Explorers, Surveyors, Missionaries and Travellers: the first chapter of Australian speleological history 1788-1838

John Dunkley

Introduction

This paper chronicles early accounts of cave visits and limestone occurrences in New South Wales, placing the discoveries in the context of exploration, survey and settlement of the colony. In particular it acknowledges the presence and contribution of some secondary players: the Assistant Surveyors, independent travellers, and missionaries. The period covered extends to about 1836, in which year alone Thomas Mitchell was adding to the annals of Australian exploration probably the most significant and certainly the most thorough examination of this continent's then largely unrecorded surface that had been recorded to date. In that period the European newcomers made their way from the eastern catchments to where the rivers flowed west and south, settlers and squatters fanned out beyond the limits imposed by the boundaries of the Nineteen Counties, and most of the cave areas now known in New South Wales received their first recorded visits. Much of the interest in caves and limestone during this period took place on the very frontiers of white exploration and settlement.

The sequence of explorers, surveyors, amateur scientists and travellers is the same succession we still see in a newly discovered cave or karst area the world over. The explorers pushed the boundaries of geographical knowledge, published journals, received the accolades and commended themselves to posterity. The surveyors and minor expeditionaries plodded afterwards, filling in the empty spaces, opening the country to settlement and making more detailed records of resources. The occasional peripatetic traveller, adventurer, scientist or missionary appeared here and there, exploring caves.

A search for limestone may have been almost as great a motive for crossing the Blue Mountains as was the search for new pasture. The limestone deposits and caves of New South Wales, particularly the Central West, have been known since the earliest period of European exploration and settlement beyond Sydney, and a number were associated with the names of early European explorers: Lawson, Oxley, Cunningham, Hovell and Hume, Mitchell, and Sturt. The Central West is of particular interest: the first discovery of limestone in Australia (Evans at Limestone Creek, Belubula River, 1815), the first record of European limestone cave exploration (Lawson in Limekilns Cave, 1821), perhaps the first European cave tourist (Lesson at Limekilns, 1824), the first cave illustrations (Earle at Wellington, 1826), the first published cave map (Henderson at Borenore, 1830, published 1832) the first scientific work carried out in caves (Henderson and Mitchell at Borenore and Wellington, 1830), and the first limestone quarries (Limekilns ca. 1820).

Although smaller areas e.g., Bungonia (Crabb, 1998) have been chronicled in some detail, the only wider account of interest in limestone in the first years of the colony was a paper published by Ted Lane in 1975. The present paper began life as the historical background to a National Heritage Trust study of Karst in the Central West of NSW by the Australian Speleological Federation Inc. (Dunkley and Dykes, 2000). In this expanded paper I have concentrated on aspects previously unrecorded or obscure, and endeavoured to place the whole in a wider historical perspective of the early settlement of the colony. Some expanded sections and the appendices incorporate material not previously published in or readily available from speleological and other literature, and Tasmania has been included because it was not separated from New South Wales until 1825. I see the findings of explorers, scientists, travellers and even

historians as a spiralling sequence: new discoveries are made in previously 'known' areas, and old interpretations are revisited, rejected, enlarged, or discarded.

Before the First Fleet

An exhaustive review of the significance of caves in the prehistory of Australia and their use by the traditional owners of Australia has been provided by J. N. Jennings (1979) and will not be repeated here. In a broader canvas, Mulvaney and Kaminga (1999) placed in context evidence of the significance of cave sites in our understanding of Australia's prehistory. Advances in research on Australian prehistory and late Quaternary vertebrate palaeontology have depended overall in significant measure on the evidence provided by caves, crucially in some directions, subordinate in others, and this contrasts with the modest importance of caves for the Aboriginal inhabitants themselves. As a general rule, Aborigines did not live in the deep and dark recesses of caves, but camped at the entrance and only ventured further for special reasons. Rockshelters are somewhat more common sites, and in the sandstones of the Sydney basin there are thousands of such prehistoric occupation sites, many of them still uncatalogued.

The Search for Limestone

Sandstone caves and shell middens

Small caves and rockshelters abound in the Triassic and Permian Sandstones of the Sydney Basin, and their utilisation by the aborigines was mentioned in some of the very earliest accounts of the first settlement (e.g. Officer, 1789; Hunter, 1793; Collins, 1798). An Officer noted that *"Several huts, formed of boughs, had been seen; but in the greatest extent up the country that was ever made, small bodies of natives were noticed under hollow banks, and in caverns. They generally fled as the English parties approached, and when these places of refuge were examined, heaps of rushes and long dried grass appeared to be their beds."* Collins was scandalised: *"in their huts and their caves they lie down indiscriminately mixed, men, women, and children together..."*.

So caves around Sydney Harbour were certainly utilised by the original inhabitants and perhaps intermittently by the first white settlers, for the middens were mined for shells by the new settlers. Located on prime real estate or in parks, some caves were reclaimed by destitutes during the Great Depression and occupied as recently as the 1960s.

The settlement at Sydney Cove was plagued from the outset by a lack of limestone for making mortar. That observant recorder of the First Fleet, Watkin Tench mentioned that *"One of the greatest impediments we meet is a want of limestone, of which no signs appear … to find limestone many of our researches were directed. But after repeated assays with fire and chemical preparations on all the different sorts of stone to be picked up, it is still a desideratum"* (Tench, 1791). As early as March 1791 Governor Phillip was complaining to the Secretary of State for the Colonies that *"The want of limestone still obliges us to confine our buildings to a certain height, for although the clay is of a strong, binding nature, we cannot with safety carry the walls of those buildings more than twelve feet"*.

Nearly a year later Phillip was still complaining to Lord Grenville, noting that *"Your Lordship will readily conceive of how much consequence it would have been to the settlement had two or three hundred tons of limestone been sent out, and which might have been done, if those ships found it necessary to bring so much shingle ballast; for the limestone might with little trouble have been changed for the stone of this country"*. Two days later he wrote to the Secretary of the Navy along the same lines: *The great inconvenience attending the want of limestone has been pointed out; and if it was necessary for those ships to bring ballast, limestone might have been*

put on board, and would have been easily changed for the stone of this country, and which I hope the Board will order to be done on any future occasion.

As it was, lime was for many years obtained from sea-shells found in abundance along the coast, some of them aboriginal middens in Sydney Harbour, which were burnt at Iron Cove. Supplies were located on King Island and Port Dalrymple in Tasmania, and later near the Derwent and on Norfolk Island, but it was evidently more economic to utilise those from the Hunter River, Port Macquarie and Richmond River.

The problem of limestone for building continued to exercise the mind of later Governors, for example Hunter in 1796 and Macquarie in 1810. Indeed, in 1811 the Government advertised for contractors to supply good building lime. The explorers of the route across the Blue Mountains and beyond either had orders or were well aware of the importance of recording discoveries of limestone. Thus Governor Macquarie reported direct to the British Government on Surveyor Evans' discovery in 1815 of high quality limestone at what is now Cliefden and Walli. In 1829 Robert Mudie discussed the problem at length (see Appendix 1) and well into the 1830s Thomas Mitchell was directing his Assistant Surveyors to record outcrops of limestone, both for resource exploitation and for his interest in cave bone breccia. In the light of this we can understand why Mitchell's journals contain numerous references to limestone and caves, and why, in a journal chronicling the day-to-day march of exploration he went out of his way to include references to caves which he had visited at other times, for example his descriptions of visits to Cheitmore Cave and the Big Hole.

First reports of limestone and (sandstone) caves

At the outset we have to recognise that until quite late in the nineteenth century, no significant distinction was drawn between what we would now refer to as *karst* caves in limestone, and artificial grottos, rockshelters and shallow sandstone caves. Both limestone and caves were regarded as significant more for their contents than for any consideration of genesis or aesthetics.

Reporting of the first limestone in the colony is sometimes attributed to Ensign Francis Barrallier. Less well known is his early record and passing use of a cave, albeit in sandstone, and the significance of this in later relocating his route. A French emigrant, engineer to the colony and aide-de-camp to Governor King, Barrallier in 1802 and 1803 made three short explorations of the Burragorang Valley country west of Picton, bounded by the Nepean, Warragamba and Wollondilly Rivers. Limestone was evidently on the minds of his superiors, for on 2 October 1802 Governor King wrote of Barrallier's first trip: *"The officer I sent to endeavour to pass the mountains has returned from his first trial with little hope of effecting it, or making any new discovery, except a very imperfect limestone and a better kind of iron ore than has yet been found* (King to Hobart, 30OCT1802).

Barrallier must have talked up his discoveries, as explorers do, for a month later, on 1 November George Caley wrote to Joseph Banks that *"I was informed that he had discovered a new river, limestone in great abundance, iron almost pure, and had been 50 miles or better in a western direction, but of all this I have doubts"*. Possibly based on earlier interpretations of his route, some writers (e.g. Battye, 1984) believed that Barrallier was writing about the prominent limestone bluffs at Church Creek. This is not possible, because:

1. Although limestone was recorded on his *first* expedition, this ended at Tonalli Peak, some 14km east of Church Creek. Caley and King wrote of it before the second expedition. The "imperfect" limestone he saw therefore lies east of the Wollondilly River.

2. His comprehensive report on the second expedition does not mention limestone.

3. Recent researchers (e.g. Andrews, 1998) have argued persuasively that on the second expedition, Barrallier descended to the Kowmung River via Byrnes Gap and Cedar Creek, not via Kowmung Gap and Church Creek as earlier researchers assumed, and that he did not ascend the Kowmung upstream of its junction with Cedar Creek. This being so, he did not see Church Creek.

Barrallier's Cave

However, Barrallier did discover a cave, albeit in sandstone; indeed the location of the cave is of historical interest because it supports evidence in favour of his route to the Kowmung. His journal for 25 November 1802 records that:

"At six o'clock in the evening I found myself at a distance of 2 miles from the western passage. I was here obliged to ascend a very steep hill on the summit of which I found a cave large enough to contain twenty men. I was then half a mile from the passage, and I sent two men in order to discover it, instructing them to ascend the mountain at the north of this passage. The rain compelled me to seek a shelter for myself and my men in the cave which, the natives assured me, was the home of wombats. I waited till 7 o'clock in the cave for my two men …".

Barrallier's exact route has been the subject of academic debate for a century - possibly attributable in part to mistranslation from his original French – but is of more than academic interest because he went so close to finding a route across the mountains. All writers mention Barrallier's cave, but until 1993 no cave fitting his description was known. The question was, where is it?

Cambage (1910) assumed it was just below Kowmung Gap and that Barrallier then descended to the Kowmung River via Church Creek, a route supported on different grounds by Brownscombe (1992). Else-Mitchell (1938) argued that he travelled via Byrnes Gap and Church Creek. None of the proponents of the Church Creek route pointed out the obvious fact that if this had indeed been the route, Barrallier's comprehensive journals would have noted the prominent limestone cliffs. While these writers had relied variously on journals, maps and their own bushwalking knowledge of the area, not until the 1990s was real effort made to locate the cave, and as a result two were located close to Byrnes Gap. The site promoted by Macqueen (1993) is probably not that used by Barrallier, for in 1998 Alan Andrews, an experienced surveyor himself, argued a better case for the one he discovered. Located 4km NNW of Yerranderie, above a tributary north of the Tonalli River, this cave is about 10m long and 3m wide, commodious and comfortable enough for camping.

