



GEOTOURISM IN A SMALL AND REMOTE RURAL COMMUNITY

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Although only 45 km northwest of Canberra, the Wee Jasper Valley must be considered as remote. Indeed, that is part of its charm. It has attracted cave explorers, geologists, palaeontologists and similar like-minded people since the 1830s. It is an internationally significant site for Early Devonian fish fossils and has many other important geological values including a nationally significant suite of cave and karst features – both geological and biological.

This paper outlines the European history of the Valley from a geotourism perspective from the 1830s until the development of a small show cave enterprise and episodic tours of fossil sites toward the end of the 20th Century. It then goes on to canvas ideas for the establishment of a visitor facility to enhance the visitor’s experience of the geology, landscape, fossils and karst resources of the valley.

Promotion of geotourism is seen as a way to arrest the population decline in the valley and to provide for employment in a rural environment at a time of difficulties in agriculture enterprises. To this end the Wee Jasper community is seeking to establish links with other communities where

geotourism is important for sustainability of rural populations.

Introduction

Although the hamlet of Wee Jasper lies only 45 km west of Canberra as a crow flies it can be regarded as remote as no roads directly join it with Canberra and there are still unsealed portions of road leading to the village. The population is about 65 people with a largely ageing population – although the village does support a school albeit with less than 10 pupils. The area was settled in the early 1820s or 30s and has been largely dependent on pastoralism and tourism ever since. However, during the 19th Century a number of the caves became attractions for visitors and locals. In recent decades cave usage has increased and a number of other geologically based activities have developed. The natural resources and history of the area are described in Spate (in press).

Geological setting

The Goodradigbee Valley at Wee Jasper is carved into the western limb of a north-south trending

anticline. The valley is aligned along strike and bedrock exposure of the various Devonian limestone units is very good and there are many scenic exposures of strata and structures en route to, and at, Wee Jasper itself. The valley floor is dotted with biohermal reef masses of purer limestone. Most of the caves and many of bedrock fossils are found in these masses. At the junction of the Goodradigbee and Murrumbidgee Rivers a large basin has been excavated in the limestone with Cave Island in the centre. Much of the limestone is seasonally inundated by the backed up waters of the Burrinjuck Reservoir and the resultant lichen removal and etching of the limestone surface makes for a very dramatic display of the bed rock fossils.

Geotourism history

Very little is known of the Aboriginal history of the valley but it would have been one of the routes used seasonally when the local peoples travelled to the high country in summer to feast on the plentiful and nutritious Bogong Moths (Flood 1980). The lack of anecdotal and other evidence of Aboriginal use of the caves and their surroundings at Wee Jasper is surprising given the apparent suitability of some of the caves for occupation and the fact that most other cave localities in south-eastern Australia have at least passing references to Aboriginal use (Spate 1993). There are, however persistent rumours of the presence, or past presence) of parietal art on cave walls but none has been observed in recent years. The only substantive reference is that of Bennett (1834, p 229) who states:

In a small cave attached to this cavern a number of human bones had recently been found, which it was afterwards ascertained were those of a native female, and had been deposited there, (in accordance with a custom among the aborigines of placing the bodies of deceased friends and relations in caverns, hollow trunks of trees, &c.) about twenty years before.

Dunkley, in Spate (in press), suggests that the first European visitors were the redoubtable Hume & Hovell who:

Traversed the length of the west side of Goodradigbee Valley, both ways between Murrumbidgee River and Wee Jasper, in October 1824 and January 1825, and named it Limestone Valley. They sent some of their men hunting 'the men returned but with no success, the rivers in this quarter abound with excellent fish the same as in the Lachling (sic) and Fish Rivers, they are equal to any fish I ever Eate (sic), either in this Country, or in England'. (Thursday 21 October, 1824).

