

CLIEFDEN CAVES.

This article was first published in the 'Newcaves Chronicles' No.42, pp. 34-44, the official publication of the 'Newcastle and Hunter Valley Speleological Society Inc'. The article (in full or part) may be reproduced in other speleological publications, provided there is full acknowledgement of authorship and original publication. Other publications must seek permission to reproduce this article © Garry K. Smith. [gksmith29@icloud.com]

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LOCATION

Cliefden karst area is located 22 km by road west of Mandurama or 30 km west of Carcoar.

The nearest sizeable town is Blayney some 43 km by road to the east. All the caves are on private properties in the heart of Scotch Thistle (*Onopordum acanthium*) country, which can make access difficult during the summer months. Access is restricted to members of groups affiliated with the ASF and the property owners request that all visitors must have a permit issued through the Orange Speleological society (OSS).

DESCRIPTION

The caves are located along the Belubula River and its southern tributary, Limestone Creek. The Belubula River gets its name from the aboriginal word meaning "twisting snake", an appropriate name as the river twists and turns through steep sided knolls of limestone. The Australian Karst Index has included the caves along Limestone Creek near the "Wyoming" property as part of this karst area.

The larger caves in this system have been gated and locked. Access is restricted to recognised speleological groups to ensure the protection of these unique caves.

There are in excess of 60 caves and over 50 additional karst features at Cliefden. Some of the larger caves are: Main Cave (CL1), Murder (CL2), Boonderoo (CL3), Trapdoor (CL4), Taplow Maze (CL5), Island (CL6), Transmission (CL8) and Malongulli (CL69). Most of these caves are well decorated and contain speleothems ranging in colour from clear through pure white, yellow orange and several rare formations of sky blue and aqua green.

Transmission Cave (CL8) is sometimes used by Horseshoe bats (*Rhinolophus megaphyllus*) as a maternity cave during the spring and Gable Cave (CL7) is used by the Bentwing bats (*Miniopterus schreibersii oceanensis*) as an over wintering roost (D. Marsh, *Pers. Comm.*).

Taplow Maze (CL5) contains only a small amount of poor quality decoration in the total passage length of 3004 m, consisting of complex joint-controlled networks at two levels. This cave has been used for search and rescue training as getting lost is a real hazard. However dust stirred up from the floor by movement, can also be a problem.

Also of interest is the warm spring which discharges water from the Western bank of the Belubula River. It is located adjacent the southern 'Kalimna' boundary fence, however in recent times has become overgrown with blackberry vine. Tell tale signs of its location can be seen on cold winter mornings when steam rises from the warm water.

Preliminary surveys of the cave invertebrates (Eberhard and Spate, 1995), found the caves provide habitat for over 20 species of invertebrates, including an endemic species of troglobite and stygobite (Thurgate et al., 2001).

HISTORY

It should be specially noted that in many early historical reports the Cliefden Caves are referred to as the Belubula Caves. In more recent times the Central Mapping Authority of N.S.W, show the Belubula Caves in an outcrop some 7 km to the southwest of Cliefden Caves. For the purpose of this publication the Belubula Caves are included in the Walli Caves limestone outcrop as they are within 1.5 km of each other in the same belt of Ordovician limestone.

Surveyor Evans in 1815 made the first recorded discovery of limestone in N.S.W along Limestone

Creek near Cliefden (Evans, 1815). Surveyor, John Oxley in 1817, set out from Bathurst on an expedition to solve 'The Mystery of the Western Rivers'. On the first leg of his exploration he travelled down the Belubula River and camped in the vicinity of Cliefden downstream from Limestone Creek. He reports that on 23 April 1817, "limestone abounds in the valley where we halted; the sides and abrupt projections of the hills being composed entirely of it, and worn by the operation of time into a thousand whimsical shapes and forms". His diary entry for the following day states, "A small piece of limestone which had been put in the fire last night was found perfectly calcined into the purest white lime." (Oxley, 1820).

William Rothery arrived in the colony in 1830 and travelled to Cliefden in January 1831 where he squatted in anticipation of acquiring the land (Murray, *My Pioneers and Their Lives*).

