BULLETIN OF THE SYDNEY UNIVERSITY SPELEOLOGICAL SOCIETY

Lumen in Tenebris

SUSS

SUSS

FOUNDED 1948

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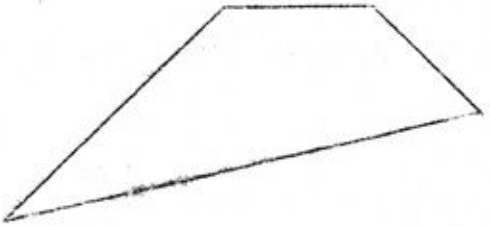
SEPTEMBER MEETING

The September General Meeting will be held in the Badham Room, Old Union, Sydney University
at 7,30pm
on THURSDAY
the 5th September, 1974

PROSPECTIVES !
If there is a cross in the quadrilateral below, your membership expires with this issue. To renew, send $1-50 for 6 months to SUSS.



Price : $2-50 per year

TRIP LIST

SEPTEMBER

5 - 4 GENERAL MEETING

7-8 JENOLAN Glenda Mackay 5701324 or Thea Seabrook
Wyburds Lake Cave

13 SUSS DINNER Sydney University Regiment Hall $5-50 single.
Very little time left to get in your money.

21-22 SEARCH AND RESCUE PRACTICE WEEKEND - BUNGONIA Run by SSS.

28-29 JENOLAN Rik Tunney 042-287410
Exploration in Gant Get Lost section of Mammoth plus possibly a trip in to Great Northern Chamber.

OCTOBER

3 GENERAL MEETING

5-7 JENOLAN Long Weekend Brendon Hyde 4983520
Scaling pole work in Chevallier Cave.

NOVEMBER

7 GENERAL MEETING

DECEMBER

7 SYDNEY NORTHERN BEACHES
Visit StMichaels Cave, Avalon and other sea caves and then an overnight type barbeque at Deep Creek, Narrabeen.

27-29 ASF TENTH CONFERENCE field trips afterwards. See pages 57-58 for details.

It seems that the dreaded exam. lurgy will be striking in November and October. Hopefully there will be a few trips - see the October newsletter.
-Ed.

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Any one wishing to borrow the Dräger Gas Detector - It is now kept at my place.
-Rik.

SUSS Editorial Address-
Rik Tunney. PO Box 176 Fairy Meadow. 2519.

"THREE EXPEDITIONS INTO THE INTERIOR OF EASTERN AUSTRALIA VOL II"
Major T L Mitchell

CONTINUED FROM SUSS 14(5):52

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The pit had been first entered only a short time before I examined it, by Mr. Rankin, to whose assistance in these researches, I am much indebted. He went down, by means of a rope, to one landing place, and then fixing the rope to what seemed a projecting portion of rock, he let himself down to another stage, where he discovered, on the fragment giving way, that the rope had been fastened to a very large bone, and thus these fossils were discovered. The large bone projected from the upper part of the breccia, the only substance which supported, as well as separated, several large blocks, as shewn in the accompanying view of the cave (Pl.45.), and it was covered with a rough tuffaceous encrustation, resembling mortar. No other bone, of so great dimensions, has since been discovered within the breccia. (See Figs. 12 and 13, Pl.51.)

From the second landing place, we descended through a narrow passage between the solid rock on one side, and huge fragments chiefly supported by breccia on the other, the roof being also formed of the latter, and the floor of loose earth and stones. We then reached a small cavern ending in several fissures, choked up with the breccia. One of these crevices (K. Pl.44.) terminated in an oven-shaped opening in the solid rock (Pl. 50.), and was completely filled, in the

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lower part, with soft red earth, which formed also the floor in front of it, and resembled that in the large cavern already described. Osseous breccia filled the upper part of this small recess, and portions of it adhered to the sides and roof adjoining, as if this substance had formerly filled the whole cavity. At about three feet from the floor of this cavity (Pl. 50), the breccia was separated from the loose earth below, by three layers of stalagmitic concretion, each about two inches thick and three apart; and they appeared to be only the remains of layers once of greater extension. as fragments of stalagmite adhered to the sides of the cavity, as shewn in plate 50. The spaces between what remained of these layers, were filled with red ochreous matter, and bones embedded partially in the stalagmite. Those in the lower sides of the layers were most thickly encrusted with tuffaceous matter; those in the upper surfaces, on the contrary, were very white, and free from the red ferruginous ochre, which filled the cavities of those in the breccia, although they contained minute transparent crystals of carbonate of lime.