Whichever is correct, this is the first identifiable cave described in the literature of early Australia.

Beyond this cave Barrallier passed through Byrnes Gap, noting more sandstone caves: "*The width of this passage is about half a mile; its sides are perpendicular. The mountain is very steep and full of caves which are the homes of various wild beasts which go there in crossing the swamps near by."* The next morning he descended Cedar Creek to the Kowmung River. Had he followed the Kowmung upstream at this point he may have seen the limestone on Church and Lannigans Creeks, and possibly found fame as the discoverer of a route across the Blue Mountains. But it was in flood from the previous night' rain, and on his own account and accompanying map, he turned downstream at that junction and was finally defeated in attempting to ascend Christys Creek.

Explorers beyond the mountains, and the first reports of limestone caves

Most of the early inland explorers recorded limestone and caves, which was to be expected: they were chosen because they were meticulous observers and recorders. From the Colonial Office, Lord Bathurst issued a set of standing instructions specifying that an explorer should, so far as possible, make careful written observations of the animal, vegetable and mineral potential of the country passed through, to preserve specimens where feasible, and make drawings or detailed notes where it was not.

That they were well aware of the importance of finding deposits of limestone was highlighted by independent observers such as Rene Lesson (see below). Furthermore, an 1820 review of Oxley's journeys noted that *"in their way they discovered, not a gold nor silver mine, but (what is infinitely more valuable to the colony, and had never been discovered there before) plenty of good limestone"* (Quarterly Review, Nov. 1820, p. 424). Later, Thomas Mitchell issued explicit instructions to some of his Assistant Surveyors, for example when briefing John Rogers in 1830:

8 …You will also note particularly where limestone occurs in all your Survey and this you will tint on your Map by a grey made by mixing blue and red together shewing something like the extent of the limestone rock" (ref 487 in Major Mitchell's map) (Mitchell to Rogers, 24/7/1830, 4/6909, AONSW). These instructions explain the early and rapid recording of so many limestone deposits in the NSW Central West.

'Firsts' in the NSW Central West

Quite a few 'firsts' relating to limestone and caves in Australia thus took place in the Central West of NSW. Except for Barrallier's passing, vague reference to *"imperfect limestone"*, the first stratified limestone in Australia was located by Deputy Surveyor George Evans, at Limestone Creek (Walli) on 24 May 1815 (Evans, 1815). The significance of this find is evident from Governor Macquarie's report to the British Government that *"Among other things he (Evans) has brought Specimens of Lime Stone, which prove to be of the best quality, and will of course be of Infinite Service whenever Colonization shall take place there."* (Macquarie, 1816)

Wellington Caves and Borenore Caves are the sites of several 'firsts' or 'near-firsts' for Australia. In 1830 Thomas Mitchell and John Henderson independently carried out the first scientific investigations of caves. In conjunction with a dissertation on his theories of the origin of the red earth and bones, Henderson's (1832) published sketch plans (without a scale) of 'Boree Cave' (i.e. Tunnel Cave, Borenore, BN-25) and of 'Wellington Cave' (i.e. Mitchell Cave WE-5) are our first published cave maps. His notes also include a diagrammatic cross-sectional sketch of the Arch and karst at Borenore. Mitchell's work was not published until 1838 and includes professional surveys of 'Large Cave' and 'Breccia Cave' at Wellington, the former being the present Cathedral Cave which is shown to tourists, the latter now known as Mitchell Cave (WE-5). Finally, Mitchell's accompanying *"Geological Sketch of the Wellington Valley"* is the first geological map of surveys, and marks the *"Entrance to large cave"* and *"Cave containing Breccia"*.

William Lawson, Rene Lesson and Alan Cunningham

Not well known is that William Lawson, the surveyor of Blaxland, Lawson and Wentworth fame, can be credited with the first written record of a limestone cave visit in Australia when he visited Limekilns Cave for five hours on the night of 9 November 1821. Ken Pickering (1971) described Lawson as Australia's first speleologist, but this first recorded entry to a limestone cave scarcely qualifies him as a speleologist, a status better deserved by Thomas Mitchell. Lawson wrote:

"Here is a curious cave through a solid rock of limestone. Its entrance is very narrow. At nine o'clock at night I took four men with 3 candles and proceeded into at about 100 yards. At the end

is a fine pool of clear water. In many places for several yards together I was obliged to creep on my hands and knees. The inside of the cave is very curious and well worth seeing. I got some fine specimens. Came out at about one o'clock in the morning."

This is probably the cave referred to in the Sydney Gazette of 6 October 1821, which reported *"A cave, of considerable dimensions, has been recently discovered in the neighbourhood of Bathurst; and some very beautiful specimens of stalactites have been sent to town, which were procured in it. We hope shortly to be able to lay before our Readers a more particular description."* No more particular description was forthcoming, and various writers have ascribed this report variously to Abercrombie or just possibly Jenolan (e.g. Havard 1934), while Lane (1975) considered it could refer to either Wellington or Limekilns. However the candidacy of Limekilns is enhanced by its proximity to Bathurst (25km compared to 73km to Abercrombie and 150km to Wellington), the fact that Lawson's visit was barely a month later, and the fact that both Lawson and Lesson (1828) mentioned its then fine decoration.

Whatever the case, within a few years Limekilns may have been the destination of our first recorded cave tourist. From 17 January to 20 March 1824 a French corvette stood in Port Jackson (perhaps for repairs) during a 3-year long scientific expedition around the world. The expedition's doctor, Rene Lesson seized the opportunity to travel to Bathurst, barely a decade after the city was established. In February 1824 he observed:

"*To the south-west, well beyond Mt Molle, there has been discovered the mineral substance of which New (South) Wales seems deficient, limestone, of which the English experience the greatest necessity in the construction of their buildings, since the coast does not produce enough shells to satisfy needs. This substance was highly desired, and it was not without sharpest satisfaction, that the cave was found to the north of and sixteen miles from Bathurst, (and) whose vault is hung with thick stalactites of a calcareous alabaster, providing a highly regarded lime.*

He continued: *"The way through it is covered with splendid thick stalactites of calcareous alabaster as white as sugar. The lime derived from it is very adhesive and consequently rated highly; only it is very expensive"*. Whether this account was based on a personal visit or on hearsay (for Lesson was in Bathurst barely two or three days), it appears likely from his description that the area was already being used as a limestone quarry, a surmise supported by the name Limekilns on Cunningham's 1823 map (see Field, 1825). On 28 April 1823 Cunningham also recorded and named limestone at Apple Tree Flat, near the head of the Cudgegong River: *"we halted in a vale beneath a part of the boundary hills, which was studded with limestone of an excellent quality"*

John Oxley

Notwithstanding Evans's accomplishments, when it came to more ambitious exploration, Governor Macquarie selected John Oxley, Surveyor-General since 1812. Wellington Valley was first recorded in August 1817 by Oxley, who on a further expedition in 1818 recorded: *"The hills bounding the east side of Wellington Vale being found of the purest limestone, of precisely similar quality with that found at Limestone Creek"*. He went on to cross the Bell River to the present site of Wellington Caves, noting high quality limestone as being quite common, although there is no record of caves. Oxley also provided the first records of Wombeyan Caves while searching for pasture land for John MacArthur shortly before his death in 1828.

Charles Sturt

Curiosity, perseverance and meticulous recording are among an explorer's stock-in-trade, but their interest in caves varied. Charles Sturt, for example, was peremptorily dismissive of caves he visited at Molong: "*The caves into which I penetrated, did not present anything particular to my observation; they differed little from caves of a similar description into which I had penetrated in*

Europe…I am not aware that the remains of any extinct species have been found, or that any fossils have been met with in the limestone itself".

This being in 1828, it appears that cave bones had already been added to the list of resources to be recorded, and by implication caves were of little significance if they lacked such contents.

To the south – Mark Currie

In 1823 Captain Mark Currie was despatched from Moss Vale by Surveyor General Oxley to explore country south-west beyond the frontier, then at Lake George. Currie's party encountered limestone at Limestone Plains, Michelago and possibly Rosebrook before he turned back just north of Cooma. Near Michelago on 5 May he *"Found lime-stone and iron-stone where we camped, the former in great abundance"*. Three days later he discovered London Bridge, *"a natural bridge of one perfect Saxon arch"* and became perhaps our second recorded visitor to a limestone cave. By late 1824 the Limestone Plains on the present site of Canberra had been settled.

Hamilton Hume & William Hovell

En route from Sydney to Port Phillip, on 28 October, 1817 W.H. Hovell and Hamilton Hume recorded limestone in the valley of the Murrumbidgee near Wee Jasper, observing *"several large and deep holes, apparently the outlets of some considerable subterranean cavities; rich, probably, in the organic remains of these regions"*. They went on to describe the limestone and its characteristic dip slopes.

George Bennett

An amateur natural historian with other interests in anthropology, biology and even animal history, Bennett was in Australia in 1829 and 1832, on the latter occasion retracing the steps of Hume and Hovell, roughly along the line of the modern Hume Highway. On 11 October 1832 he made a one-day, 30-mile detour from Yass to Wee Jasper and back, noting the affinity of the kurrajong tree for the limestone, and mentioning that *"some caves have been lately found in the limestone rocks about this selection; and since the valuable discovery of fossil bones in those at Wellington Valley, by Major Mitchell and others, limestone caverns have become one of the colonial lions; these, therefore, were pointed out to me as objects of great curiosity; I found them however very small, and they did not repay the trouble of getting into them"*..

At least until construction of Burrinjuck Dam, it seems these caves were on the original Cavan Run, part of the property now owned by Rupert Murdoch. In 1940 Potter was still able to identify the tree on the river bank at Cavan indicating the spot where Bennett crossed the river, beyond which was *"amongst limestone rocks a cave which would not admit a man erect"*. In Bennett's time the Murrumbidgee was the acknowledged limit of the colony.

On the return journey to Sydney, on 19 November he visited "Gudarigby" property, made an excursion to "Narrangullen" and visited "Gudarigby Caverns" at Cave Flat, now normally flooded by Burrinjuck Dam and better known to divers than speleologists. By lighted torches his party picked its way through the cave *"at a guess, one hundred and twenty yards, or even more …"*. His accompanying sketch is our first cross-section cave map. Bennett went on to become the first Secretary of the Australian Museum in Sydney.