In 1832 brothers William M. and Frederick J. Rothery were each granted 2460 acres parcels of adjoining land, which comprised much of the Cliefden karst area. In the years after their initial land grant, the brothers continued to acquire large portions of additional land. William called his "Cliefden" and Frederick called his property "Cliefden Springs". It is believed that the Rotherys were encouraged by King George III to name their properties after the Prince of Wales' residence 'Cliefden' (Powell, 1983; Register of the National Estate - Place ID. 14036; Thompson, 1997).

William Rothery started with 45 sheep he had brought out from England and later expanded to include cattle. Only part of a crumbling wall remains of the original homestead near Wyoming (near Molongulli Cave). In 1832 he moved up to the present Cliefden homestead site. Between 1837 and 1840 he extended the homestead to that of its present size. William Rothery was the first in Australia to send wool directly back to England. William Rothery and his wife Fanny had 12 children, three of whom died before or around the age of one. (Colston and Wenck Genealogy Pages)

On September 26, 1863 the Ben Hall gang raided Cliefden dressed in stolen police uniforms. Caught by surprise, Mr Rothery was tied to a chair while the gang enjoyed lunch prepared by his Chinese cook. Luckily the cook had second thoughts about poisoning the food because Rothery was made to taste the meal first. One of the sons, Albert then 22 years old at the time had hid some hundreds of pounds in notes in the foot of a Wellington boot, before throwing the boot on the floor. The bushrangers actually kicked it, but did not disturb the treasure. The gang then escaped on three of Rothery's best horses (Powell, 1983; Rothery, 1924).

In 1877, James Crawford (noted scientist, explorer etc) and Dr. Hector (Director-General of the Geological Surveyor of New Zealand) travelled by train over the Blue Mountains to Blayney. From there they caught the mail-coach to Cliefden where they stayed several days with Mr. Rothery. In his book 'Recollections of Travel in New Zealand and Australia', Crawford describes seeing large outcrops of limestone and (Ed. incorrectly identified) Devonian fossils. Crawford says, "The banks of the Belubula are very pretty, with river oaks growing on them, and here we saw a strong hot spring." No doubt the Cliefden thermal spring later described by others. Crawford and Hector, also rode horses to the old Belubula copper mine (Crawford, 1880).

Fossil Hill, already well known for its fossils, was visited by surveyor, Oliver Trickett and Mr J.C. Wiburd (Caretaker at Jenolan) in 1908. Trickett went on to sketch and describe it in his report for the "Annual Report of the Department of Mines". They visited several caves and described how many of the formations had been soiled by visitors hands after coming in contact with the clayey floors. Also mentioned in the 1908 report, is the warm spring which he describes as discharging 10,000 gallons of water per hour at a temperature of 84°F (28.9°C) (Trickett, 1908).

In 1919 the Dunhill Family purchased around 1600 acres in the centre of the limestone outcrop. Subsequent purchases by the three generations of Dunhill's has increased the property to approximately 3500 acres, which encompass almost all of the major caves within the present property boundaries.

In 1924 Dr Charles Anderson and Mr. A. Musgrave, an entomologist visited the Cliefden Caves to study cave fauna. They were guided through the Main Cave by Misses Judy and Eileen Hosie, residents of the nearby Carlton Station. With the aid of candles they explored the main chamber and

Mr Musgrave photographed many formations including, "Lot's Wife", which is a huge stalagmite in the centre of the chamber. Next day they crossed the river and by the description descended Trap Door (CL4) then crossed back over the river to explore Shepherds Cave (CL11). In another cave known as the "Bat Cave", most likely Transmission Cave, they discovered a new species of beetle. Dr Anderson's article published in the Australian Museum Magazine, suggests that much of the credit for the caves exploration should go to members of the Hosie family. He believes the caves were discovered by a Mr Rittameister many years ago. While kangaroo hunting on a winters morning he observed steam rising from a huge cleft in the limestone. Later he returned with some companions and explored the caves (Anderson, 1924).

Shepherds Cave (CL11) is thought to have gained its name from an event which is believed to have happened around the 1870's. The story goes that two shepherds worked on the property before the time of fences to restrain the sheep from wandering. One shepherd persisted in frequently counting his money (£1 in silver coins) in front of the other who had none. An argument developed which resulted in the murder of the wealthy shepherd. His body was apparently cut in halves and dumped into the entrance of the cave now known as Murder Cave (CL2) (Anderson, 1924).

