CENTENARY CAVE

Grant Gartrell

Just over half a century ago I went caving in Mullamullang (6N37) and wore out a brand-new pair of genuine leather army boots in a week, right through the soles. It is at last seeping into my consciousness that I couldn't do that these days. It is coming as a bit of a shock that I look at all the old guys around me and realise that I am one of them. It has been fun, and I am still having fun, but it is high time I ferreted around in the dark recesses of my mind and put some of it down on paper if I want any of my half-finished projects to be any further advanced before I have to hang those boots up altogether, or if I want the corporate memory to live on. How could that possibly happen? Don't let anybody kid you. Age is sneaky.

My father-in-law, Alf Humble, is one hundred and one years old. He was a flying instructor during WW2 and finally gave up flying 20 years ago, but he is actually older than the Royal Australian Air Force (RAAF), which had its own 100th birthday on 31 March this year. I found a new cave on 31 March, and named it "Centenary Cave" in recognition of the RAAF Centenary falling on the same date. I have a fair idea of what the cave should look like, but I have never seen it. I have never been in it, and don't even know precisely where the entrance is. Nevertheless I know a great deal about it, and by the end of this article, if you persevere, perhaps you will as well. If you have a good pair of secateurs and a crowbar, you might yet even be able to participate in the discovery.

I have never been in the Air Force either. But for almost two decades I was attached to the RAAF's Aircraft Research and Development Unit (ARDU) as a civilian Scientific Adviser to a succession of Commanding Officers who were each posted to the Unit for several years. We had test pilots, engineers, armaments experts, photographers, all sorts of specialists and support staff. It was a privilege to be working amongst such an outstanding group of people, and a wonderful experience.

It came back to bite me almost 25 years ago when I found myself in a somewhat adversarial position over the destruction of Sellicks Hill Quarry Cave. As cavers we wanted to save a spectacular cave which had been uncovered within a quarry, but both the quarry company and the Department of Mines really just wanted it to go away, and in an atmosphere of some secrecy, blew it up. Instead of their problem going away, that action unleashed a whirlwind of community outrage that did everything except bring the cave back. During a reasonably emotional TV interview I went to air on Channel 7 describing the actions of the senior management of Southern Quarries as those of a bunch of cowboys, and suddenly found myself in receipt of a threatening letter from the SQ lawyers. Channel 7 received a separate letter for broadcasting the interview. When asked, I confirmed to Channel 7 that the term cowboys was the most accurate I could think of at the time. Pleasingly the station's lawyers were prepared to support my contention at which point Southern Quarries threw in their hand in that particular poker game. But they couldn't resist one more little jab, and accused me of working in "weapons of mass destruction". This phrase was popular at the time and applied by US President George W. Bush and others to those he called the "axis of evil" during the Iraq War. However, this accusation was levelled against me by Southern Quarries because of my association with the RAAF, and thus became an unwarranted slur against a section of the Australian Armed Services who were constitutionally and honourably engaged in the sovereign defence of our nation. Despite all this I quite liked a couple of the people from Southern Quarries, and believe that at least their initial intentions were sincere and enlightened. We did get on well there for a while. Like divorcees who were once happily married, I still regret that our positive relationship with them got derailed.

Why am I telling you this apart from the fact that at the time it kept me awake for months on end? Principally because of the obvious contrast between those days and the story that follows, about Centenary Cave. We will probably, and hopefully, never see those days again.

REMOTE DETECTION

Remote detection has particular application in geographically challenging circumstances. Back in the early 1960s, long before we could rely on GPS devices, a significant number of major Nullarbor Caves were first discovered at the Australian National University in Canberra, by geomorphologist the late Professor Joe Jennings poring systematically over aerial photographs. Mullamullang Cave was one such cave discovered remotely by Joe, and the primary purpose of the 1963-64 Nullarbor Expedition led by Ted Anderson was to go and check it out. Due to a prior commitment I was unable to participate in that particular adventure, but found myself out there 2 years later as one of the organisers of the 1965-66 follow-up expedition.

Joe was a much loved and revered member of the Australian caving community and an outstanding contributor to our knowledge base. He set a standard for finding caves remotely that might be hard to beat, but is well worth following. It is still used routinely on the Nullarbor, and more recently on Kangaroo Island, and now even has application for Centenary Cave.