Another traveller (anon., 1838) arrived in Yass on 26 April 1837 and next morning set out: *"the ladies in a cart, with tents, beds and bedding, provisions &c and the five gentlemen on horseback. We arrived at Cavan at half-past four, intending to proceed at once to the mouth of the cave, and there to encamp all night, having been told that they were distant only four miles from Cavan"*.

However, the distance was more like seven or eight miles so the party stayed at Cavan and set out again at seven on the morning of 20 November to explore the caves (see Appendix 2). This appears to be one of the earliest accounts of a purely tourist excursion to caves.

Robert Townson

Possibly the first notable cave visitor to visit Australia, Robert Townson (1762-1827) reached Sydney in July 1807. Well qualified in medicine, chemistry and natural history, Townson's account (1797) of his travels in Hungary includes accounts of visits to Aggtelek and Silica caves in Hungary in 1793. He arrived in Australia with promises of grants of land and money for scientific equipment but, apparently thwarted by Governor Bligh, Townson was instrumental in his deposition, and it was not until 1810 that Macquarie granted him 1000 acres near Campbelltown. In a short biography of Townson, Trevor Shaw (1997) suggested that this experience diminished his enthusiasm for scientific matters; certainly there is no record of any further interest in things exploratory, scientific or speleological. Sometime between 1825 and 1827 the first white painter of Australian caves, Augustus Earle produced a portrait of Townson, now in the Mitchell Library in Sydney. He died in 1827 and is buried at Parramatta.

Australia's first speleologist?: Surveyor-General Thomas Mitchell and his Assistant Surveyors

Under pressure from the increase in free settlers, in 1826 Governor Darling found it necessary to adopt a scheme whereby settlers could select land prior to survey, but then have it at once surveyed, valued and sold. To limit its extent he set a boundary beyond which land was not to be sold or let – the boundary of the Nineteen Counties. The problem was, existing maps of the Colony simply lacked substance. An accurate survey of the nineteen counties was urgently needed, but there was little comprehension of the magnitude of the task, and indeed it did take much longer than the Governor envisaged.

The man of the moment was Major Thomas Mitchell. Appointed Deputy Surveyor-General in February 1827, by the following year he was Surveyor-General following Oxley's death, was expanding his staff of Assistants, and had commenced a survey of the land within Darling's limits. He deployed the men, inspected them in the field, examined all the ground he could, collated the results and, six years later, published a superb map of the Nineteen Counties. And in this role and that of an explorer on the expeditions of 1836, he explored, described, surveyed, studied and wrote scientific articles on caves and their contents in widely scattered parts of New South Wales. He was possessed of boundless self-confidence and a strong ego along with energy, determination and perseverance, a strong intellectual curiosity, and an urge to publish his discoveries. All the qualities of a speleologist. Others may have been in caves before, and some, as we show below, may have published scientific investigations before him, but Mitchell was in fact Australia's *first speleologist*.

Mitchell's interest in limestone and caves

Historical accounts of Mitchell's contributions to cave science in Australia have been published (Foster, 1836; Lane and Richards, 1963; Osborne, 1991). The present paper will not repeat this but will place it in a wider perspective, examine the additional contribution of his Assistant Surveyors in the context of the Map of the Nineteen Counties (Mitchell 1834b), and discuss his driving motivation, including his relationship with Governor Darling and Dr John Henderson.

Mitchell's attention to caves has been attributed to his involvement in the intellectual fervour following discovery of the Wellington bone deposits by George Rankin in 1830, although I will argue elsewhere (Dunkley in prep.) that rivalry with John Henderson played a part also. Certainly his *Journals of Three Expeditions* devotes an entire chapter to the bones, but none of this was an integral part of his exploratory mission and the chapter is a retrospective compilation, not a narrative journal like the rest of the book. Further, he had been caving earlier, for example at Bungonia in 1828 (probably the Grill Cave). This was before the bones were located, so that discovery may have been no more than a precipitating factor.

Several motives therefore seem to lie behind his interest in limestone and caves:

1. Topographical surveying: in his role as Surveyor-General, he knew that the only way to properly divide the Colony was on a topographic basis, and the first great need was to record that topography.

2. Limestone resources: even 40 years after settlement, the importance of supplies of limestone for building was still exercising the mind of the government as new towns were established in the interior. Furthermore, limestone gave some indication of soil better than that produced in the sandstone country of the Sydney basin, as Mitchell himself noted: *"It is only where trap, or granite, or limestone occur, that the soil is worth possessing, and, to this extent, every settler is under the necessity of becoming a geologist…"*

3. Intellectual curiosity: Mitchell had a personal interest in the great paleontological debate emanating from the discoveries at Wellington Caves

4. Rivalry: the intellectual debate over the significance of the bones produced a fervour of interest, and Mitchell's ego demanded he investigate before others had an opportunity. In particular, I believe Mitchell was determined that his views would prevail over those of John Henderson and that this was the reason for the haste with which bones were despatched to London, and why he devoted an entire chapter of his *Three Expeditions* … to the bone saga.

Mitchell and the Wellington Bones

The Sydney Gazette of 25 May 1830 published a letter dated May 21, signed "L" (attributed to Dr J. D. Lang), announcing that George Ranken of Bathurst had *"in a late excursion to Wellington Valley … visited and explored a remarkable cave about two miles from the settlement, the existance of which had been known for a considerable time and the entrance of which is in the face of the limestone range"*. It went on to describe Ranken's discovery (in Breccia Cave) of *"a vast quantity of bones of various sizes and generally broken, some strewn on the floor of the cave, but the greater number embedded in a sort of reddish, indurated clay along its side"*.

Foster (1936) tells us that Surveyor-General Thomas Mitchell had fortuitously been about to leave Sydney to examine work on the Great West Road to Bathurst. Indeed, he left only four days after the Gazette's announcement, joined Ranken in Bathurst, and on June 23 they hastened towards Wellington.

Mitchell left Sydney only four days after the Gazette's announcement. Foster (1936) tell us that this departure was fortuitous and that his motive was to examine work on the Great West Road to Bathurst. However, I argue below that there was another more pressing motive. Whatever, the Surveyor-General joined Ranken in Bathurst, and on June 23 they hastened towards Wellington, On June 26 investigations commenced in the Breccia and Cathedral Caves and a third cave which *"did not reveal any bones"*. On the following day they made a hard and fruitless ride of 45 miles

to investigate a report of another large cave north of the Macquarie River. On the 28th Mitchell made his well-known survey of "the bone cave", and for the next few days mixed business with intellectual pleasure, on the 30th examining another small bone cave east of Wellington Valley, and on the first three days of July combining some surface surveying during the day with sketching the cave at night. Packing the bones carefully, he left for Molong on July 4th, reached Bathurst on the 9th and Sydney on the 24th. On August 14th Dr Lang left Sydney for London with preliminary details which he forwarded to Robert Jameson, Regius Professor of Natural History at the University of Edinburgh and they were published in 1831.

By 13 October Mitchell had written a paper and despatched it to London where it was read to the Geological Society on 13 April, 1831, a date he was at pains to remind readers of in publishing his studies more accessibly in 1838, as a whole chapter in his *Journals of Three Expeditions ….*

John Henderson and Thomas Mitchell

But in the same month of June 1830, a John Henderson also turned up in Wellington, then a small military garrison on the frontiers of white settlement. In a historical survey of scientific studies of the red earth and bones, Osborne (1991) devoted a few paragraphs to Henderson's work, but his very existence had apparently escaped the notice of Foster (1936), Lane & Richards (1963) and Augee (1986) in their comprehensive papers on Mitchell and Wellington. No-one has remarked on the curious juxtaposition of these first two scientific studies on Australian caves (but see Dunkley, in prep.).

Henderson wrote:

"From Van Diemen's Land I proceeded to New South Wales; and continued to reside at Sydney for several months. With the view of examining the Geological formations of the country, and comparing it with Van Diemen's Land, I made another pedestrian excursion, in a westerly direction, into the interior of the country. Having arrived at Wellington, which is about 240 miles from Sydney, I remained there for some time, in order to observe the phenomena attending the deposition of those fossil remains which have lately been discovered in the Limestone Rock. Having, at the request of General Darling, prepared on his account, a collection of these for transmission to England, I addressed him a Report on the subject; and the one here published, has been prepared from my notes, which I happened to have retained in my possession".

This account is dated at Wellington, July 1st, 1830, but from the last sentence, must have been rewritten later. It is clear both from his own statement above, and from his detailed descriptions, that some time was required on site. Henderson must have moved quickly to have left Sydney after the Gazette account appeared on 25th May, travelled to both Boree and Wellington (surely not entirely a *'pedestrian excursion'*!), carried out some excavations and written up the results by 1st July.

Like Mitchell, Henderson had realised the significance of the account in the Gazette. He too was interested in the megafaunal fossils. They each spent time in a tiny village on the frontiers of white settlement, at most only days apart and quite probably at the same time. They each examined Boree (Borenore) Caves for evidence of red earth and bones, Henderson during the same trip, Mitchell apparently some years later (although he claimed in 1838 to have discovered them *"during a cursory visit to them some years before…").* Although it is not stated whether he really wrote it there, Henderson's account is dated at Wellington the very day (July 1st) on which Mitchell sketched the Altar in Cathedral Cave. Henderson published his account in Calcutta in 1832. Mitchell's first paper was published in 1831, his comprehensive report in 1838.

Yet when Mitchell and Henderson did finally publish their accounts, neither mentioned the other. Not a single word. On the evidence presented, it is simply not credible that they failed to meet in Wellington on or about July 1, 1830. Even had they missed each other on site, one would

surmise that they would make a point of meeting in Sydney. It was a relatively small place and Henderson was a man of some means and relative leisure, being on extended furlough from India. He had access to the Governor, who he says requested him to gather a collection of bones *"for transmission to England"*. He would therefore surely have found the time to discuss his theories with the Surveyor-General. That they failed to meet during sojourns in the Wellington and Sydney of 1830 defies belief. So, what is the explanation?

We know from Henderson's account that upon returning to Sydney from Wellington, he unsuccessfully petitioned Governor Darling to assist him in an endeavour to travel (at his own expense) on explorations beyond the Nineteen Counties and in particular west of Wellington (Henderson op. cit, pp. ix-xi). We also know that on the day before the Sydney Gazette item (i.e. 24 May, 1830), Mitchell had written to Colonial Secretary Hay in London, seeking permission to organise an expedition through the centre of Australia to the west coast. This lapse of protocol certainly did not endear him to the Governor.

Further, Henderson's book markedly deprecated both the professionalism of the Surveyor-General's Department and specifically the wisdom of expending public money on the road to Bathurst, and presumably these views were known at the time of his visit. In this light, perhaps, upon learning of the bones, and no doubt aware of the Governor's request to Henderson about collecting some, Mitchell used the power of his office to decide he urgently needed to inspect the road to Bathurst, visit Wellington to plan the survey, and simultaneously seize the opportunity to boost his profile and credentials in the home country. On returning, quite probably Mitchell's ego did not allow him to associate with someone who had designs on exploring country he wanted to examine for himself, who had confided those intentions in and sought support from the Governor, who had criticised his administration, and whose views about the bones were at odds with his own anyway.