In 1931, L. F Harper - Senior Geological Surveyor undertook an examination of suggested dam sites on the Belubula River at the needles. His report to the Water Conservation and Irrigation Commission concludes with, "Reviewing all the geological conditions observed, I am of the opinion that the existing structures and variation in rock type are not favourable for the erection of a major dam." (Harper, 1931).

During August 1932, three staff from the Australian Museum (Sydney) removed a large quantity of formations (over 1000 specimens) from the lower level of Cliefden Main Cave, (with the permission of the property owner at that time). The formations were used to make the museum's model of a cave more realistic. When the stalactites, shawls, helictites and other formations were placed in position, it was found that there was insufficient material to produce the required effect.

In April 1934, nearly two years after the first expedition the museum staff returned to collect a further 1000 specimens. The exhibit was to be located in a somewhat dark space measuring 9 ft x 10 ft x 10 ft (2.7 x 3 x 3 m), under the stairway at the entrance to the mineral gallery. This presented considerable difficulties in displaying all features of a cave in such a confined space. Hodge-Smith describes how Museum staff strategically placed mirrors so that the observer could look up through a chimney into a cave on a higher level to see formations which appeared to be 5 metres above. In fact the visitors were looking at a concealed cave built upside-down. An underground river was also displayed, and the illusion of looking some 9 metres along the river was achieved with the use of almost parallel mirrors. Even fine detail down to water drops were not overlooked. The Crown Crystal Glass Company went to considerable trouble to manufacture glass water droplets, which were attached to some stalactites (Hodge-Smith, 1936). The cave exhibit took three and a half years to construct and remained on display up till 1985. It was disbanded during renovation work, but a new exhibit was reconstructed in 1986 using many of the original formations as well as additional plaster and resin components.

It is believed that during the period 1934-36 a large portion of a sky blue stalactite was removed from the Boonderoo Cave (CL-3). Mysteriously the formation reappeared on display many years later in the Sydney Museum.

At a request of the Water Conservation and Irrigation Commission the Government geologist E.J Kenny completed a report in 1941, with a follow up report by L.F. Harper in 1946, assessing possible dam sites on the Belubula River. One site was studied at The Needles and five downstream at Cranky Rock. Of the six sites, four were totally ruled out as unsuitable due to the geological structure of the sites and the remaining two sites at Cranky Rock were considered dubious with a number of constraints (Kenny, 1941; Harper, 1946).

In 1950, Stevens recognised Ordovician fossils within and above the outcrop. This dispelled the long held belief that the outcrop was of Silurian age. Stevens observation was the first recording of Ordovician limestone in New South Wales (Stevens 1950; 1952).

By the early 1960's speleological clubs were frequently visiting the Cliefden and nearby Walli Caves. 'Orange Speleological Society' (OSS) and the 'Sydney Speleological Society' (SSS) held numerous joint trips to explore the known caves and search for new ones. Members of 'Sydney University Speleological Society' (SUSS) and the 'University of NSW Speleological Society' (UNSWSS), were regular visitors to the area during the 1960's and 70's and undertook a considerable amount of cave surveying.

In 1970 the Kriesler Caving Club completed the mapping of the Main Cave (CL1) which was called the Big Cliefden Cave at that time. They had started the surveying in 1964 according to an SSS trip report of the time.

In April 1974 UNSWSS mapped the Noonameena Cave (CL64).

In January 1975 the caves came under threat of being permanently flooded when the N.S.W. Planning and Environment Commission identified the need for water by the year 2006, in the expanding population growth areas of Bathurst and Orange. In the short term it was proposed to draw water from the Ben Chifley Dam, while for the long term more dams would be needed. The first option mentioned several possible dam sites which would not affect the caves. However the second option involved the construction of a major dam on the Belubula River at Oak Pride or the Needles. To complicate matters the Carcoar Dam located upstream from the caves had been completed around the end of 1970 for the regulation of stream flow and irrigating land below the dam. Prior to the construction of this dam two sites were considered downstream from Cliefden. Water levels investigated at the time for the Needles Gap and Cranky Rock sites would flood Cliefden caves. The caving fraternity became aware of the threat in June 1975 when an ASF secretarial circular was widely distributed. A mini conference was organised for 8th-9th November 1975 at Cliefden to familiarise as many people as possible with the area. This weekend was well attended by representatives from six speleo groups with a view to saving the caves if they came under serious threat.

