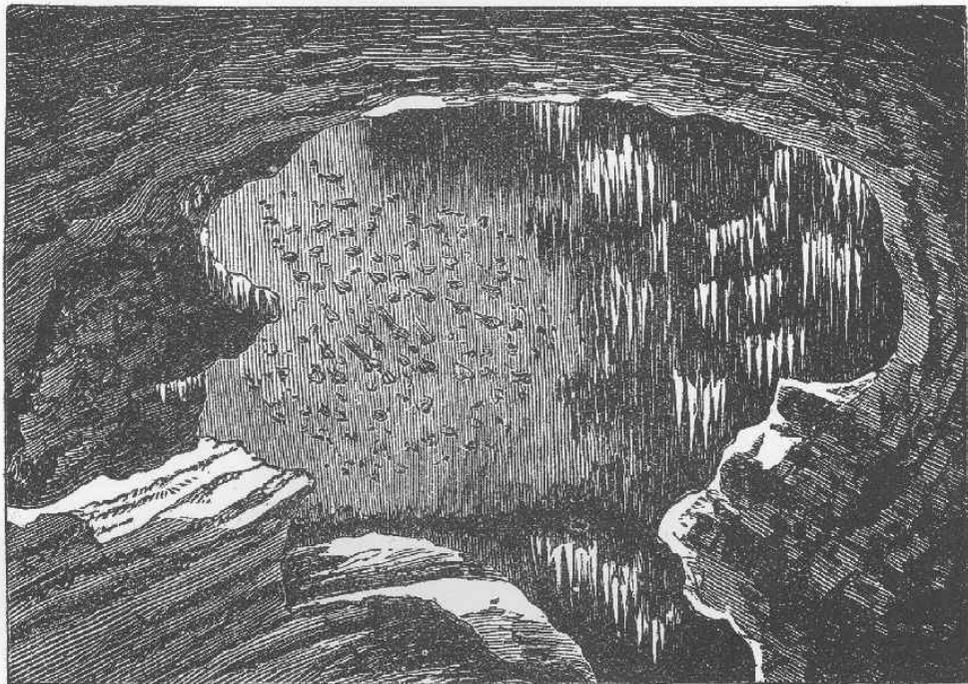
PLATE III.

Interior of Bone Cave, Belubula Caves, Parish of Malongulli, Co. Bathurst.

[Reproduced from an illustration in the *Sydney Town and Country Journal*,
September 9, 1876.]

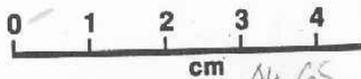
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