It is a matter of record that Mitchell and Darling never got along with each other. For example, shortly after Mitchell's return to Sydney in July, Darling was complaining to Colonial Secretary Hay in London that: *"The attention of the Surveyor-General, who seems injudiciously anxious to do everything himself, is so much occupied in the Road Branch, that, to say the least, the more important duties of his Office* (i.e. the trigonometrical survey – JD) *cannot be attended to in the same degree as if that Department had not been placed under his superintendence"*. Darling was often critical of Mitchell's tardiness in producing his map (e.g. letter to the Under Secretary for the Colonies on 28 May, 1831 – Historical Records of Australia XVI, p.222), and before the end of the year he did attempt to strip Mitchell of responsibility for Roads and Bridges. A few months later Darling was himself dismissed, and in the process attempted to secure the dismissal of Mitchell.

Mitchell and Boree (Borenore) Caves

Mitchell found time to visit Boree Caves briefly for the same purpose of bone hunting, at the very beginning of his Australia Felix expedition, on 18th March, 1836 (Mitchell 1838, pp. 6-7), and after Boree, to scour Oakey Creek for the same purpose. His diary states that the time for cave exploration was available *"as it was necessary to grind some wheat with hand-mills, to make up our supply of flour, I was obliged to remain a day at Buree; and I, therefore, determined on a visit to the limestone caves, by no means the least remarkable feature in that country"*. However, George Rankin was fortuitously at hand, having accompanied him from Bathurst and together they spent a full day in exploration:

"The limestone occurs chiefly in the sides of vallies (sic) *in different places, and contains probably many unexplored caves. … I had long been anxious to extend my researches for fossil bones among these caves, having discovered during a cursory visit to them some years before, that many interesting remains of the early race of animals in Australia were to be found in the deep crevices and caverns of the limestone rock. … I was anxious to ascertain, by a more*

extensive examination of the limestone country, whether the caves containing the osseous breccia, presented here similar characteristics to those I had observed in Wellington Valley. … It may be imagined what a vast field for such interesting researches remains still unexplored in that district, where limestone occurs in such abundance" (pp. 6 - 7).

This is curious. Surely a major expedition would procure supplies before leaving Orange on 15 March. It is difficult to escape the conclusion that Rankin, who was not part of the expedition, had been asked to come specifically to help in the cave exploration, and that on a pretext, the expedition was delayed a day to enable them to do so and to strengthen Mitchell's stature.

Further, Mitchell's claim to have discovered bones at Boree *"during a cursory visit to them some years before"* (i.e. before 1836) has to be tested. On July 24th 1830 Mitchell had recalled Assistant Surveyor John Rogers from the Goulburn River area and despatched him to Bathurst, Molong and Wellington, *inter alia* with specific instructions to mark occurrences of limestone (see below). However, Rogers' own reports suggest he was first appraised of the existence of Boree Caves on 9 September, 1830. If Mitchell had already visited Boree, Rogers would have known. Thus, if Mitchell did discover bones there, it must have been after Henderson's visit.

Reporting on the Bone Caves

Neither Mitchell nor Henderson was particularly qualified academically to study the deposits. Mitchell was surveyor with some geological training; Henderson a doctor whose writings reveal a well-educated man and a sound facility with zoological nomenclature. Both had wide-ranging intellectual interests of that peculiarly nineteenth-century kind, although Mitchell was the more accomplished polymath. Mitchell had advantages to posterity in that his conclusions foreshadowed modern, post-Darwinian thinking, and he had the connections to promote his views more widely. Indeed, Darwin visited Sydney in 1836 and Mitchell continued correspondence and met him in London the following year. Henderson attributed the distribution of bones to a flood sweeping down from Canobolas, past Boree and strengthening towards Wellington, and predicted the discovery of more bones along the intervening river beds. Not exactly the Biblical Deluge, but presumably he was more strongly influenced than Mitchell by the recent publication in 1824 by Rev. Buckland of his *Reliquiae Diluvianae*. Mitchell also suggested inundation of the caves, but subsequent to rather than a cause of the distribution of bones.

Certainly Mitchell's account is more intellectually rigorous. He had the benefit of such peer review as was available (e.g. from Professor Richard Owen in London, and from Lang who nevertheless remained anonymous, presumably to avoid becoming embroiled in controversy about the Universal Deluge). He had astutely arranged for Lang to convey the preliminary account to London and for a paper to be read before the Geological Society of London in 1831, while Henderson had to be content with an obscure missionary press in Calcutta. His maps, of course, were professionally executed whereas Henderson's were no more than rough field sketches.

Just what happened to Henderson's bones is unclear. He reported to Darling that several boxes of bones *"are now ready for transmission to Doctors Fittan and Buckland of London"*. Buckland was not the best choice of recipient, and Owen (1877) does not mention Henderson in his seminal work, writing in the preface: *"The exploration of ossiferous caves has hitherto been limited to those originally discovered by Sir Thomas Mitchell"*.

That much said, Henderson was no more an opportunistic amateur than was Mitchell. A former Surgeon in the Bengal Army, he had several scientific papers to his credit and founded the Van Diemens Land Society in Hobart in 1829. On returning to India he engaged in a variety of mercantile pursuits with the East India Company, travelled incognito across the High Himalayas and Karakopram Pass to Yarkand, and died in Ludhiana shortly after his return in 1836.

Conclusion to the Bone Saga

So, less than a year after the discoveries at Wellington, Darling had been dismissed, Henderson had returned to India and only Mitchell was left standing, his reputation if anything greatly enhanced. Without Mitchell, Henderson's writings might now be regarded as the pioneering scientific account of caves in Australia, and recognised as first in a succession of studies of the Wellington bones. It seems very likely that Mitchell recognised an opportunity, his motive had elements of career advancement as well as intellectual curiosity, his means was his office, and all were driven by his energy and ego. Here, it seems, is a first example of intellectual rivalry, jealousy and possessiveness of a kind not unknown to later generations of speleologists and even scientists!

Henderson's contributions in retrospect

Thus, Mitchell prevailed over Henderson. Nevertheless, Henderson did have three other interesting, if minor claims on the history of karst science in this country (Dunkley, in prep.). His sketches of Boree and Wellington Caves were the first published maps of Australian caves, and he was also the first to comment, albeit in a rambling manner, on the supposed effects of fire or heat on limestone, erroneously attributing at least some of the product to volcanic activity:

Sometimes its surface would seem as if it had formerly been exposed to strong heat, in which case, the rocks it forms, are of a harder texture, and assume a more rugged aspect. The first appearance of the effects of fire, exists, as has already been mentioned, on the surface of some portions of the limestone range; there would be, however, a considerable degree of doubt attached to this, if unsupported by other evidence. Secondly, when a fire is lighted in the vicinity of the limestone, it converts a portion of the superstratum of soil into a brick, very much resembling the red stratum in which the bones are found preserved

Fifthly, the most convincing evidence however, of the effects of fire, is to be met with, at a place called Nauregal, twelve miles from Wellington, where I discovered a hot cave in the limestone, from which warm fumes continue to be emitted. I regret much being unable, notwithstanding all my exertions, to trace further the source of this internal combustion.

The last-mentioned site is intriguing – where is it? Finally, he appears to have been the first to draw and write abut karst topography:

"These (limestone) hills present, generally, a smooth surface, but in certain situations, the rock protrudes in large masses, assuming sometimes, the appearance of the spires and ruins of a deserted city. This is particularly observable in the vicinity of the caves at Boree".

From Boree to Australia Felix

After leaving Boree, Mitchell's most famous expedition proceeded to south-west Victoria. On this and other excursions he appears to have gone out of his way to track down reports of caves or even to return to caves which he had visited earlier, and it seems he similarly instructed his Assistant Surveyors after he was appointed. His journal records exploration of caves at Glenelg River, Bungonia, Cheitmore and Big Hole.

The Assistant Surveyors and Major Mitchell's Map

In 1834 Mitchell published his *Map of the Colony of New South Wales*, commonly known as the Map of the Nineteen Counties, and still regarded as a feat unparalleled in topographical mapping. Commenced in 1828, it marks almost every creek, spur and ridge of any significance in a huge arc from Moruya west to Tumut, north to Wellington and Tamworth, and east to and north of

Taree. Not quite every creek. - a few were missed by Mitchell's less assiduous Assistant Surveyors - but many maps remained the authoritative source and/or were not corrected for more than a century, following the advent of aerial photography. In some cases the corrections and additions waited until the time of bushwalkers such as Myles Dunphy whose Blue Mountains maps in turn became authoritative for the next 50 years.

A supreme egotist and not one to sell himself short, Mitchell wrote that *"A survey connecting a surface extending across 17 degrees of latitude by chain measurements, tied together and verified by triangulation, exists nowhere else, that I am aware of, on the globe"* and *"I consider it one of the most accurate specimens of constructive plan drawing ever produced of an extensive territory on the same scale"*.

About 900 local maps were prepared over 6 years at a scale of 2 inches to one mile, forming the basis for the main map. An example of one such map is that showing the location of Wellington Caves, in Mitchell (1838), ch. XV. To achieve this Mitchell drove his men hard and his letters to many contain admonishments for real or perceived failure to perform. At times it appears that even he did not fully appreciate just how difficult the country was to survey, at least until the task was completed, when he could acknowledge that
"It is to be regretted that the public should know so little of the arduous labours of the surveyors, which have been so long and silently devoted to procuring geographical materials of a much more perfect description"(anon – almost certainly Mitchell himself – p. 345). (On the Trigonometrical Survey ……in)

The work was undertaken with three objectives: to precisely locate land grants, to divide the colony into counties and parishes, and to plan construction of public infrastructure such as roads and bridges. From these it was expected that the permanent establishment of towns could follow more readily. The survey was done by triangulation, some of the high points being Mts Colong, Werong, Murruin (Mt Shivering) and Jenolan. Interestingly, the highest of all, Mt Bindo beside the Mt Victoria – Jenolan Caves road, was apparently not one of them.

In much of the really difficult country, particularly to the east of the Divide, as much as possible of the chaining between triangulation points was done along major high ridges, so that some significant limestone areas such as Colong and Tuglow were missed because they were deep in valleys. The course of many rivers was sketched in using an intersection method.