On digging(at K)into the soft red earth forming the floor of this recess, some fragments of bone, apparently heavier than those in the breccia, were found, and one portion seemed to have been gnawed by a small animal. We obtained also, in this earth, the last phlange of the greatest toe of a kangaroo, and a small water-worn pebble of quartz. By creeping about 15 feet under a mass of solid rock, - which left an opening less than a foot and a half above the floor, we reached a recess about 15 feet high and 12 feet wide (L). The floor consisted of dry red earth, and on digging some feet down, we found fragments of bones - a very large kangaroo tooth (Fig. 6. Pl.47.), a large tooth of an unknown animal (Figs. 4 and 5, Pl.51.), and one resembling some fragments of teeth found in the breccia. (See Figs.6,7,8 and 9, Pl.51.)

We next examined a third cave about 100 yards to the westward of the last described. The entrance, like that of the first, was tolerably easy, but the descent over the lime-

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stone rocks was steeper, and very moist and slimy. Our progress downwards was terminated by water which probably communicated with the river Bell, as its level was much lower when the cave was first visited, during a dry season. I found very pure iron ochre in some of the fissures of this cavern, but not a fragment of bone.

Perceiving that the breccia, where it occurred below, extended to the surface, I directed a pit to be dug on the exterior, about 20 feet from the mouth of the cave, and at a part where no rocks projected. (N, Pl.44.) We found that the hill here consisted of breccia only; which was harder and more compact than that in the cave, and abounded likewise in organic remains.

Finally, I found on the summit of the same hill some weathered blocks of breccia. from which bones protruded, as shewn in the accompanying drawing of a large and remarkable specimen. (Pl.46.)

Other caverns containing breccia of the same describtion, occurr in various parts within a circuit of 50 miles, - and they may probably be found throughout the limestone country not yet examined.

On the north bank of the Macquarie, 8 miles east from the Wellington caves, and at Buree, about 50 miles to the south-east of them, I found this breccia at considerable depths, having been guided to it by certain peculiar appearances of subsidence and disruption, and by yawning holes in the surface, which previous experience had taught me to consider as indications of its existence.

On entering one of these fissures, from the bed of the little stream near Buree, and following, to a considerable distance, the subterraneous channel of the rivulet, we found a red breccia containing bones as abundantly as that of Wellington Valley. It occurred also amidst masses of broken rocks, between which we climbed until we saw daylight above; and being fina drawn out with ropes, we emerged near the top of a hill, from a hole very similar, in

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appearance, to the mouth of the cave at Wellington - which it also resembled, in having breccia both in the sides of the orifice, and in the surface around it.

At Molong, 36 miles east of Wellington Valley, I found some concreted matter within a small cavity of limestone rock on the surface, and when broken, this proved to be also breccia containing fragments of bone.

(Major Mitchell continues his account with a letter from Professor Owen at the Hunterian Museum dated May 8th, 1838 in which several bone specimens are identified. These include specimens of several new apecies of Macropus and a new Genus "Diprotodon". Major Mitchell concludes the chapter with a discussion on the recent geological history of eastern Australia. -Ed.)

LIMESTONE IN THE JENOLAN CAVES AREA

LEONIE CHALKER

(Reprinted from 'Records of the Geological Survey of N.S.W Vol 13 No 2.)

ABSTRACT

The rocks in the Jenolan Caves area comprise early Palaeozoic sediments and volcanics intruded by a few small igneous bodies. In the west the sediments are thought to be Silurian in age from lithological similarities with sediments of Silurian age elsewhere on the Capertee Geanticline. These are overlain by the Upper Silurian Jenolan Caves Limestone, a quite pure, fossiliferous limestone containing the reworked remains of stromatoporoids, corals, brachiopods, gastropods, nautiloids and algae. The limestone is overlain by a sequence of sediments and volcanics which probably ranges up into the Lower Devonian. Muddy limestone lenses interbedded with shale are found about a mile to the east of Jenolan Caves and occupy a similar stratigraphic position to the Jenolan Caves Limestone, forming part of the eastern limb of a syncline. Fossil identifications by J. Byrnes and J.W. Pickett are included.

INTRODUCTION

Mapping of the limestone in the vicinity of Jenolan Caves was carried out in May 1969 by the author and Miss Carol Mitchell as part of a survey of limestone resources of New South Wales. The area lies in County Westmoreland, Parish Jenolan, 70 road miles west of Sydney. Access is by sealed road from Sydney through Katoomba, Blackheath and Hartley to Jenolan Caves. The area is steep and heavily timbered with relief of up to 2000 feet, the elevation ranging from 2000 feet to 4000 feet above sea level. The steep, youthful vallies drain mainly to the east, the largest streams being the Jenolan River (known locally as McKeowns Creek or McKeowns Valley north from Jenolan Caves) and Camp Creek.

Vegetation changes between limestone and other rocks are very marked, the Cave Limestone being predominantly grass covered with scattered trees, wheras the surroundung shale, chert, rhyolite and tuff are heavily wooded, with little grass cover.

GEOLOGY

General

The rocks in the Jenolan Caves area comprise early Palaeozoic sediments and volcanics intruded by a few small igneous bodies.