Theirs was a remarkable journey for its time, and was accomplished without serious incident. However squabbles between them in later life distorted some of the facts, one result being that we are reliant largely on Hovell's diary and a third-person narrative based on the diaries and published by Dr William Bland in 1831. No mention of caves appears in Hovell's diary, and as Hume's diary has since

been lost, it appears that it was he who recorded caves, for in a footnote Bland says 'in their progress up this valley, there were observed several large and deep holes, apparently the outlets of some considerable subterranean cavities; rich, probably, in the organic remains of these regions.'

The first geological observations in the area were made by Dr George Bennett in 1832 (Bennett 1834) who visited what is now Cave Island in Burrinjuck Reservoir. He produced one of the earliest maps of an Australian cave and made notes on the geology of the district and of the presence of bone material in the cave. His cave map was unusual in that it included sections as well as plan views.

Another early visitor was the surveyor Granville Stapylton who was appointed by the Surveyor General Thomas Mitchell to conduct surveys of the Nineteen Counties beyond which Governor Darling had pronounced no land was to be taken up by squatters. The boundary in the Wee Jasper region was the Murrumbidgee River and Stapylton noted limestone in the Goodradigbee Valley in 1833.

Lady Jane Franklin visited the nearby Narrangullen Cave in the 1840s – definitely as a geotourist – as a side trip from Yass as part of her ride from Melbourne to Sydney following Sir John Franklin's period of governorship of Tasmania. She was the first woman to make this journey (Russell 2002). Other important geologically-oriented visitors to the valley through the 19th and 20th Centuries include:

- The pioneer colonial geologist, The Reverend WB Clarke, reported that:

The Goodradigbee Caverns [Pylon 58 Cave?] will repay research hereafter. It has already furnished me with the bones of birds, in which those of an emu are prominent (Clarke 1875, p55)

- In 1881 the NSW Legislative Assembly created a Caves and Rivers Exploration Committee (Legislative Assembly 1882). The Committee appointed a Charles Jenkins to remove bones from the main cave on Cave Hill (now Cave Island in Burrinjuck Reservoir). Unfortunately the material was lost on the train between Yass and the Australian Museum in Sydney. However it is clear that the material contained a range of extinct megafaunal species. The deposit has now been dated to the late Pleistocene (David Gillieson pers. comm.).
- Robert Etheridge Junr., Palaeontologist and Librarian of the Geological Survey of New South Wales visited and mapped Goodradigbee and Goodravale Caves (now known as Careys Cave and Pylon 58 Cave, respectively) and noted other caves in the vicinity in 1891 (Etheridge 1892-3).
- A J Shearsby was a resident of Yass through the early part of the 20th

Century. He was a qualified geologist, school teacher and pharmacy owner. He published a number of papers on the geology of the district and was a fierce proponent of the Yass-Canberra region as a site for the nation's capital suggesting amongst other values the tourism potential of the Wee Jasper caves. He photographed Careys and other caves from 1919 and some of these were reproduced in his *Tourists' Illustrated Guide to Yass District*, including *Burrinjuck...*, *The Beautiful Wee Jasper Caves*, and *Canberra...* published in 1921. He stated that:

Many other caves will be found in the limestone country in the Murrumbidgee and Goodradigbee belts, which only need the presence of tourists to induce the owners to open them up. Small caverns beautifully decorated are numerous between Good Hope and Taemas...