We have seen above that Mitchell's role in instigating scientific interest in caves in Australia, particularly at Wellington, is well documented. Recorded in his journals as an explorer, but less widely known, is the way in which this led him to follow up reports of caves throughout the colony. Even less known still is the outcome of an insistence that the occurrence of limestone and caves be marked wherever encountered by his Assistant Surveyors, who included Granville Stapylton, John Rogers, Robert Dixon, William Govett and Henry White. It is only in recent years that the endeavours of some of these have come to light (Andrews, 1992). Some kept journals, as did Mitchell on his expeditions. Stapylton's journal (Andrews, 1986) was actually written by one of his assistants but there is no doubt it is his. Mortimer Lewis wrote so comprehensively that a book could be filled with his work and it is unfortunate that his brief sojourn as surveyor (before becoming Colonial Architect) was to the north of Mudgee in an area not greatly endowed with limestone. The work of others e.g. John Rogers, can be appreciated only from a perusal of their original survey books, monthly returns and letters to and from the Surveyor-General. The monthly returns allowed one line per day briefly indicating work performed, so that references to geological features are often scanty and some observations may not be recorded for posterity. In most cases they were also the first European explorers to pass through the country they surveyed.

The survey teams included convicts of good repute who were rewarded with remissions of sentence. However, some of the surveyors, such as Stapylton had difficulty supervising the convict assistants.

Granville W C Stapylton

Granville Stapylton was appointed on 9 May 1829. To an extent his journey entered some of the country first explored only a few months earlier by that world traveller George Bennett, naturalist and first secretary of the Australian Museum. Stapylton recorded the location of the 'Gudarigbee' Caverns as *"entrance to large caves of limestone formation"*, on the Murrumbidgee River just upstream of its junction with the Goodradigbee. He also trecorded the location of the caves in the Goodradigbee Valley near Wee Jasper, first noted in passing by Hovell and Hume in October 1824.

After this he ascended the valley of the Goodradigbee. Unable to trace the river through the gorge south of Peppercorn Creek he traversed to the west under Peppercorn Hill and arrived at Cave Creek. He noted the underground course of the creek in this area (i.e. the Cooleman Caves), then headed south, far beyond Bennett's farthest point on the Tumut. Reaching the Yarrangobilly River junction, he passed through Lobs Hole and beyond Ravine. Just how far beyond Ravine is difficult to determine. His map would suggest that he reached to within perhaps 10km of Yarrangobilly Caves. Yet on his map, further downstream – at the location of what is now Wallace's Creek – is a note *"Limestone Rock and entrance to Caves*". Perhaps it was information from the Aborigines, misplaced.

Stapylton's journals were recorded by an amanuensis and presumably because of this, record a good deal of ill-feeling and invective directed at Mitchell, suggesting that they were narrative rather than dictated. He was killed in an attack by aborigines in May 1840, near the present site of Brisbane.

Robert Hoddle, Big Hole and Cheitmore

Hoddle was appointed on 1/4/29. Accompanied by Edward Knapp, he surveyed the country from Bulli and Bargo to Moruya, entirely east of the dividing range. His journals suggest that he probably passed within one kilometre of the Big Hole in 1827 (Andrews 1992) but he didn't record it. Mitchell became aware of the Big Hole some five years later, visiting it and Cheitmore Caves accompanied by a Mr Ryrie:

"In a hasty ride which I took as far as Carwary (i.e. Krawaree), in 1832, I was conducted by my friend, Mr Ryrie, to a remarkable cavern under white marble.
… But still further southward, and on the range separating the country at the head of the Shoalhaven River, from the ravines on the coast, I was shown an 'antre vast', which, for aught I know, may involve in its recesses, more of the wild and wonderful, than any of the 'deserts idle' which I have since explored. A part of the surface of that elevated country had subsided, carrying trees along with it, to the depth of about 400 yards, and left a yawning opening about 300 yards wide, resembling a gigantic quarry, at the bottom of which the sunken trees continue to grow. In the eastern side of the bottom of this subsidence, a large opening extended under the rock, and seemed to lead to a subterraneous cavity of great dimensions."

John Rogers

By the end of June 1830, John Rogers had for more than a year been assiduously surveying the Goulburn River. He accomplished all that Mitchell had asked for there and was ready for more. Indeed, there was more to do there, but instead of being required to continue that work he was sent to Bathurst, there reporting personally to Mitchell. On 24 July 1830 he was despatched from Bathurst with explicit instructions:

"…3rd - The Duty on which you will immediately commence on arriving at Molong will be as follows viz – To trace the Molong River down to its junction with the Bell and the same River (Bell) to its junction with the McQuarie below Wellington Valley … to trace the River McQuarie from the junction of the Bell upwards to the junction of the Cudgegong …(Mitchell to Rogers, 24/7/1830, 4/6909, AONSW)
….
"8 …*You will also note particularly where limestone occurs in all your Survey and this you will tint on your Map by a grey made by mixing blue and red together shewing something like the extent of the limestone rock"* (ref 487 in Major Mitchell's map) (Mitchell to Rogers, 24/7/1830, 4/6909, AONSW)

This was only a few weeks after Mitchell's personal investigations of the Wellington bone deposits. It appears very likely that both the brief to Rogers and its timing were motivated strongly by a desire to locate more cave bone sites – Mitchell was in full control of the timing and deployment of his staff and this particular region could have waited. Certainly, as we shall see, Mitchell asked him to follow up some speleological enquiries.

Delayed by the loss of a packhorse, on August 7 Rogers marked his first limestone along Molong Creek and another along the Wellington Road. Others followed on the 17th, 18th and 20th. By Thursday August 26th he located the Bakers Swamp limestone and on 2nd September two more outcrops along Burrandong Creek, and again on September 3, 6, 7, twice on the 14th, then on the 18th. On the 20th he reached the Burrandong Road, marking *"Limestone "* and *"Caves"* and on the 21st he reached Wellington Valley. Apart from the known caves, more limestone was again recorded near the Soldiers New Barracks at Wellington on September 23.

On Thursday 9 September Rogers had written: *"Plotting – Sent two Men to dig for Bones at the Caves near Wellington Valley NB informed that there are other and more extensive caves in the neighbourhood of Canobolas not yet visited by persons collecting therefrom."* On the 28th Rogers himself made the trip: *"Paid a visit to the Caves today instead of Sunday"*, and in his monthly report for September reported that:

"Having understood that you wish to know the native name of the caves, I have ascertained those near Boree to be called Mulwang, those near Wellington seem to be sounded Welbang, and others there are above the junction of the Cudgegong called Werran-dang.

The natural troughs which I understood were empty when you visited the caves are now full of Water proceeding apparently from the concreted mass above".
Rogers to Mitchell 30Sep 30 2/1574)

Just which are these *"other and more extensive caves in the neighbourhood of Canobolas not yet visited by persons collecting therefrom"?* Although they are not in fact more extensive than Wellington, this could only refer to Boree Caves, a surmise supported by the fact that although this area was not in his original brief, Rogers went there on 30th November and again on 25th and 26th December.

Mitchell's journals record that he reached Wellington *"by way of Buree and Molong"* in 1830, implying that his visit to Boree Caves preceded that to Wellington, and he did later describe bone breccia both there and in a small cavity at Molong. If this were the sequence of events, one would not expect either John Rogers' field note on 9th September, nor why he was despatched to Boree in both November and December. It seems more likely that Boree at least was not visited by Mitchell until well after the time of Henderson, and then only briefly, as he himself records in his diary for 17th March, 1836.

In summary, Rogers located and mapped limestone at Molong, Cumnock, Bakers Swamp, Nubrigyn Creek, Burran Burran, Dripstone, Boduldura, possibly Stuart Town and Finchs Cave, and sites along the Macquarie and Cudgegong Rivers. Some of the last in particular are now submerged beneath Burrendong Dam. It may have been he who told Mitchell about Boree: if so, Mitchell's investigations there must certainly have been somewhat later than Henderson's.

Why not Jenolan? - William Romaine Govett and Henry Faucourt White

After more than three years large blanks remained on the map in County Westmorland. Govett was charged with the portion east and south of Oberon. Approaching from the east on one expedition, he traced the course of Coxs River, noting several tributaries from the west, and marking and naming Mt Jenolan and Mt Colong. West of the Dividing Range his brief was to survey the Fish River to its source south of Oberon, and the route from the west to the headwaters of Jenolan River. Why, then, did he not proceed over the gap and down the gently sloping valley leading to the caves?

Mitchell's instructions were

3rd – You will commence the trace of the Fish River at the place where the road from Sydney first crosses it keeping either bank upwards as you find convenient. It will be desirable to extend the survey of the main range also, so as to carry both on together, which, from the apparent parallelism I observed, you will be able to do for some distance. When one must be abandoned, you will keep the range, and trace it Southward as the ground will permit.

5th – As the heads of the rivers on the interior side may be of easy access – I have to request your attention also to the survey of any such which you may discover in order that they may be connected with the survey of the Abercrombie, Colborne and Campbell rivers, now in progress, and on which I intend soon to dispatch another officer.

6th – I am aware that this will be a difficult operation, but it is one of the most important surveys still required to complete the map of the Colony – and I rely on your ability and experience for the performance thereof. (Mitchell to Govett, 21 Nov 1831, 4/6910, AONSW)

In the process, Govett lost a Pack Horse and his own horse, reporting that:

I beg to inform you that as soon as I have completed the River to its sources, I shall make it a point to find the two horses lost, without which I cannot proceed on Survey to the Collong Mountain …"
(Govett to Mitchell, 31 Jan 1832, 2/1541 AONSW

So, it appears that Mitchell's instructions and Govett's time lost in relocating the horses caused him to press south to the source of the Fish River and beyond, rather than descend the gently sloping valley which leads to Jenolan Caves. In this area, therefore, Mitchells' map shows the course of all tributaries flowing west or north to the Fish River from the Dividing Range, but no east-flowing streams.

To further explore this conspicuous blank, Mitchell directed the attention of Henry Faucourt White:

"… you will proceed without further delay, to Burragorang and commence a survey of the country beyond the Wollondilly. Mr Govett having left an extensive portion of Country quite unexplored between the dividing range and that river - With this view … you will next trace a connection upwards from Collong to Murrum (sic) and Werong … and you will ascertain during that trace where the high range extends from it Northwards towards the lofty fixed point – shewn

in the tracing to accompany this letter, that range you will also trace to its northern extremities which overlook Coxs River near three remarkable conic shaped hills.
(Mitchell to H F White 2/1/33,2/1592 AONSW)

" … By following the extremities overlooking Cox's River, it is hoped that you will thus determine enough of the general course of that part of the river which it has been found impossible to approach on the other bank, and of which the Survey is very much required". (Mitchell to H F White, 2/1/33, 4/4524 AONSW)

White traced some 34 miles of ridges from Colong, and on his return wrote

"I have traced with greatest difficulty, the range from Collong (Mt Colong) to Mr Govett's dividing range … In tracing the above range the obstacles I have met with have been very great – the ranges being formed of immense masses of unconnected rock – many surrounded by a perpendicular wall or cliff which makes them inaccessible. … I found it impracticable to get my Pack-bullocks further than Colong … That part of the ranges which is not so inaccessible is covered with a scrub, so thick, that had it not been for our Setting it on fire, I have no hesitation in saying that to have it surveyed through it would have been impossible.
(White to Mitchell,27 Feb 1833, 2/1592 AONSW)

William Govett was then despatched once again, this time further to the north:

"The native name of the highest ground shown in my Sketch is to be obtained if possible – Jenolan is that of a hill some miles higher on the Cox – and was obtained by Mr White "
(Mitchell to Govett, 4 Sept. 1833, 4/5424 AONSW).