I have just re-read the obituary for Joe written by D Walker, accessible from Google. I recommend it highly. Joe died relatively young while skiing in the Snowy Mountains near Eucumbene back in 1984. He was born in 1916 on the 29th of June, and if still currently alive would be 105 years old. While well short of that age myself, I have become old enough to be aware of how fast time flies, and just how much accumulated knowledge will depart with me down the plug-hole when my own time runs out. Few will appreciate just what is valuable about half the irreplaceable junk in my shed, let alone in my brain. Accordingly, I have become increasingly aware of the need to try to transfer not only some of that knowledge, but even more particularly my enthusiasm for its significance, to younger generations of cavers and cave managers, and even, if possible, to the community at large. It is still far too easy for our broader community to make poor decisions based upon a lack of awareness of our karst heritage, and even if I am starting to puff a bit harder and wonder how many heartbeats or Saturday nights I have left, I would really

like to change that situation. And so, obviously, would many cave people around the world, who have taken the opportunity, for that very reason, and others, to get behind the wonderful initiative of the International Year of Caves and Karst.

THE INTERNATIONAL YEAR OF CAVES AND KARST

The default position for caves has for far too long been out of sight and out of mind. The year 2021 is being recognised around the world by the UIS (International Union of Speleology) as the International Year of Caves and Karst (For information see IYCK2021.org). I suggested in a letter to the Premier of South Australia, the Honourable Steven Marshall MP, dated 28 January 2021, that this would be a wonderful opportunity for South Australia to participate in, and celebrate this occasion, by recognizing, and taking the initial steps towards recovery of access to a couple of significant cave systems, one of which formed initially within what is now the Reservoir precinct at Myponga.

My enquiry was forwarded from the Premier's office to the Honourable David Speirs MP, Minister for Environment and Water, to respond on the Premier's behalf, and Minister Speirs' positive response (4 March 2021) has opened the way for discussions with SA Water staff whom I have also found to be interested, positive and supportive. I met with the Myponga Supervisor on the morning of Wednesday April 7, 2021. Since he has been Supervisor for a decade, and the events that I raised with him happened over 60 years ago, it would not have surprised me if he were to be somewhat surprised himself at what I had to say to him. Instead, he surprised me at just how quickly he picked up exactly on what I was saying, and how much his own observations over time had keyed in with mine in a complementary fashion. I am very fortunate indeed that he is the person to whom I have been directed, and feel more encouraged to hope for and even expect a successful outcome to the project as a consequence, even if the way forward is not as obstacle free as I would like it to be.

Although nobody has ever extensively explored a significant cave system at Myponga, please accept for the moment that there is plenty of evidence for its continued existence. One of the principal features of caves such as this that seems to be least understood by the community at large, apparently including some mining engineers, who you would imagine should know better, is that they are generated as integrated drainage systems in the same way that valleys of erosional origin are formed. The difference is that karst caves are principally created by the accumulated impact of solutional processes over similar timescales, although erosional processes may also make an impact.

An important point to understand at the outset is that, just as for valleys, caves must form when the conditions are right. That is to say, when the factors that cause them all align, there is no choice in the matter. They are not optional, any more than the outcome of the force of gravity or other laws of physics is optional.

In my experience, one of the more difficult concepts to grasp in regard to the formation of caves is our appreciation of the impact of the passage of time. We are on earth for such a short time ourselves that we learn to simply accept the current landforms as we find them, to perceive them as static. We know that hills green up in winter and dry off in summer, but we generally don't perceive valleys deepening, nor, until recently, significant climate change, in our lifetime.

The Precambrian Brighton Limestone in which the cave has formed is some of the oldest limestone on Earth. Limestones are composed of the calcium carbonate based skeletal remains of living creatures, and Precambrian limestones are based on the very earliest of such lifeforms that ever existed. They were laid down on a sea floor approximately 600 million years ago, while Australia was part of the Gondwana supercontinent, and much has happened to that sea floor since then. It was tipped up on edge during a major mountain building period known as the Delamerian Orogeny from 520 to 490 million years ago, and has survived until the present through a long sequence of equally impressive changes such as the relatively recent separation of Australia from Antarctica, naturally accompanied by substantial variations in climate. It is not yet known just when, over this period, the cave first started to form. There is a reasonable expectation that this may have been a very long time ago, and that evidence of some of this ancient geological history may still be preserved within the cave. If so, and there is an opportunity in the future for scientists to have a close look at this cave, some fascinating insights into our geological pre-history may be revealed.