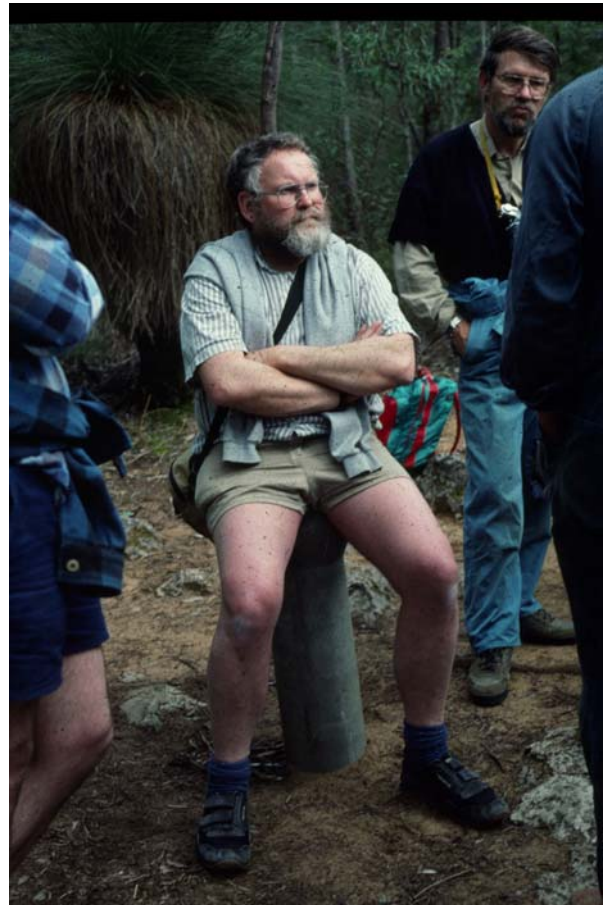
In the event, it was nearly 50 years before this happened. Goodradigbee Cave (under the name Careys Cave) was opened in 1968 during another surge of interest in tourism in the district.

- The well known palaeontologist Dorothy Hill published extensively on the Devonian corals and molluscs of the region in the 1940s and 50s.
- Organised speleology came into being following the Second World War and serious exploration and study commenced in the valley in the 1950s. At the same time palaeontologists from the British Museum commenced work on the remarkable Devonian fish. Studies in both fields continue to this day.

The caves and karst

Although the caves mentioned so far have been known from the 19th Century no mention is made until the mid-20th Century of the two largest cave systems in the valley – The Dip Cave and the Punchbowl-Signature-Dogleg Cave system. These would certainly have been known earlier than is recorded with the Shearsby mentioning them to members of the newly formed Canberra Speleological Society in the mid-1950s and recounting adventures in the 1930s. The Society developed from the activities of the Federal Fertiliser Company which was established to mine guano from Dip and Church Caves. Dr Joseph (Joe) Jennings, helped by many speleologists from Canberra and elsewhere, commenced his internationally recognised cave and karst research activities here. His mapping of these systems and of the Devil's Punchbowls (three well-developed dolines that are the subject of Australian Landform Example Number 1 – the first of a series published by the Australian Geographer; Jennings 1963a) and his subsequent explanations of the features and origins are exemplars of their field (Jennings 1963b, 1964, 1976; Schmidt et al. 1984).

Although they are close together, at similar elevation and thus presumably of similar age the Dip and Punchbowl systems are dramatically different. In both cases there are many hundreds of metres of passage – those of the Dip Cave are strongly aligned along the strike with the cave made up of five parallel sets of passages dominated by large breakdown chambers. Although the cave is dominated by the direction of strike and by the near vertical nature of the dip the name arises from the name of the paddock in which the cave is found. That name arises from an old sheep dip! The individual passages are connected by small openings. The cave is well decorated in parts and receives many visitors.



Andy Spate pole-sitting at Margaret River – 1991

In contrast the Punchbowl system is not strongly controlled by the rock structure but consists of a series of horizontal passages with much evidence of epiphreatic flow. Each of the four levels is joined to the one below by vadose canyons where downcutting was rapid. Connections to the lowest, fifth, level – Dogleg Cave – are not known. The cave was formed by capture of a small stream which now breaches the topographic divide of Punchbowl Hill. Associated with Punchbowl Cave are three well-developed dolines.

Careys Cave – the show cave – is a phreatic cave several kilometres distant from the above two systems. It was developed and provided with electric lighting in 1968 but was shown regularly to visitors well back into the 19th Century. It is probably the smallest show cave operation in Australia but is a beautiful cave with beautiful rock sculpturing and colours.