This was Govett's last assignment and it was horrendously rough country. He did not add much to the west of the Cox River and Mt Jenolan. Mt Jenolan appears on Mitchell's map but the Jenolan River is not named and only 3 miles of its course is sketched. Following the Jenolan River upstream from Coxs River would be a major undertaking, almost certainly blocked at Hells Gate in Hellsgate Canyon, about 3 miles below the Caves. However another map published in the same year (Mansfield 1834) does mark 'Jenolan C' (meaning creek, not caves).

The difficulties of surveying in this rugged country and the practice of following ridges to retain intervisibility meant that on Mitchell's final map, much of the large blank remained on the map of County Westmorland including the area near and south of Jenolan Caves. It was at least another six years before the Whalans descended the ridges and valleys of the Jenolan River and located the caves. Henry Faucourt White's traverse in 1833 from Mt Colong north-east to the Coxs River passed within 2.5km of Colong, Church Creek and Billys Creek Caves and similar distances from Jaunter and Tuglow, but for the same reason, they remained hidden and were not recorded until much later in the nineteenth century.

Abercrombie Caves

As noted above, the Sydney Gazette dated 6 October 1821 referred to a *"cave of considerable dimensions … in the neighbourhood of Bathurst"* leading some writers (e.g. Havard, 1934; Keck and Cubitt, 1991) to conclude that it referred to Abercrombie Caves. This is not impossible; certainly Keck and Cubitt assembled strong evidence of the early settlement of the district to the north. However Abercrombie is some way beyond settled land, well south of the road from Sydney, and scarcely *"in the neighbourhood"* of Bathurst, which is 73km north and had been established only 6 years earlier. The only recorded contemporary exploration in the district had been Evans' journey 40km to the north-west in 1815, and Throsby's in 1819, equally distant to the east (Cambage, 1921).

Thus, as evidenced earlier, Limekilns is a rather more likely source for the Gazette's story. According to Geoff Bates (1982), early rumours of a cave system near the Abercrombie River first appeared around 1825, but no source is given either for this statement or another, that at that time early settlers and stockmen referred to a place called "The Bridge", an early name for the Abercrombie Caves. It may well be that the first white visitors were bushrangers, and both Bates and Keck & Cubitt compiled comprehensive accounts of that era. Had the caves been widely known earlier than 1830, it seems likely that Thomas Mitchell would have found an excuse for inspecting them. By 1834 the first tourist party had arrived and Abercrombie was visited by several travellers during the following years.

The Missionaries at Wellington Valley

> *"Behind them were the conquered hills; they faced*
> *The vast green West, with glad strange beauty graced;*
> *And every tone of every cave and tree*
> *Was a voice of splendid prophecy"*
>
> (Kendall, quoted in anon 1924)

We have seen that the Wellington Valley was first recorded by John Oxley, and that he crossed the Bell River to the present site of Wellington Caves, noting high quality limestone as being quite common.

A military outpost was established at Wellington in 1823 for the control of bushrangers and from then until the late 1830s the valley was at the very frontier of white settlement in New South Wales. Although the first authenticated reference is a letter written by Hamilton Hume on 4 December, 1828, the caves were known before then. A long-time inhabitant of the area, Robert Porter later wrote a book claiming that a convict named John Saville had first been shown the caves by aborigines in 1823. Though not implausible, this story has never been authenticated and the book has elements of legendary folklore. However the caves were certainly known by 1826, when the painter and traveller Augustus Earle produced a series of interiors and exteriors (Hackforth-Jones, 1980; Hamilton-Smith, 1997).

In 1830 the Church Missionary Society in London determined to establish a mission in New South Wales, at the frontiers of white settlement. They chose Johann Handt, a Swiss Lutheran who had seen service in Sierra Leone and Liberia, and he arrived in Sydney on 26 June 1831. Plans became mired in bureaucracy for 14 months, for the government seemed in no hurry to honour its promise to finance the venture. Handt used the time to find a wife, was married by Samuel Marsden on 4 July 1832, and eventually left Sydney on 18 August with supplies to establish the mission, taking 46 days to reach Wellington Valley. Over the years he kept a meticulous diary from which we know he toured Wellington Caves on 19/11/1832, 10/7/1833 and 24/9/1835, hosting respectively a Mr Fisher, Mr Betts (son-in-law of Samuel Marsden), and James Backhouse and George Walker (see Appendix 3). The head of the mission, William Watson also diarised a visit on 6/11/1838 when he hosted the Rev. J. Taylor who stayed four days *"to examine the state of the Mission"*.

Marsden's interest in the Wellington experiment arose possibly because he had many years earlier adopted aboriginal children and had assisted in the establishment of missions throughout the region. He may have harboured other motives, perceiving as he did a link between missionary activity and trade. It is not clear whether he ever visited the caves. James Backhouse had been despatched , among other things, to establish branches of the Society of Friends (Quakers), and he travelled extensively throughout eastern and southern Australia. In Tasmania Backhouse supported the racist, possibly genocidal activities of George Robinson who believed Aborigines would respond to Christianity only after they had been stripped of their land and culture. In their lack of compassion, his writings are curiously similar to those of the Wellington

missionaries. In comprehensive diaries he described cave visits at Mole Creek, Norfolk Island and Wellington. Of the page devoted to the last he said: *"Some bones are said to have been found in this cave, but I saw none, neither did I perceive any traces of fossil remains in the limestone."*

Taylor, Marsden and Backhouse were all energetic, educated, influential observers, but the Wellington missionaries reveal no suggestion that they harboured any curiosity or intellectual interest in the caves. They apparently visited the caves only as a break in routine, and then only as a courtesy to visitors (see Appendix 3). In keeping with other diary entries, their cave descriptions are impersonal, even terse in places. They do not reveal whether either the missionaries or indeed the more widely travelled and educated Backhouse even appreciated the wider interest in the scientific contents of the caves. Nowhere is there mention of Thomas Mitchell, for example, even though the period in question followed closely on his visits. If they did know of Mitchell, they may well have eschewed his interpretation, as it cast doubt on biblical tradition. Taylor's notes (Taylor 1836, quoted in Osborne 1991) include several pages describing caves and their bones, but Watson's diary says no more than that *"We found a few bones which we supposed were those of a Kangaroo"*.

Dominated as they are by a single-minded, evangelistic and curiously impassive devotion to the task of saving souls, the other diary entries reveal minds not open to recreational or enquiring diversions from the task at hand. Indeed, overall, the diaries say little about life beyond the day to day drudgery, Watson lamenting that *"It is impossible for our friends who are surrounded with all the comforts and polite appendages of civilised society can form anything like an adequate idea of the drudgery and attendant on this mission"*

The Mission faltered and eventually failed in the early 1840s. It could hardly prove viable when official policy condoned extermination and Aboriginal survivors still had access to traditional and other food sources. By then, as it happens, barely 50 or 60 of the original Tasmanians described by Backhouse were still alive.

On all four occasions the cave tours were made on the occasion of guests arriving from Sydney and elsewhere. We may suppose that 160 years ago, just as today, a visit from friends and acquaintances provided the opportunity for a break in routine and perhaps a picnic.

Van Diemens Land, Victoria and Norfolk Island

Van Diemens Land colony was separated from New South Wales in 1825, and as in New South Wales, surveyors were among the first to record limestone and caves. As early as 1827 Henry Hellyer described and sketched Rocky Cape North Cave, a raised sea cave 80 feet long and up to 10 feet high in Precambrian quartzite on Rocky Cape (Middleton, 1990). This site had long been utilised by Aborigines, and was excavated as early as 1912.

Although, as noted above, John Henderson's pioneering establishment of the Van Diemens Land Scientific Society failed, the focus of 'science' did move for a period to the island colony. Governor Arthur was no champion of science despite his patronage of the Society, but his successor Sir John Franklin was more sympathetic, fostering a new Natural History Society in 1839 and even a scientific journal. The emphasis remained on natural history and there was no parallel interest in caves, but both Governors visited caves at Mole Creek during their incumbency, establishing a precedent for vice-regal visits which became a pattern in other states.

Probably the earliest documented reference to caves is that by Thomas Scott who recorded that in 1829 Governor Arthur visited a limestone cave at Circular Marsh, most probably Wet Cave.

The peripatetic James Backhouse toured the colony extensively in 1833:

Passing over a few more hills, we came to some small limestone plains, called the Circular Pond marshes, from a number of circular basons (sic), that seem to have formed by the draining off of the waters, with which the whole are sometimes covered, into subterraneous channels. Some of these ponds are full of water, the outlets below being choked with mud, others are empty, and grassy to the perforated bottoms. There are also some cavernous places. We fixed our quarters for the night under the shelter of a wood, and by the side of a place resembling the bed of a deep river, that commenced and terminated abruptly: the water, which at some seasons flows through it, evidently finds ingress and egress through a bed of loose gravel. …

26th. We explored a few of the caverns, the entrances of some of which resemble doorways, and open into a grassy hollow. At the end of a long subteraneous passage, into which I descended with a torch of butning bark, there was fine, clear stream of water, three feet wide and equally deep, emerging from one rock and passing away under another. The limestone was of a bluish colour, imbedding iron pyrites – between the Circular-pond Marshes and the Moleside Marshes, some elevated land occurs. The latter takes its name from the Moleside River, which also becomes subterraneous in some places.

Backhouse also visited caves at Wellington (NSW), as noted above, and on Norfolk Island. Of the latter he wrote of a visit on 4 June, 1835: *"We went to see a singular little cave, not far from the Commandant's house. In this place, two men who absconded, a few months since, concealed themselves in the day-time, and for a considerable period, eluded detection. The cave is in rugged limestone, that forms two low hills, the flat, and the reef on the south of the Island … The cave was near to a lime-kiln, and was concealed by a stone, drawn over its mouth".*

We have already seen that Thomas Mitchell noted the limestone at Glenelg River is western Victoria in 1836. Following routes south from the Monaro Plains, settlers probably reached Buchan, Victoria by 1838 (Daley, 1960) but records of the period are scanty.

Conclusion

From the time of the first white settlers, it had taken 25 years to cross the Blue Mountains and a little longer to find limestone. The next 25 years, from 1813 to 1838 was the first great period in Australian speleological discovery. Most of the significant karst areas now known in New South Wales were located and in some cases explored for caves. Elsewhere, as in Tasmania, the occasional traveller described a cave visit, but after the Wellington bone saga there was no scientific interest in caves or their contents for many years. At the close of Australia's first half-century, settlement had only just commenced in what is now Victoria, Queensland, South and Western Australia.