On November 4th, 1977, Members of BMSC began the mammoth job of surveying the Taplow Maze (CL5). A task finally completed on December 4th, 1983 after taking in excess of 1000 man hours. The cavers guide to Taplow Cave was published by BMSC in 1985 (Coleborn and Coleborn 1985)

Until well into the 1980's the Cliefden homestead and property now reduced to 500 ha (after portions had been sold off) was still run by the five surviving granddaughters of W.M. Rothery. The daughters do recall visiting the Main Caves during their childhood with only a flickering candle. Rose Rothery vividly recalls one such day, "when the candle went out we got out" (Hall, 1982).

During Easter 1985, the skeleton of an aboriginal male was found in CL93 by members of NSWSS, which resulted in an inspection by police and officers of the NSW NPWS. The bones were dated at 6250 ± 430 years before present and it is thought that the individual fell into the cave (i.e. was not buried) (Pardoe and Webb, 1986). This was one of the most detailed analysis of skeletal material from a cave in south eastern Australia (Spate, 1993).

Over many years the OSS has maintained a close working relationship with the property owner (Dunhill family) and has regulated access to the caves in accordance with the owner's request. In recent years, OSS members have carried out substantial renovation work on the Cliefden Hut, which is used by cavers as accommodation while on the property and shearers during the wool clipping season.

On the 11/08/1987 Cliefden Caves, Fossil Hill and Trilobite Hill, were listed on the Register of National Estate, which stated: "The area is the type locality for thirty two new species of fossil corals, stromatoporoids, trilobites, brachiopods, bryozoa, echinoderms and graptolites, and is an outstanding research and educational area." The Estate register closed in 2007, and the listing was not transferred to the government's National Heritage List. As such the caves are not protected under national or state environment law.

In 1997 the ASF applied for a grant through the 'NSW Environmental Trust's, Environmental Restoration and Rehabilitation Trust', in order to facilitate Cliefden Caves Vegetation

Rehabilitation and Conservation Project. The \$5000 grant was received in 1998 and provided funds for the erection of fences around the limestone outcrop known as 'The Island' to exclude stock and to plant over 1000 native trees and scrubs on the karst area. Most of this work was completed between late 1998 through to early 1999, by volunteers from OSS and other NSW Speleo Council clubs in cooperation with the property owner. In addition to the grant, the property owner (Anthony Dunhill) supplied fence posts worth in excess of \$7000 and much valued assistance and support during the project (Dunne, et al., 2002)

In December 2006, members of OSS began the mammoth task of cleaning up the 'Rubbish Pit' doline on the 'Boonderoo' property. During the 6 weekends of working bees, there were many trips to the recyclers with over a tonne of glass and crushed cans, several tonnes of scrap metal and a number of truck loads of general rubbish taken to Blayney tip. The entrance to Rubbish Pit cave (CL95) was eventually uncovered on 2nd September 2007 and the cave entered on a later trip. Broken bricks and concrete were removed from the doline during a working bee in August 2008. There were further working bees to remove rubbish from within the cave between 2010-13 (Curtis, 2013).

In 2009, OSS began promoting through trips of Main Cave with exiting at the lower entrance, to reduce transport of mud back to the upper chambers.

In July 2012, the proposition of a dam at The Needles was again raised at a Local Government Water Conference when an officer of State Water NSW, in his address to the conference, stated that State Water had identified three locations in NSW that were suitable for new water storages. One of which was on the Belubula River at the location called The Needles. The NSW Department of Infrastructure released a report on 3rd October 2012 titled "State infrastructure Strategy 2012-2032" which recommended a "New Carcoar dam in the Lachlan Catchment". Then in August 2013, Central Tablelands Water (CTW) called on the Federal and State politicians to back this new dam. The Federal member for Calare, John Cobb in a press release on 21st January 2014, announced the proposal for the construction of a 90,000ML dam at Needles Gap and called on State and Federal Governments to back the plan. Mr Cobb followed this up the same day, with an onsite meeting of local town Mayors, GM's of local water authorities and media at the Needles Gap site overlooking the Belubula River. On 17th June 2014 the NSW Minister for Natural Resources, Land and Water, Kevin Humphries announced that \$1 million had been allocated in the NSW 2014 budget for a scoping study into the Needles Gap Dam. On 12th July 2014 Mr Humphries further announced that the NSW government would also add another \$3.5 million to facilitate a full feasibility study over the next 2 years.