There are hundreds more caves – largely on private property – scattered along the valley. The most significant of these are those of the so-called Thermal Paddock where they are warmed and watered by thermal springs. Church Cave contains a maternity site for the vulnerable Eastern Bent-wing Bat. There are also endemic cave invertebrates of great evolutionary significance.

Palaeontological values

Bedrock fossils

The Taemas Limestone and, indeed, the other sedimentary rocks on the rock sequence are often highly fossiliferous through a period of 20 million years sediment deposition. It is said to be one of the best continuous sections anywhere in the world at this part of the Lower to Middle Devonian – about 410 to 390 million years ago. The upper two kilometres of the sequence documents a transition from marine to freshwater conditions with river and lake deposits with abundant fish, plant and some arthropods. Two major events in Earth history occurred during this time interval: evolution of the first forests and the transition of fish-like vertebrates into terrestrial environments as the first land animals.

Recent discoveries include many new fossil sites recording freshwater fish, some of the earliest examples of land vegetation and forest soil formation, fossilised mudcracks and raindrop prints and many other structures indicating a large tropical river delta. The limestone sediments lie above these environments and show exceptional exposures of preserved fossil reefs, with back-reef deposits of crinoid gardens and coral colonies in growth position, and a fore-reef of rolled coral blocks and debris that accumulated in storms over the ancient reef front.

The Burrinjuck fossil fish fauna in one of the most diverse known from rocks of this age and includes 48 genera and species that have been documented in over fifty scientific publications. Thick-skeletoned placoderms are the most abundant, and the exquisite preservation of the fossils permits examination of the neural system. The oldest lungfish in the world occur here, as does the oldest known braincase of a bony fish.

Exceptional specimens from the area include a perfectly preserved 'eye capsule'. To quote Young pers. comm. 2007):

This structure completely enclosed and surrounded the soft tissues of the eye, and reveals intricate details including nerves and muscle attachments controlling eye movement, and tubules connecting the optic nerve and associated blood vessels to the retina. No comparable specimens exist elsewhere.

Other bedrock fossils present include:

Corals. These are preserved with the fine structure still present that show evolutionary changes that occurred through time. Two major groups are present – Rugosa and Tabulata – and these are present throughout almost all of the

limestone sequence. These fossil corals can be seen clearly in situ in the Coral Wall at the east end of the No. 1 Upper Passage and the south wall at the east end of No. 5 Series in the Dip Cave, and, perhaps most spectacularly, in the Fossil Wall Chamber in Punchbowl Cave as well as in many surface sites especially when low water levels in Burrinjuck Reservoir reveal the water-washed limestone.

Molluscs. Many of these are preserved in silica, and like the fish bones, can be easily and successfully extracted with mild acids (a technique first developed for Wee Jasper fossils). Many have been described and they show the ecological changes as the ancient oceans varied in depth. Of importance are the nautiloids which began their history as straight shells and modified their shape to become like the coiled Nautilus of the present day. Many of the primitive and more modern types are found at Wee Jasper. An excellent example of the primitive straight nautiloids can be seen in Careys Cave. There are many examples of bivalve and gastropod molluscs found through the sedimentary sequence.

Conodonts. These are very fragmentary fossils derived from very primitive fishes. They occur world-wide and are very important for geological correlation. Excellent specimens from Wee Jasper have contributed to the International Stratigraphy Correlation Program.

Algae. The base of the limestone lies on volcanics and during the long period when this transition occurred, algal mats occur in sheets just as they do today in the Gulf of Mexico. These surfaces dried out and produced mudcracks – Wee Jasper has excellent examples of mud-cracked layers of such algae.

Quaternary fossils

Whilst there has not been any systematic work on the Quaternary fossils for many years there is still much fossil-bearing material especially in Dip Cave and probably in Punchbowl Cave. Other small caves are also known to contain bone deposits. Mention has been made above of the observations of Bennett, Clarke and Jenkins on bone material from the caves. Etheridge (1892-3) discovered a single tooth of Thylacoleo, probably *T. carnifex* in Goodradigbee [Careys] Cave.