I learned from the Supervisor, who has been doing his own research into the history of the area, that prior to the construction of the reservoir, there was, naturally enough, a creek along the bottom of the broad Lovely Valley. Downstream, the creek is impressive enough as it passes through a series of steep gorges to deserve the title of the Myponga River. In the upper reaches where it passed through the Oldfield's grazing property, it was a good creek with a deep swimming hole. When I told him about Reg Oldfield smoking foxes out of holes on the headland jutting out into the Reservoir just to the east of the dam wall, he asked me how much further to the east of that point the limestone outcropped, and then made the association that the swimming hole was located in close proximity to that point. Quite possibly, drainage through the limestone may have helped to maintain the depth of the swimming hole.

Accepting that the cave does exist, then like any other cave it represents a significant asset for the state, that can, if managed appropriately, be held in perpetuity. It is very much in our interests that any project which might impact upon it includes an adequate environmental impact assessment, not only in the interests of protecting, or at least including in the equation, the true asset value of the cave, but, as was highlighted particularly vividly in this case, in assessing the viability of the engineering project itself.

From bitter experience, I have to point out something that I wish was far more obvious. Being an excellent engineer, or a really competent bull-dozer operator, doesn't automatically qualify a person as an expert on karst values, any more than it would qualify that person to carry out brain surgery. Cave exploration and assessment can often be a slow and careful process, and necessarily of long duration. Our fossil cave discovery back in 1969 at Naracoorte happened after the cave in which it was made had already been open to the public for 75 years. As it is now World Heritage listed, it attracts a range of visitors from all over the world to South Australia, or at least will again be so doing once tourism recovers in the post pandemic era. Incredible discoveries are being made right now under the Nullarbor in caves that have been known for decades. Extremely important evidence of the earth's early history may be lost when newly unearthed caves are not given the benefit of sufficiently expert assessment prior to decisions being made by inadequately qualified people about their intrinsic asset value to the state.

The second aspect of poor decision making, as will become clear below, is that when we don't properly take into account the consequences of karst development, we do so at our peril.

CONSTRUCTION OF THE MYPONGA RESERVOIR

South Australia has had its outstanding successes, as well as episodes which could have been handled better. One of the latter occurred about 60 years ago and was associated with the construction of the Myponga Reservoir. A substantial cave system that would have, and should have, been predicted by more comprehensive and karst aware environmental impact assessment processes, was instead unexpectedly encountered during dam construction. This was first mentioned in a short report I made in the Cave Exploration Group of South Australia's CEGSA News No 178, published in May 2000, which included a report from former CEGSA Member, the late Len Dallow, who was employed at Myponga as a Technical Assistant for the Engineering and Water Supply Department during the construction of the dam.

Construction of the concrete dam wall and spillway for the Myponga Dam commenced late in 1957. As

Myponga Dam Under Construction and in Flood September 1960

would be expected for a project of this expense and magnitude, geological expertise was sought from the SA Department of Mines in regard to the suitability of the limestone and slate bedrock to take the footings for the dam wall. Unfortunately the advice received was far from accurate because the Mines Department geologist(s) involved were clearly not up to speed on karst processes. One could perhaps in mitigation offer the defence that not many people at that time were well versed in karst processes, or karst values, but that would be no excuse today. The advice was that while some minor cracks could be expected in the bedrock, and therefore some minor grouting would need to be undertaken, the location was suitable for construction of the proposed dam. It was therefore a big surprise to find that when the dam wall was almost completed, after the expenditure of £1,100,000 (in today's money, about $37,000,000), the dam would not hold water. While the Mines Department's assessment of the rock was quite reasonable in general terms, they had failed to take into account the capacity of the pre-Cambrian limestone to develop over millennia significant karst drainage features, and its relationship with the topography of the former Lovely Valley was such that that karst drainage commenced a short distance upstream of the dam wall and ran directly underneath it.

The situation was so serious that even at that late stage, the project was within a gnat's whisker of being abandoned, because while more extensive grouting might be possible success was not guaranteed and the magnitude of the increase in unexpected extra expense possibly somewhat exponential. Eventually the extra work was carried out and the cost of the project increased, to the best of my knowledge, by around 350%. Most of the additional cost was attributed to the injection, under pressure, of a large amount of cement grout into several hundred 2 inch (50 mm) holes drilled up to 200 feet (60 m) deep to seal the network of cavities.

What has not been mentioned, up until now, is that, apart from Len's report of a Mines Department geologist climbing into a chamber of the cave uncovered during excavation of the earthworks for the concrete spillway; breaking off a stalactite; and observing at least a 20 metre deep shaft going down, there was never any serious assessment of the extent or heritage qualities of the cave system, other than an attempt to gauge the extent of the cave by pumping a large quantity of water into it.