In the west the sediments consist of chert, clay shale and argillite intruded by andesite, and are thought to be Silurian in age because of lithilogical similarity to sediments of Silurian age elsewhere on the Capertee Geanticline. Towards the east this sequence is overlain, possibly unconformably, by the Upper Silurian Jenolan Caves Limestone. During this period the area formed part of the Capertee Geanticline on which the Jenolan Caves Limestone was deposited in a very shallow-water environment. Muddy lensoidal limestones thought to be equivalent to the Cave Limestone crop out about a mile to the east of the Cave Limestone. A sequence of slate, rhyolite, siltstone, claystone and porphyry lies between the Jenolan Caves Limestone and the eastern limestone lenses.

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Previous workers have postulated varied structural interpretations for the area. Süssmilch and Stone (1915) proposed a symmetrical anticlinal structure, while Stanley (1925) preferred a strike faulted anticline. Chand (1963) and Gulson (1963) also considered the structure to be basically anticlinal but Pratt (1965) proposed a synclinal structure. The present author's work supports Pratt's synclinal interpretation and therefore would support the suggestion made on lithological grounds by Chand (1963) and Gulson (1963) that the sequence between the Jenolan Caves Limestone and the eastern limestone lenses ranges up into the Lower Devonian.

Small stock-like granitic bodies intrude the sediments at a number of localities.

Jenolan Caves Limestone

This limestone was very briefly mentioned in 1896 by David who called it the "Jenolan Caves Limestone". Süssmilch and Stone (1915) were the first to give a detailed description and they named it the "Caves Limestone". The latter name was used by all workers until Pratt in 1965 proposed the re-introduction of "Jenolan Caves Limestone" in his unpublished B.Sc. (Hons) thesis.

The Jenolan Caves Limestone is a massive well-jointed belt of almost pure calcium carbonate (analyses have given 96% - 99% $CaCO_3$). The colour is a fairly uniform grey, though some white limestone can be found. At some localities in the southern part of the limestone belt, the rock weathers deep red.

Analysis of Limestone from a locality
1 mile south of Jenolan Caves
(Geological and Mining Museum Sample No. 5183)

Calcium carbonate	96.5%
Magnesium Carbonate	2.1%
Gangue	0.6%
Acid soluble ferric oxide + alumina, etc	0.3%
Acid soluble iron as ferric oxide	0.14%
Moisture and undetermined	0.5%

The belt runs almost north-south from just north of the Kanangra Walls road to Jenolan Caves where the strike swings to approximately 330°M. Outcrop is continuous for 3 miles north from the southern end, but 1½ miles north of Jenolan Caves along the Jenolan River (McKeowns Valley) this massive limestone becomes lenticular, the northernmost lens being 2½ miles north of Jenolan Caves.

Shale lenses up to 200 yards long and 20 feet thick are interbedded with the limestone on its western margin. In general, bedding is not visible in the limestone except where it is interbedded with shale, though joint planes are common and could in some instances be mistaken for bedding.

Previous workers in the area have stated that the dip of this limestone is 60° - 65° to the west as indicated by interbedded shale lenses. While this is undoubtedly correct at some localities -- particularly near Caves House -- a number of vertical dips were recorded in the southern part of the belt.

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In the limestone found in McKeowns Valley, some recrystallization has occurred and the small rhombs of calcite have been coated with iron oxide so that parts of the rock are pinkish red in colour. The amount of coating varies considerably and occurs in small, thin, parallel bands less than 1cm wide up to bands 10cm wide with perpendicular bands of coated material connecting these to give a brick-like appearance. In those places where recrystallization has occurred it can be noted in thin section that the fossils have not generally been affected (J.Byrnes, pers. comm., 1970).

The limestone is fossiliferous, stromatoporoids and corals being the most abundant. They are particularly common in McKeowns Valley, about a mile north of Jenolan Caves. Recent work by J.Byrnes of the University of Sydney has added considerably to the number of species identified. Byrnes considers that the limestone probably represents reworked detritus shed from small reefs and deposited on a shallow shelf. The presence of mud cracks suggests some intertidal conditions at times. A list of fossils identified by Byrnes is included in this report together with identifications by J.W. Pickett of the Geological and Mining Museum. These indicate Upper Silurian age for the Jenolan Caves Limestone.

In the present work no evidence was found for the thrust fault along the western boundary of the limestone proposed by Süssmilch and Stone (1915) to explain their anticlinal hypothesis, although a small fault was found near Caves House. Byrnes (pers. comm., 1970) reported the presence of stromatoporoids on the western margin of the limestone which seem to be encrusting the adjacent rocks. This indicates that the Jenolan Caves Limestone lies on the partly overturned western limb of a syncline, the sequence immediately to the east being younger in age.