The proposed dam at the Needles and several of the Cranky Rock sites would flood many of the Cliefden caves and partially submerge the fossil beds. By July 2014, growing opposition to the dam proposal amongst the Speleological community saw the formation of the 'Save Cliefden Caves' committee and a web site developed. The inaugural meeting held at Bankstown, was attended by 27 representatives from twelve NSW caving clubs and several likeminded societies.

GEOLOGY

The Ordovician Limestone of the Cliefden Caves Limestone Subgroup (Geoscience Australia, 2014) outcrops along the Belubula River, near the junction of Limestone Creek, and is the oldest and best exposed extensive body of limestone in NSW (Webby and Packham, 1982). The body is estimated to be some 250 m thick and comprised of regularly stratified beds ranging from 1 to 30 m thick with occasional beds of shale. Analysed limestone samples have yielded results of between 97.7% and 99% CaCO₃ (Lishmund, et al., 1986).

The Licking Hole Creek limestone deposit in which Walli Caves occur, lies some 3 km to the southwest and is regarded as a continuation of the Cliefden limestone. In a broader view, the Cargo - Canowindra - Walli and Cliefden areas are considered as the one limestone unit which constitutes one of the state's largest deposit of limestone (Lishmund, et al., 1986).

Several caves within this karst area contain speleothems, which are tinted blue. Analysis of the speleothems indicate that the sky blue and aqua blue colour is due to the presence of copper,

chrome and nickel, which has leached through the limestone and has been deposited in conjunction with the calcite (Turner, 2002). Fibrous gypsum in clay is also present in a number of caves.

Many examples of tufa can be seen high up on the hillside along Davys Creek near Fossil Hill, and are among the most extensive in NSW. The deposits occur up to 14 m above the current stream channel and provide insight to the formation of the local landscape. This indicates that the creek water has been actively depositing limestone in the creek bed for many thousands of years while eroding the valley to its present position (Cathew and Drysdale, 2003).

The Cliefden Caves Limestone Group contains one of the most complete and well preserved records of Ordovician island organisms known. These provide a unique 'window' into an otherwise patchy and incomplete fossil record (Webby, 1992). The Fossil Hill Limestone member contains the world's earliest known in situ shell beds (Webby and Percival, 1983; Percival, 1985).

One kilometre to the northeast of Fossil Hill is an abandoned Baryte Mine where the mineral Barium Sulphate (BaSO_4) was mined between 1960-65. Analyses of an ironstained barite sample revealed a content of between 81.2% to 92.3% barium sulphate and less than 0.01% to 0.35% iron in the form Fe_2O_3 . Other impurities included pyrite, chalcopyrite and a little galena. "In places a quite heavy copper-staining (malachite and some azurite) is present, but CuO content does not exceed 0.01%." The vein ranged in thickness from 5ft to 1/8" and proved to be uneconomical at £5 per ton (Gibbons, 1963; Wallis, 1965).

A thermal spring located on the Belubula River downstream of the caves, is only one of three known thermal springs associated with karst in NSW (the other examples occur at Wee Jasper and Yarrangobilly). It was first recorded by Wilkinson in 1892, and an analysis of the water appears in Oliver Trickett's report of 1908 (Wilkinson, 1892; Trickett, 1908).

Despite the caves being close to the Belubula River there are no telltale signs to suggest that the caves were created by surface water flowing into or through them. Evidence suggests that they are hypogene caves (formed by rising ground water). A permanent thermal spring is situated immediately downstream of the limestone outcropping and may have played a part in this process (Osborne, 2001; 2009)

There have been many papers written about the importance of Fossil Hill and the surrounding limestone karst area, which contain a diverse range of fossils. More than 180 species, include the earliest rugose corals have been recorded in the Cliefden Caves Limestone Group and Malongulli Formation. The well exposed site shows the progression from nearshore to deep water marine environments. "The Cliefden Caves- Belubula River Valley sites, contains the best exposures of Late Ordovician island marine invertebrate fossils assemblages in Australia." "The site contains well documented faunas including brachiopods, corals, stromatoporoids, sponges, trilobites and conodonts." "The well documented faunas and biostratigraphy serve as the reference sections of the Late Ordovician in Australia and a window to Late Ordovician island arc biota." (Australian Fossil Heritage, 2012).