Even if undiscovered and at the time unappreciated, the cave system must have been a significant asset for the State of South Australia, just as the Naracoorte caves are today, and therefore an asset the value of which should have been factored into the total cost of the project. To do this should be a basic part of the environmental impact assessment process prior to undertaking the project, and if the Department of Energy and Mining does not have the expertise, then it should be, and perhaps these days would be, obliged to seek it out. One of the basic difficulties in any scientific investigation of this sort is the old conundrum of not knowing what it is that you don't know, which is why it is particularly important to carefully prescribe well ahead of the need arising the expertise that should be engaged to carry out such assessments.

But of course, that is not the end of the matter either. The configuration of the bedrock in the area is such that the Brighton limestone is nominally a hundred or so metres thick, steeply dipping and constrained between beds of far less soluble rock. It is quite clear that the section of cave into which the grout was injected was by any measure a very small part of the full extent of the cave system, which would of necessity extend for pretty much the full length of the Brighton limestone bedding until it has an opportunity for the water draining through it to reach the sea. Further to that, it would appear that the bedding has lain in approximately the present orientation, with the complication of continuing adjustment of various fault lines, since the Delamerian Orogeny, and would have adjusted appropriately to substantial sea level changes over that time. A large quantity of water containing concentrated fluorescein colouring was pumped into the cave when it was first located. While none of this water appeared in the valley downstream of the dam, fishermen reported the sea turning green several kilometres from the coast several days later.

Even though expert cavers were not called in to determine the extent of the intersected cavity, much can be inferred by analysing the grout injection. If we begin by considering a cave with tunnels nominally 2m in width and 3m in height, then 24,000 cubic metres of grout would occupy a total tunnel length of 4km. Even if the cave had four such tunnels in parallel under the dam wall, they would all have to be blocked for 1 km to take all the grout. This is clearly a most unlikely scenario, so we come back quite quickly to considering a larger tunnel, possibly 10m wide and 20m high, which would perhaps fill from floor to ceiling for

80m and then taper down to floor level over a further 80m at quite a low angle of repose. This model seems a far more likely scenario for an extremely substantial grout plug, for reasons which will become clearer later when we consider in more detail the physical properties and logistics of injecting the grout. At the same time it infers that a further 5 to 10km of limestone bedding downstream will still include potentially accessible cave of similar dimensions, perhaps with larger chambers interspersed with constrictions and more rapid drops in floor level as seems to be the situation in most caves in similar circumstances. Such a cave must clearly have existed. Despite the events that have happened to it so far, including blockage of an upstream section by grout, and the associated diversion away from it of what would in the past have been significant underground stream flows, over 95% of it should still be intact.

FURTHER CONSIDERATION OF THE GROUTING OPERATION

Although only a small section of the cave was entered when cavities were broken into during construction of the dam spillway, in totality, even at this stage we know a surprising amount about it.

We know that when 36,000 cubic metres of water was pumped into it over a 12 hour period, the cave showed no indication that acceptance of this water was being limited by the capacity of the cavity. The reports from fishermen of the sea turning green several miles out from Myponga Beach were a clear indication that water must have flowed quite freely for a long distance through the cave, which therefore had to be reasonably accessible over that entire distance.

Although we have not been able to access detailed records of the grouting program, anecdotal accounts when combined with a basic understanding of the properties of cement grout, tell us a great deal more about the dimensions of the main cavities under the dam wall, and consequently, because of the inherent purpose of the cave as a karst drainage system within the limestone bedding, also tell us that such dimensions can be expected to be indicative of the rest of the cave between Lovely Valley and the efflux of the cave now below current sea level.

The grouting program was carried out by drilling a curtain of 2 inch (50 mm) diameter holes 200 feet (60 m) deep close to the base of the dam wall. Each hole had a cross-sectional area of about 20 square centimetres, and a total volume of approximately 0.12 cubic metres. If no cavities had been intersected, that volume would represent the total amount of grout able to be injected into each hole.

However, it was reported by Len Dallow that many holes took as much as 4000 bags of cement, a volume of 120 cubic metres, and in some instances a second hole drilled only 12 inches (30 cm) away, would take a similar amount of grout. It is understood that about 200 such holes were drilled, taking around 800,000 x 40kg bags of cement, making 24,000 cubic metres in total.