Eastern Limestone Lenses

The limestone which crops out from three-quaters of a mile to 1¼ miles east of Caves House has previously been loosely termed the Eastern Limestone Belt. The term is misleading as the present mapping has shown that the limestone occurs as isolated lenses interbedded with shale. The colour varies from white, cream, pink, and grey to black. Lithologically, the limestone is quite different from the western Jenolan Caves Limestone belt. Wheras the Jenolan Caves Limestone consists of at least 96 per cent calcium carbonate, the eastern limestone lenses contain a significant amount of shaly material and are extensively recrystallized. The eastern limestone lenses are much less fossiliferous than the Jenolan Caves Limestone. Gulson (1963) recorded crinoid stems and a stromatoporoid. The lack of fossils could be due to recrystallization or to the environment of deposition.

The dip of the beds in the eastern limestone is extremely variable from steeply dipping westerly through shallow dips to moderate easterly dips. Small - scale folding and faulting are apparent at many localities.

It is thought that these lenses lie in a similar stratigraphic position to the Jenolan Caves Limestone. They probably represent a deeper water environment than that of the Jenolan Caves Limestone.

FOSSILS

The following list of fossils was supplied by John Byrnes. The

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assemblage indicates an Upper Silurian age, as does that supplied by J.W. Pickett.

Corals

Coenites pinaxoides Etheridge
Favosites gothlandicus
F. yassensis
F. allani
F. richardsi
Branching Favosites
Heliolites regularis Dun var. humewoodensis Dun
Heliolites yassensis Dun
Phaulactis shearsbyi
Propora shearsbyi
Pycnostylus sp. (probably Tryplasma lonsdalei sclariforme Etheridge in earlier faunal lists).

Stromatoporoids

Amphipora
Clathrodictyon spp.
Parastriatopora sp.
Stromatopora sp.

Algae

Dasyporella
Girvanella
Solenopora

Brachiopods

Conchidium biloculoris
Atrypid brachiopods

Also gastropods and straight nautiloids

The following identifications were supplied by Dr J.W.Pickett in two separate reports (1969, 1970).

Collected by Leonie Chalker

Locality 1. (Jenolan 1:31,680 sheet (8930 III), G.R. 013219.)
Actinostroma sp. aff. stellulata Nicholson
Stromatopora sp.
Stachyodes sp.
? Paramphipora sp.
Clathrodictyon sp.
Phaulactis sp. nov.
Tryplasma sp.
Favosites sp.
Heliolites sp.
Striatopora sp.

Collected by Carol Mitchell.

Locality 2. (G.R. 013219)
Stromatopora sp.

Locality 3. (G.R. 006227)
Kirkidium sp.

Locality 4. (G.R. 011206)
Favosites sp.
Also Heliolites daintreei Nicholson and Etheridge
and Encrinurus sp.

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ACKNOWLEDGEMENTS

The guidance of Miss Carol Mitchell during field work and the information which she provided is greatly appreciated. Acknowledgement is also due to the guides at Jenolan Caves for their assistance.

BIBLIOGRAPHY

Chand, F., 1963 The geology of the area northeast of Jenolan River. B.Sc. Hons. Thesis, Univ. N.S.W., (unpubl.).

David, T. W. E., 1896 The occurrence of radiolaria in Palaeozoic rocks in New South Wales. Proc. Linn. Soc. N.S.W., 21(4); 553-570

Gulson, B. L., 1963 Geology of the area southeast of Jenolan Caves, New South Wales. B.Sc. Hons. Thesis, Univ. N.S.W., (unpubl).

Pickett, J. W. 1969 Fossils from the Jenolan Caves Limestone. Palaeont. Rep. geol. Surv. N.S.W., 1969/6

Pickett, J. W. 1970 Fossils from the Jenolan Area. Palaeont. Rep. geol. Surv. N.S.W., 1970/6

Pratt, B. T. 1965 Geology of the area between Jenolan Caves and Ginkin, New South Wales. B.Sc. Hons. Thesis, Univ. N.S.W. (unpubl).

Stanley, G. A. V., 1925 A preliminary account of the geology and petrology of the Jenolan Caves Reserve. B.SC. Hons. Thesis, Univ. Sydney (unpubl).

Süssmilch, C. A., 1912 Note on the geology of Jenolan. Rep. 13th Meeting Australas. Assoc. Advmt. Sci., 1911, 120

Süssmilch, C. A. and Stone, W. G., 1915 Geology of the Jenolan Caves district. J. Proc. R. Soc. N.S.W., 49, 332-384.

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A. S. F. SEARCH AND RESCUE WEEK = END

This week-end is to be run by SSS and will be held at Bungonia.

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List of members continued from page 60

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Frazer, Ian	22 Cook Tce Mona Vale 2103	992059
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If there are any errors in this list please contact the society.

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