In 1957 part of the skeleton of the extinct megafaunal marsupial *Nototherium* sp. was found in Mud Crack Chamber in Punchbowl Cave (Jennings 1964). This giant wombat-like marsupial is considered important in the evolutionary history of the Diprotodontia, which is the most diverse marsupial order (Ride 1959).

Jennings (1963) reported on the occurrence of bone breccia deposits in Dip Cave from which the remains of the following animals have been identified:

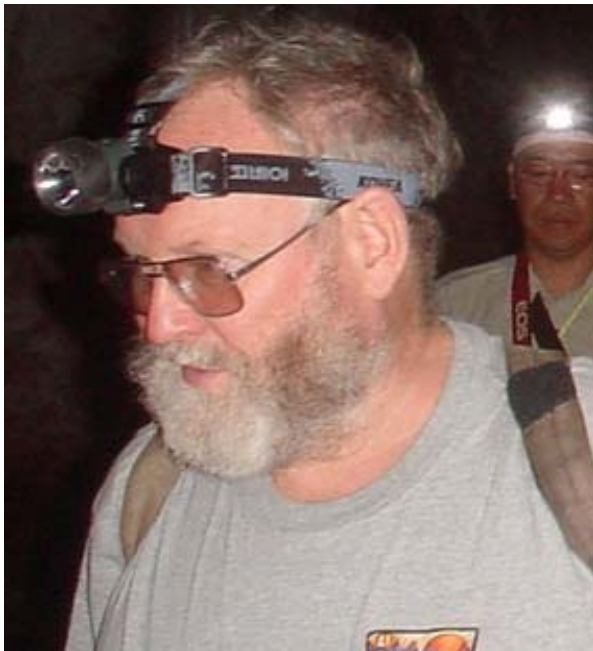
- Murids of the genera *Rattus*, *Pseudomys*, *Gyomys* and *Mastacomys*;
- Marsupials of the genera *Cercartetus*, *Phascolarctos*, *Antechinus*, and *Petaurus*, and;

- The large megafaunal kangaroo *Sthenurus* sp.

Although difficult of access, much material remains in the cave.

Skeletal material from an excavation in Punchbowl Cave revealed the extinct White-footed Rabbit-rat (*Conulurus albipes*), the Broad-toothed Rat (*Mastacomys fuscus*) both of which are no longer found in the area, the extinct megafaunal kangaroo *Sthenurus* sp. and several species of murids.

In the 1970s Geoff Hope (pers. comm.) removed skeletal material of the extinct megafaunal Family Palorchestidae, from an unknown cave at the foot of Punchbowl Hill and in 2000 Ian Cathles (pers. comm.) recovered a skull of the extinct Thylacine (Tasmanian Tiger, *Thylacinus cynocephalus*) and teeth from the Tasmanian Devil (*Sarcophilus harrisii*) and from the extinct Rat Kangaroo (*Bettongia* sp.) from a small cave at the foot of Cathedral Rock.



The definitive Andy Spate

Current geotourism activities

The valley is a popular destination for campers and day-visitors who fish (when there is any water!), appreciate the scenery and quiet surroundings and visit the caves. There is a plethora of accommodation in the valley and this is the backbone of a number of family enterprises.

The caves are heavily used by casual and organized caving groups. Visitor numbers to each of the Dip and Punchbowl systems exceed 300-400 a month with many of those visitors camping and contributing, if only in a small way, to the local economy. However, many of these visitors receive little or no appreciation of the geological heritage and treat the caves only as 'underground gymnasias'.

Still more, but considerably less than 10,000 visitors come to visit Careys Cave annually. The

tours of this beautiful cave place considerable emphasis on providing a meaningful appreciation of the geological heritage of the cave and of the valley.