One might imagine the grout flowing for large distances, but a basic property of the grout is that once the cement is mixed with water, the mixture has a lifetime of 1 hour or less before a chemical change causes it to set. It is also clear that although it may be pumped into the initial bore-hole under pressure, in the majority of instances where it escapes from that bore-hole into a larger intersected cavity, it spreads out under much reduced pressure from the injection point, forming a cone with a natural angle of repose of about 20 to 25 degrees. Once that cone rises up to block the drill hole, it may limit the ability to pump further grout down the hole. Most holes stopped taking grout after accepting 4000 bags, but some blocked after a lesser quantity. Given that it would be logistically a very demanding job to mix and pump as much as 4000 bags into a hole over a period of an hour, this could be expected to impose a physical limit on the horizontal migration of the grout. My back of the envelope sums suggest this would require a 5 cubic metre concrete mixing truck to be backed into place, dump out a full load into a pump, and get out of the way to make room for the next truck all within a period of 2 minutes. You can take longer if you don't mind the early loads setting before the last portions of the 4000 bag batch are being pumped. That process would simply tend to result in much steeper angles of repose and therefore more compact grout plugs on average which would further limit the horizontal spread of the grout. This should not be an issue for the overall effectiveness of the grouting program, but would further support the notion that the grout curtain would tend to be confined to the more immediate vicinity of the dam wall, and almost certainly within 100 metres of it.

Myponga Dam Finally Filling September 1962

WHAT REMAINS AND THE IYCK

What we have demonstrated so far is that despite the injection of a considerable quantity of grout into the cave, over 95% of the downstream section of the cave should remain basically in pristine condition, and therefore an important asset for South Australian, and perhaps even global, science and tourism. Access to this cave system in the Myponga area would be consistent with the recent very positive moves towards community access for recreational purposes to the Myponga Reservoir Site and would be a most fitting way in which the South Australian Government, which has been showing a generally very positive approach to environmental matters, could extend this to recognition of the state's valuable karst heritage as a symbolic contribution to the International Year of Caves and Karst, and of course deservedly enjoy the resultant positive publicity which would arise.

ACCESSING THE CAVE – THE THEORY

Apart from Mr Reg Oldfield employing smoke to drive foxes out of a network of cavities, there had been no known investigation of the limestone for caves prior to the dam being built.

As events subsequently transpired, this was a serious oversight, but perhaps we need to reflect that the world was a different place back in those days, and that karst

science was nowhere near as well developed as it is today. People certainly explored caves well before that time, as evidenced by the historical writings of the Rev Julian Tenison-Woods in the mid-1800s. But the Cave Exploration Group of South Australia, with its history of compiling a record of cave data for South Australia in association with the South Australian Museum, first came into existence in 1955, only a couple of years before construction of the Myponga Dam started.

So while we may need to cut our forebears a little slack in this matter, there is no excuse for us not to make the best of the situation in terms of our modern understanding of karst processes, and do our very best to access what remains a significant state asset, the existence of which may never have been confirmed but for this fascinating story.

While we have been greatly assisted by the above analysis to arrive at the firm knowledge that such a significant and substantial cave must exist, we have yet to gain access to it.

Fortunately, there is yet another property of massive limestone which may help us in this regard. The limestone will include a natural network of joint cracks, some of which will be more successful than others at providing pathways for groundwater to access the cave.

While the main channels in the cave started somewhere in Lovely Valley, and are now blocked by the engineering works, other secondary channels will undoubtedly exist that may or may not be immediately accessible to cavers, but which would offer opportunities for exploration/ perhaps enlargement/following drainage pathways, to gain access to the cave.

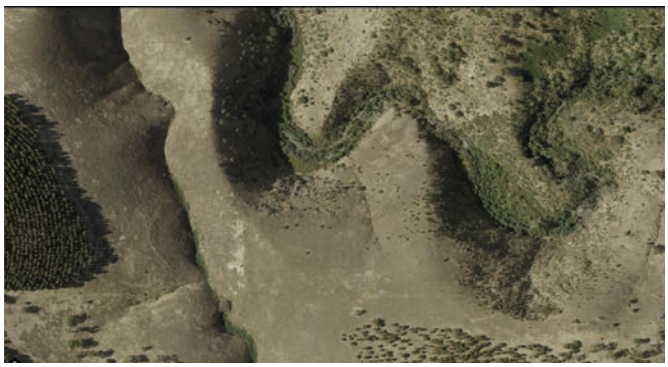
Our approach to the Premier was to seek permission in the first instance to enter restricted areas so that we could conduct a thorough investigation of the limestone and valley(s) downstream of the reservoir wall with a view to possibly locating one or more locations downstream for access to the remainder of this cave.