The caves are all located on private properties and at the insistence of the owners, caving permits are administered under strict control of Orange Speleological Society (OSS). For further details contact the OSS.

REFERENCES

- Anderson, Dr C., (1924). A Visit to the Belubula Caves, "*The Australian Museum Magazine*" Vol. 2, No. 1. P. 12-17. January 1924. Published by the Australian Museum, College St, Sydney.
- "Australian Fossil Heritage, A Catalogue of Important Australian Fossil Sites", (2012). The Australian Heritage Council. Published by Commonwealth Scientific and Industrial Research Organisation (CSIRO) Publishing. 150 Oxford St. (PO Box 1139) Collingwood, VIC 3066, Australia. ISBN 9780643102309.
- Carthew, K. D. and Drysdale, R. N. (2003). Late Holocene fluvial change in a tufa-depositing stream: Davys Creek, New South Wales, Australia, *Australian Geographer* 34, 123-139.

- Coleborn, T & Coleborn, L., (1985). Statistics of Taplow Maze (CL5), Cliefden Caves "OOLITE" V. 15, No. 3, P. 41-43.
- Colston and Wenck Genealogy Pages. William Montagu Rothery Abt 1810-1899, Cliefden. Web page, <http://colston-wenck.com/getperson.php?personID=I1324&tree=colstonwenck>
- Crawford, J. C., (1880). "*Recollections of Travel in New Zealand and Australia*", published by Trüebner & Co., Ludgate Hill, London. P. 304.
- Curtis, I., (2013), Rubbish Pit Cave Doline Rehabilitation Project. Published in "Descent", Journal of the Orange Speleological Society (OSS), V. 13, February 2013, P.7-12.
- Dunne, C., et al (2002). "Cliefden Caves Vegetation Rehabilitation and Conservation Project", 1998-1999 - Final Report (June 2002). Prepared for the NSW Government - Environmental Trust by the Australian Speleological Federation. P.O. Box 388, Broadway NSW 2007.
- Eberhard, S. and Spate, A. (1995). Cave invertebrate survey: Toward an atlas of NSW Cave Fauna. *Report to the Department of Urban Affairs and Planning and the Australian Heritage Commission, Canberra.*
- Evans, G.W., (1815). Evans's second journal: Discovery of the Lachlan River (Enclosure of Dispatch 9/1815). Published in *Two Journals of early Exploration in New South Wales*. Sourced from Commonwealth of Australia. Historical Records of Australia. Series I. Governors' dispatches to and from England. Volume VIII. July, 1813 – December, 1815. Published by: The Library Committee of the Commonwealth Parliament 1916. Sydney: William Applegate Gullick, Government Printers 1916.
- Geoscience Australia (2014) Australian Stratigraphic Units Database http://dbforms.ga.gov.au/www/geodx.strat_units.int
- Gibbons, G. S., and Pogson, D.J., (1963). Cliefden Springs Barite Deposit. "*Dept. of Mines Geological Survey. N.S.W.*", Report. No.28. Printed (1965).
- Hall, T., (1982). Article about history of Cliefden property: Secret Caves and Bushrangers Part of a Pioneer Family's Past. "*The Australian Women's Weekly*", June 2, 1982. P. 29.
- Harper, L. F., (1931), Examination of Suggested Dam Sites on the Belubula River. "*Geological Survey Report (GS1941/057)*". Report undertaken for the 'Water Conservation and Irrigation Commission', Dated 29-10-1931.
- Hodge-Smith, T., (1936). Limestone Caves in the Museum, "*The Australian Museum Magazine*" Vol. VI, No. 2. April-June, 1936. Published by the Australian Museum, College St, Sydney.
- Kenny, E. J, (1941) & Harper, L. J, (1946). Dam Sites on the Belubula River, Near Canowindra. "*Geological Survey Report (GS1941/057)*". Report undertaken for the 'Water Conservation and Irrigation Commission'.
- Lishmund, S.R., Dawood, A.D., Langley, W.V., (1986). Geological Survey Of New South Wales, Mineral Resources 25, 2nd edition Dept. of Mineral Resources. "*The Limestone Deposits of NSW*", ISSN 0077-8737.
- Murray F., My Early Pioneers and Their Lives, on the web at <http://www.frankmurray.com.au>, "Births, Marriages and Deaths from Thomas O'Shaughnessy's Diary. Part 5. 1898 -1903".
- Osborne, R.A.L., 2001. Halls and narrows: Network caves in dipping limestone, examples from eastern Australia *Cave and karst science* 28(1): 3-14.
- Osborne, R.A.L., 2009. Hypogene caves in deformed (fold belt) strata: observations from eastern Australia and central Europe. In A.B. Klimchouk & D.C. Ford Eds: *Hypogene Speleogenesis and Karst Hydrogeology of Artesian Basins. Ukrainian Institute of Speleology and Karstology, Special Paper 1*. Simferopol. pp 33-43.
- Oxley, J., (1820) 'Journals of two expeditions into the interior of New South Wales, undertaken by order of the British Government in the years 1817-18.' John Murray, London. [facsimile edition, Libraries Board of South Australia, Adelaide, 1964]