In recent years, fossil tours have been conducted on Cooradigbee Station where both invertebrate fossils and fragments of armoured fishes can be seen in the water-etched limestone. The community has been conducting biannual Wee Jasper Naturally weekends which have included:

- Specialist cave tours (and concerts);
- Guided walks over Punchbowl Hill explaining the nature of karst landscapes and the evolution of the Yass-Wee Jasper landscapes;
- Fossil tours on Cooradigbee Station;
- Wild cave inspections;
- Caving safety, equipment and technique sessions;
- Static displays of cave and karst features;
- Evening lectures on flora and fauna;
- Evening cave bat fly-outs (in season); as well as
- Art exhibitions and similar displays.

The valley is also used by students and researchers from the universities and schools of nearby Canberra and region as well as from further afield. Many of these visits are geologically based.

The way forward

With the pastoral industry virtually static and perhaps, declining, a number of residents of the valley are looking for ways to augment the community economy. The current long-term – seemingly endless – drought has dramatically reduced tourist numbers and thus inputs to the valley economy.

Currently the valley hosts a range of accommodation styles from high quality to basic bush camping, a small vineyard, a café stocking basic grocery items and some fishing equipment, a tavern and small tourist cave operation. The New South Wales Lands Department operates five very popular camping areas three of which offer only basic facilities. The facilities at Careys Cave are very basic.

Ideas for the future are largely based around Careys Cave and fossil tours of the bedrock fossils revealed by the low levels of water in Burrinjuck Reservoir. Even if the current record-breaking drought continues, irrigation and environmental flow demands are such that low levels will continue for the foreseeable future.

In 2007 the community sought an Australian Tourism Development Program – Category 2 – Integrated Tourism Development Projects grant for the development of a museum/visitor centre at or near Careys Cave under the banner of Ancient Seascape Interpretive Centre.

The grant application had wide support from tourism groups, scientists and an organization concerned with cave, karst and fossil education

and research but was ultimately unsuccessful. Other grant approaches are being pursued.

Opportunities for further geotourism activities building on the Wee Jasper Naturally weekends are limited, especially as the pool of people available to lead activities is very limited and signs of declining enthusiasm are evident.

One idea that is currently being explored is the linking of eastern Australian fossil sites into one 'Fossil Highway' to attempt to try to tap into the migratory tourism circuit – the 'grey nomads'.

A fossil trail has been developed in South Australia linking the Ediacaran sites in the Flinders Ranges with the World Heritage Naracoorte Caves Pleistocene/Quaternary fossil mammal site as well as other sites in that state. In Queensland a 'Dinosaur Highway' trail system has been developed linking Winton, Richmond and Hughenden with the Cretaceous dinosaur stampede site at Lark Quarry and with the World Heritage Tertiary vertebrate fossil at Riversleigh.

Our concept is of links between Naracoorte and Riversleigh taking in:

- The Cretaceous dinosaur site at Inverloch, Victoria;
- The Devonian fish and invertebrate fossils of Wee Jasper, New South Wales;
- The National Dinosaur Museum in Canberra, Australian Capital Territory;

- The Age of Fishes Museum at Canowindra, New South Wales;
- The Wellington Caves Pleistocene /Quaternary fossil site, New South Wales; and
- The Dinosaur Highway and museums of central western of Queensland.

There may well be other sites such as Murgon, Queensland, which could be added to the list above. The underlying concept is to build connections between the eastern Australia dinosaur sites and museums to cross-promote the various businesses and to build a better understanding of Australian geology and of the evolution of landscapes and life forms development amongst the travelling public.

But for Wee Jasper itself it seems that unless a visitor centre or similar facility is established that can be at least partially self-supporting geotourism will remain the low key operation that currently exists.

Such a centre would warehouse, archive, educate and build appreciation of this small, but significant part of Australia's heritage. Given the manifold and easily seen geological values – the caves, karst, fossils and scenery – it seems unfortunate that the area cannot be better used and appreciated, and have a better economic base.

* This paper was presented at the Inaugural Geotourism Conference, Perth, Western Australia.

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