In Australia as elsewhere we remember the original explorers, and indeed a few were the first recorders of limestone. But we should also celebrate the achievements of the assiduous Assistant Surveyors. In most cases they too were the first whites, travelling under difficult conditions in country so rugged that it remained untouched for another century or longer. The contributions of John Rogers in particular deserve greater recognition, while the enigmatic John Henderson was a pioneering writer on cave science.

References

Abbreviations: JRAHS = Journal of the Royal Australian Historical Society
AONSW = Archives Office of New South Wales

Andrews, A.E.J. (1986): *Stapylton: With Major Mitchell's Australia Felix Expedition, 1836*, Hobart:Blubber Press, 297pp.

Andrews, A.E.J. (1991): *Kosciusko: the mountain in history*, O'Connor, ACT: Tabletop Press

Andrews, A E J (1992a): *Major Mitchell's Map 1834: The Saga of the Survey of the Nineteen Counties*, Hobart: Blubber Press, 402pp.

Andrews, A.E.J. (1992b): Barrallier and Caley: The Evidence of their Burragorang Maps 1802-1806. *JRAHS 82 (1)*: 60-72.

Andrews, A.E.J. (1998): *Earliest Monaro and Burragorang 1790 to 1840,* Canberra: Tabletop Press, 208pp.

Anon. (1838): *A Month in the Bush of Australia: Journal of one of a Party of Gentlemen who recently travelled from Sydney to Port Phillip, with Some Remarks on the Present State of the Farming Establishments and Society in the Settled Parts of the Argyle County*, London: J. Cross, 54pp.

Anon. (1924): *Official Souvenir: Back to Wellington, Sep. 22-27, 1924*, Sydney: National Publicity Co.

Backhouse, J. (1843): *Narrative of a Visit to the Australian Colonies,* London: Hamilton Adams,

Barrallier, F.(1802): Barrallier's Journal *HRANSW Pt 5,*

Bates, G. (1982): *Abercrombie Caves*, Waramanga, ACT: the author.

Battye, B. (1984): Church Creek Caves. *Anthodite 2:* 2-7.

Beaver, P. (1952): The Map of the Nineteen Counties and the early trigonometrical surveys of N.S.W. *Australian Surveyor,* Sep/Dec 1952

Bennett, George (1834): *Wanderings in New South Wales, Batavia, Pedir Coast, Singapore, and China, being the journal of a naturalist in those countries, during 1832, 1833 and 1834.* London: Richard Bentley, 2 vols, 441pp. Facs. Ed., 1967, Adelaide: Libraries Board of South Australia.

Bland, W. (ed.) (1831): *Journey of discovery to Port Phillip, New South Wales by Messrs W.H.Hovell and Hamilton Hume in 1824 and 1825.* 2nd edition, 1837, Sydney: James Tegg

Brownscombe, R. (1992): Barrallier's Blue Mountains Exploration in 1802. Clearing the Matter Up, Finally? *JRAHS 78 (1-2)*: 5-16

Buckland, W. (1824): *Reliquiae Diluvianae, or Observations on Organic Remains and on Other Geological Phenomena Attesting to the Action of a Universal Deluge,* London: John Murray.

Cambage, R.H. (1910): Barrallier's Blue Mountains exploration in 1802. *JRAHS 3 (1):* 11-25

Cambage, R.H. (1921): Exploration between the Wingecaribee, Shoalhaven, Macquarie and Murrumbidgee Rivers. *JRAHS 7(5)*: 217-288

Carey, H.M. & Roberts, D.A. (eds.) (with original design by Peter Davey) (1995): *The Wellington Valley Project. Letters and Journals relating to the Church Missionary Society Mission to Wellington Valley, NSW, 1830 - 45. A Critical Electronic Edition.* 1995.

Collins, D. (1802): *An Account of the English Colony in New South Wales from its first settlement in January 1788 TO August 1801…* London: T Cadell, 335pp.

Crabb, E. (1998): History of Cave Exploration at Bungonia (pp. 41-50 in) *Under Bungonia* (Bauer, J. & P. eds.), Oak Flats NSW: Life on Paper.

Cunningham, A. (1825): Journal of a Route from Bathurst to Liverpool Plains, in Field (1825), pp. 131-192

Currie, M.J. (1825a): Journal of an excursion to the southward of Lake George in New South Wales (in) Field, B.

Currie, M.J. (1825b): *A map of the country to the south of Lake George shewing Captain Currie's and Major Ovens's route during the months of May and June 1823 …* London: John Murray

Daley, C (1960): *The Story of Gippsland*, Melbourne: Whitcombe & Tombs

Dunkley, J.R. (1996): Maps of Australian Caves and Karst. *The Globe 44:* 41-44 (republished in slightly amended form in this volume)

Dunkley, J.R. (in prep.): *John Henderson, Thomas Mitchell and the first publications on cave science in Australia.*

Else-Mitchell, R. (1938): Barrallier's Blue Mountains Explorations, 1802. *JRAHS 24 (4): 291-313*

Evans, G.W. (1815): The Journal of Assistant Surveyor Evans to His Excellency Governor Macquarie etc. etc. etc. (reproduced in) *HRA pp. 611-619.*

Field, Barron (1825): *Geographical Memoirs on New South Wales by various hands … together with other papers ….* London: John Murray

Foster, W. (1936): Colonel Sir Thomas Mitchell D.C.L. and Fossil Mammalian Research. *JRAHS 22 (6):* 433-443

Hackforth-Jones, P. (1980): *Augustus Earle, Travel Artist*, Canberra: National Library of Australia

Hamilton-Smith, E. (1997): Nineteenth Century Paintings, Drawings and Engravings of Australian Caves. *Helictite 35 (1-2)*: 12 - 38

Havar, W. (1934): The Romance of Jenolan Caves. *JRAHS 20 Pt 1*: 18 - 65

Henderson, J. (1832): *Observations on the Colonies of New South Wales and Van Diemens Land*. Calcutta, Baptist Mission Press,

Hunter, J. (1793): *An historical account of the transactions at Port Jackson and Norfolk Island ….* London: John Stockdale, 584pp.

Jennings, J.N. (1979): Man and other animals in Australian caves and shelters: A review. *Trans BCRA 6* (3): 93-130

Jervis, J. (1954): William Lawson, explorer and pioneer. *JRAHS 40 (2)*: 65-93

Johnson, R. (2001): *The Search for the Inland Sea: John Oxley, Explorer, 1783-1828*, Melbourne: Melbourne University Press.

Kabaila, P R (1998): *Wiradjuri places: the Macquarie River Basin and some places revisited*. Canberra: Black Mountain Projects, 112pp.

Keck, K. and Cubitt, B. (1991): *Abercrombie Caves Cave Chronicles: A New Look at an Old Wonder*. Abercrombie Caves: the authors.

Lane, E.A. (1975): Lime, Limestone and the First Caves. *Austr. Nat. Hist. 18* (6): 190-195 (reprinted with permission in *Austr. Caver 110*: 5-9, 1986)

Lesson, R. P. (1828) *Observations generales D'Histoire Naturelle – faites pendant un voyage dan les montagnes-bleues de la nouvelles-galles du sud*. Annales des Sciences Naturelles, Paris, Chez Crossard (also published in) Voyage Medical autour du Monde, execute sur la corvette du roi La Coquille commandee par M.L.I. Duperrey pendant les annees 1822, 1823, 1824 et 1825. Paris, Roret, 243pp., 1829.

Macquarie, Gov. L.(1815): Letter to Earl Bathurst, 30 June, 1815. *HRA: 608*

Macqueen, A (1993): *Blue Mountains to Bridgetown: the life and journeys of Barrallier 1773-1853.* Springwood: A. Macqueen, 160pp.

(Mansfield, R.) (1833/34): (in) *New South Wales Magazine*, in 2 vols, parts 1 – 5 and 6 - 8

Middleton, G. (1990): Rocky Cape North Cave – an early cave map from Tasmania. *Jnl. Sydney Speleol. Soc. 34* (11): 213-216

Mitchell, T.L. (1831): Further Notice in Regard to the Fossil Bones Found in Wellington County, N.S.W. *Edin.New Phil. J. XXIII*: 179-180

Mitchell, T.L. (1834a): An Account of the Limestone Caves at Wellington Valley, and of the situation, near one of them, where fossil bones have been found. *Proc. Geol. Soc. Lond 1*: 321-322 (paper dated 14 October, 1830, read 13 April, 1831)

Mitchell, T.L. (1834b): *Map of the Colony of New South Wales*. Compiled from actual measurements with chain and circumferentor, and according to a Trigonometrical Survey. Engraved by John Carmichael, London

Mitchell, T.L. (1838): *Three expeditions into the interior of Eastern Australia; with descriptions of the recently explored region of Australia Felix, and the present colony of New South Wales,* London: T & W Boone, 2 vols.

Mudie, R. (1829): *The Picture of Australia exhibiting New Holland, Van Diemens Land, and all the Settlements, from the First at Sydney to the last at Swan River*, London: Whittaker, Treacher

Mulvaney, D.J. & Kaminga, J. (1999): *The Prehistory of Australia*, Sydney: Allen & Unwin

Officer, An (pseud.) (1789): *An Authentic Journal of the Expedition under Commodore Phillips to Botany Bay, with an Account of the Settlement at Port Jackson and a Description of the Inhabitants etc.*, London: C. Forster

Osborne, R.A.L. (1991): Red Earth and Bones: The history of cave Sediment Studies in New South Wales, Australia. *Earth Sciences History* 10 (1): 13-28.

Oxley, J. (1820): *Journal of Two Expeditions into the Interior of Australia, 1817-1818,* London: John Murray.

Pickering, K. (1973): Lieutenant William Lawson – Australia's First Speleologist. *Oolite 5 (3)*: 1-7

Potter, L (1940): Cavan. *JRAHS 26* (2): 188-196

Porter, R. Eumalga, or the White Chief

Shaw, T.R. (1997): Robert Townson, Traveller in Hungary in 1793 – His Life and Work. *Acta Carsological 26 (2)*: 225-247

Sturt, C. (1833): *Two Expeditions into the Interior of Southern Australia during the Years 1828, 1830 and*

1831; with observations on the soil, climate, and general resources of the colony of New South Wales, London: Smith, Elder & Co., 2 vols.

Taylor, R. (1836): Diary, typescript, Alexander Turnbull Library, Wellington, New Zealand, unpubl. (quoted in Osborne, 1991)

Tench, W. (1793): *A Complete Record of the Settlement of Port Jackson*, London: Nicoll and Sewell

Townson, R. (1797): *Travels in Hungary, with a short account of Vienna in the year 1793*, London: R.G. & J.Robinson

Weatherburn, G. (1966): *George William Evans, explorer*, Sydney: Angus and Robertson.