- Pardoe, C. and Webb S. (1986). Prehistoric human skeletal remains from Cowra and the Macquarie Marsh, New South Wales, *Australian Archaeology* 22, 7-26.
- Percival, I.G., (1985). Cliefden Caves - Belubula River Valley, "*The Geological Heritage of New South Wales*", National Parks and Wildlife Service, Sydney, Vol. 1, P. 21-22, ISBN 0 7305 1270 3.
- Powell, G., (June 1983) Historic Cliefden, "*Oolite*" Vol.13, No. 1, P. 4.
- Register of the National Estate. Australian Government – Department of Environment, Australian Heritage Data Base. Place ID. 14036, Place File No. 1/07/235/0019
- Rothery, A., (1924). Obituary Rothery, Albert (1841–1924) in the Sydney Morning Herald, 15 August 1924, p 4.
- Spate, A. (1993). Karsting around for bones, Aborigines and karst caves in south eastern Australia, *Helictite* 31, 13-22.
- Stevens, N.C., (1950), Note on the Occurrence of a Shelly Facies in the Ordovician at Cliefden Caves, Near Mandurama, NSW. "*Australia, Journal of Science*" Vol. 13, P. 83.
- Stevens, (1952). Proceeding of the Linnean Society of NSW, Vol. 77, 1952, P. 114.
- Thompson, J., (1997) Faces of Mandurama, Introduced by John Thompson, National Library of Australia, Cataloguing-in-Publication. P. 20, ISBN 0 642 10686X
- Trickett, O., (1908). Report on Belubula (Cliefden) Caves, "*Annual Report of the Dept. of Mines, N.S.W.*" published in 1909 by William Applegate Gullick, Government Printer, Sydney. P. 172.
- Thurgate, M. E., Gough, J. S., Spate, A. and Eberhard, S. (2001). Subterranean biodiversity in New South Wales: from rags to riches. *Records of the Western Australian Museum Supplement* 64, 37-47.
- Turner, K., (2002). Chromophores Producing Blue Speleothems at Cliefden, NSW. Published in "*Helictite*" Journal of Australasian Speleological Research Council. Vol. 38(1): pp. 3-6.
- Wallis, G.R., (1965). Cliefden Springs Barite Deposit. "*Dept. of Mines, Geological Survey. N.S.W.*", Report. No.28. (1965) P. 3-5 Printed by V.C.N. Blight, Government Printers.
- Webby, B. D. and Packham, G.H. (1982). Stratigraphy and regional setting of the Cliefden Caves Limestone Group (late Ordovician), central western New South Wales, *Journal of the Geological Society of Australia* 29, 297-317.
- Webby, B. D. and Percival, I. G. (1983), Ordovician Trimerellacean Brachiopod Shell Beds. "Lethaia", V16. Issue 3, pp 215–232, July 1983.
- Wilkinson, C.S., (1892), description of the Belubula Caves, Published in records of the "*Geological Survey of New South Wales*", (Dept. of Mines, Sydney), Vol. 3, Part 1, P. 1-5. Printed by Charles Potter, Government Printer. (Extracted from 1876 article.)