APPENDIX 1

(from)

Mudie, R. (1829): *The Picture of Australia exhibiting New Holland, Van Diemens Land, and all the Settlements, from the First at Sydney to the last at Swan River*, London: Whittaker, Treacher

"Of limestone, near Sydney, there is none, and none has yet been discovered so near as would pay for the long land carriage. There is, however, a substitute, which answers for architectural purposes, in the vast heaps of shells that are found on the shores of some of the inlets. These shells are found in great quantities: and it need hardly be added, that when they are burnt they make a very pure lime. On approaching the mountains southward, mountain limestone makes its appearance. It is found in beds of great thickness, of a greyish colour, and in some instances so compact, that it may pass for an inferior species of marble. The limestone strata occur again, on the west side of the mountains, at Bathurst, and they are found also in the elevated plain near the sources of Hunter's river. In both of these places the lime occurs in the common form of limestone, or carbonate, and also in that of plaster-stone, or gypsum; but both are at too great a distance from the coast for being of any great value, except in the neighbourhoods where they are found. Calcareous rocks have been seen on so many parts of the coast, that it is by no means improbable that there is a great deal of limestone in the central parts of the country."

APPENDIX 2

Visit to Caves at Cavan (Wee Jasper), 26 April, 1837

(from)

Anon. (1838): *A Month in the Bush of Australia: Journal of one of a Party of Gentlemen who recently travelled from Sydney to Port Phillip, with Some Remarks on the Present State of the Farming Establishments and Society in the Settled Parts of the Argyle County*, London: J. Cross, 54pp.

(Tuesday, 25th April) We had intended going this afternoon as far as Cavan, the estate of late Mr E.W. Riley, and to visit the wonderful caves on the Murrimbidgee *(sic)* and return here to dinner, but have abandoned these intentions until tomorrow, when we are promised the company of the ladies. …

C. O'Brien's, Yass, Wednesday forenoon , 26th April – Here we are, detained, I am sorry to say, by the annoying circumstance of the loss of horses … It was not until eleven o'clock that we ready to start. Just then arrived Mr McAlister, and with him Mr McFarlane and Mr G, Stewart, police magistrate, from Goulburn, which delayed us some time. The ladies in a cart, with tents, beds and bedding, provisions &c and the five gentlemen on horseback. We arrived at Cavan at half-past four, intending to proceed at once to the mouth of the cave, and there to encamp all night, having been told that they were distant only four miles from Cavan, but we now ascertained they were seven or eight miles off, and that it was impossible we could arrive there before dark, we therefore determined to remain at Cavan all night. When we had dined, the gentlemen walked out to examine the improvements, &c about Cavan; these are not very extensive.

…We spread our beds on the floors, &c at Cavan, and I slept soundly until near daylight yesterday. I was the first of the party to awake and get up, and having dressed, and seen the horses fed with such food as we could get, got the whole party afoot, and by seven o'clock we were on our way to the cave, which we did not reach until past ten. We then lighted a fire, had breakfast on the ground, for which we had all abundant appetite, an afterwards we proceeded to examine the caves. The entrance is a narrow fissure, a little way up the side of a hill, rising out of a deep valley, and is so covered by rocks that no one would be led to suppose there was any opening; the cave soon opens however, and for some space its floor slopes inwardly, and a few dozen yards brings us to a spacious and lofty chamber; the walls and roof are of uneven surface, and presenting fantastic shapes and appearances, but there are here few stalactites. Its further extremities seem closed by rocks of limestone, encrusted by the substance, once liquid, but now hardened, which constitutes petrifications. Over and through amongst these, a very rugged, and, especially for ladies, a very difficult path, we scrambled for some considerable distance. Sometimes we had to go through very small apertures on hands and knees, at other times had to surmount high rocks. Sometimes the caves opened out into spacious apartments, wide and lofty, at other times they were narrow and low. Here and there we met with stalactites and with pools of water. The most beautiful specimen of the former is called Ebden's altar, and is really very pretty. A mass of crystalized, though opaque, stalactites, in colour and appearance somewhat resembling alabaster, hangs over a mound of the same material, and is altogether a very picturesque object. We did not explore, I should think, one-half of the various caves or branches, nor do I suppose that one-half of them are yet discovered, as it is most probable that a great part of the hill is perforated, but we saw enough to give us, I should think, an idea of the whole, and the caves are certainly worth visiting; they are not, however, as far as yet discovered, so fine as many cavities of the same nature, to be seen in other parts of the world, and are thought more wonderful by the native colonists, than they would be by travellers accustomed to inspect extraordinary works of nature and art. These do not appear to contain any breccia or other organic remains, as do the caves at Wellington. From the caves we proceeded homewards to Yass, stopping at Cavan to refresh, and it was nearly eight o'clock 'ere we reached this, having travelled at least thirty miles during the day.

(from)

Appendix 3

The Missionaries at Wellington Valley
(from)
Hilary M. Carey and David A. Roberts (eds.) (with original design by Peter Davey) (1995): *The Wellington Valley Project. Letters and Journals relating to the Church Missionary Society Mission to Wellington Valley, NSW, 1830 - 45. A Critical Electronic Edition.* 1995.

Monday, 19, November (1832) (Handt)

"We and our visitors took a ride to Mr Fisher's this morning, and the latter being desirous of seeing more of the country, we went afterwards to a subterraneous cave, 3 miles from Wellington. This cave is on a plain, in rocky ground. The nearest mountain is about a mile from it. Its entrance is insignificant and descent steep. The height inside is about 40 feet in some places and the width twice as much. In length it is about the same as Salisbury Square in London. In the middle of the cave there is a formation of rocks resembling an altar with a pulpit. Close to this formation, at the left side, the lofty rocks seem to be of a crystalline substance, and as their outside form was like icicles, they resembled much a large organ with various tubes. The rocks were in many places of a crystal appearance. We went as far as we could, and where we could not walk, we crept along, as at steep places we were obliged to do several times, till we came to an abyss, which at it proved by throwing down stones, was filled with water. When we came up, I found that my hat, which I had left outside, was burned to cinders, as Mrs Watson's bonnet and veil, and some other little articles. We had made a small fire outside the cave, before we entered it, in order to kindle the torches which we would take with us, but, during the time we had been in, the fire had rapidly spread towards our things; and had we not appeared just at the moment we did, would have destroyed all we had left outside."

Wednesday, 10 July 1833 (Handt)

"There are more Blacks here than usual. Some of them were curious to see our little boy. Mr Betts from Parramatta, Son in law to the Rev. S. Marsden, paid us a visit today. Went with him to the cave, where we found the air, being winter here at present, very warm. Besides the curiosities mentioned under date the 19th of Nov. 1832, we discovered many bats sticking to the rocks, which had taken their shelter in the cave from the cold."

Thursday, 24 (September, 1835) (Handt)

"Took a walk to the Cave with James Backhouse and George Walker, our visitors. Met with several Blacks, and talked to them: fell in also with one of the Boys, who went away on the 21st instant, and brought him back. The old sick woman, mentioned under date the 8th, was worse this evening. Mr Backhouse prepared her some medicine, which, being sweetened, she took without reluctance. She is more susceptible, when spoken to about spiritual things, than I found many of the men."

(November) 6. (1838) (Watson)

"Rev. R. Taylor wishing to see the Caves at the end of the valley, we formed a little party for that purpose. We descended to a considerable depth, assisted by ropes and torches. The stalactites we saw are very large and beautiful. We found a few bones which we supposed were those of a Kangaroo. We were prevented proceeding so far as we wished for the want of more torches."

Appendix 4: EARLY ACCOUNTS OF LIMESTONE AND CAVES IN NEW SOUTH WALES – A summary

AREA	Lime-stone	cave	Earliest records
Abercrombie	1820s		See text for discussion
Apple Tree Flat	1823		(now known as Queens Pinch) Cunningham
Bakers Swamp	1830		Rogers
Big Hole		1832	Mitchell, Ryrie
Boduldura	1830		Rogers
Borenore	1830	1830	Henderson (probably known earlier), Rogers
Bowan Park	1830		Rogers
Bungonia	1822	1824	Harper, Cunningham, many other contemporary reports
Burran Burran	1830		Rogers
Burran Burran	1830		Rogers
Cave Flat	1824	1824	Hovell & Hume, Bennett, see also Wee Jasper, Taemas
Cheitmore		1832	Mitchell & Ryrie
Church Creek			Sometimes incorrectly attributed to Barrallier
Cliefden	1815		Evans
Colong	1893	1896	Scrivener (?) according to Battye
Cooleman Plain	1829	1875	Stapylton (underground streams), Gale (known earlier)
Crawney Pass	1852		Clarke, but possibly
Cudgegong	1830		Rogers, Cunningham (?)
Cumnock	1830		Rogers
Dripstone	1830		Rogers
Finchs	1830?		Probably Rogers
Geurie	1830		Rogers (?)
Jenolan	1838?	1838?	?According to tradition by C & J Whalan
Jerrara	1818?	1832?	Throsby & Meehan; Bennett
Limekilns	1821	1821	Lawson, probably first recorded limestone cave
Limestone Plains	1823		Currie
London Bridge	1823	1823	Currie, possibly second recorded limestone cave
Michelago	1823		Currie
Molong	1830		Rogers (possibly earlier)
Mt Fairy			no record, probably known in early days of settlement
Nubrigyn Creek	1830		Rogers
Queens Pinch			See Apple Tree Flat
Rosebrook	1823?		Probably Currie
Stuart Town	1830		Probably Rogers
Taemas/Narrangullen	1824	1829	Hume, Stapylton, Bennett
Timor	1820s?		Referred to in Mudie 1829
Tuglow		1884	H & C Wilcox according to Trickett in 1897
Walli	1815		Evans
Warroo	1820s		See Wee Jasper & Taemas / Narrangullen
Wee Jasper	1824	1829	Hume, Stapylton, Bennett, anon.
Wellington	1818	1826?	Oxley, see text for discussion
Wombeyan	1828	1828	Oxley
Yarrangobilly		1834?	
Van Diemens Land:			
Circular ponds	(1833)	1829	(Backhouse), Scott, but probably known earlier
Chudleigh		1833	Backhouse, but known earlier
Norfolk Island		1835	Backhouse, but almost certainly known much earlier
Victoria:			
Glenelg River	1836		Mitchell
Buchan	1838?		earliest records of settlement

Edith and her father at the most northerly of the three passes through Rigg's Wall on the Cradle Mountain Plateau. March 28, 1939

Copied from stereo pair #SK284 by Major Ronald Smith

At the direction plate on Cradle Mountain. March 26, 1939

Edith and Major Smith, Sam Watson, John Braid, George Carey, Allison Morris

Copied from stereo pair #SK279 by Major Ronald Smith

PLATE 1

PLATE 3

Edith with her beloved dog Mutch, at Wee Jasper, New South Wales

circa 1959-60

Photographer Unknown

PLATE 4

Edith at Wee Jasper during a CSS "all girl" caving trip, Autumn 1960

Present Left to Right

(standing) Barbara Ryan (nee Kent), Sally ?, Edith Smith , with cup
(seated) Jenny Aujard (nee Castlehow), Judy Fitzsimon (nee Bell)