Some of this work may fortunately already have been done for us. Thanks to the amazing capabilities of the publicly available computer program "Google Earth", combined with the historical geological mapping of the Department of Energy & Mining, it is possible to superimpose an image of the geological strata over an image of the surface features of the land, and use this to identify the best places to look for such possible access points.

The latest aerial imagery used in Google Earth suitable for this purpose at Myponga was photographed on March 23, 2020. The special attribute of this particular time of the year, almost exactly one year before carrying out this investigation, is that it was at the end of a particularly hot and frankly quite dreadful summer, including a number of extreme heat events which made bushfires in the Adelaide Hills and especially on the western end of Kangaroo Island so devastating.

What that same weather did to the landscape west of the Myponga Dam wall was to severely dry off the hillside vegetation leaving greenery confined to areas with any remnant water such as the bottom of valleys. This contrast between green and dry is particularly notable in the photography of the vegetation immediately adjacent the Myponga River in the steep gorge below and downstream from the dam wall, and even on two major bends in the river which are the only downstream places where the river valley itself intersects the limestone.

Progressing a short distance further to the west, the geological map shows the limestone beds breaking away from the river and starting to head in a more south-westerly direction. The limestone crosses a valley containing a tributary to the Myponga River flowing from



Google Earth View of Myponga River and Tributary with Green Vegetation.

south to north which joins the main river a little further to the west.

Even at the end of summer, that tributary valley also has green growth, along the bottom only, for only half a kilometre or so in total. The green growth ceases at the point at which the valley crosses the limestone, strongly suggesting that, particularly at times of low flow, the water flowing down the valley is completely captured by the limestone, and therefore follows a more vertical pathway down into the cave. This looks like a very good place to start investigating access. SA Water's Myponga Supervisor acknowledges that the green vegetation all year round in the bottom of this particular tributary may well be a consequence of leakage running down the hillside from a nest of settling ponds constructed on the top of the hill. These ponds are part of the filtration plant which was installed many years after the initial construction of the reservoir. They were designed and installed to dry out sludge regularly being removed by the filtering process. The sludge, once dried, is then trucked elsewhere, and the process rotated to the next in the series of ponds. There is no particular problem with a percentage of the water leaking from the ponds, as long as the sludge itself remains contained.

We can infer from this observation that without the leakage from the settling ponds the valley floor would be unlikely to be green at the end of summer. There would be no obvious indication of interception by the limestone of water flowing down the valley, and consequently much less chance of locating a suitable spot for accessing the underlying cave system. Thank you settling ponds, and thank you leakage.

It is important to note that this does not imply that the only water ever flowing down the valley is from the settling ponds. Clearly the valley has been shaped by largely erosional forces over most of its life, and even at the point at which it crosses the band of limestone, those erosional forces will still be present. However, additionally within the limestone there will have also been capture of water by joint cracks over an equally long period of time and enlargement of joint cracks by solution. There is therefore a reasonable chance of locating a significant solution feature at the point at which the creek floor vegetation changes back from green to brown, even if we have to dig for a while to get past a choke of rocks generated through erosion.

There is one other inference that we are able to draw from this observation. Below this particular entry point for water into the cave below, the cave itself must be open and accessible to the water entering at this point. If that were not the case, then instead the indicated shaft would not take all that long to fill with water, after which the water would then continue to flow further down the tributary, causing a continuation of the green vegetation down the rest of the valley.

Experience in many other caving areas, including Naracoorte and Sellicks Hill, tells us not only that a shaft is likely to exist at this location, but that the shaft will have been in existence for a considerable period of time, and even if partially blocked near the surface may have been sufficiently enlarged by the action of water to facilitate access. There is a reasonable expectation that we should, perhaps after digging, be able to locate at least a small opening in which it may be possible to detect airflows correlating with atmospheric pressure variation and perhaps even in this particular instance tidal fluctuations in Gulf St Vincent.

My favourite Naracoorte shaft story concerns a shallow blind sink that in my youth I once jokingly jumped vigorously up and down in, trying to create a new cave. Fortunately nothing happened, but 6 weeks later, when we returned, there was no longer a blind sink, but instead a smooth, circular 20 metre open shaft. We will never know whether one more jump might have accelerated the process, and these days I have more sense than to repeat the experiment. In the interests of history, at the bottom of that shaft was a neat little dated signature written in pencil: "J.M 1908 ". JM was James Mason, one of the people who worked for William Reddan, the Naracoorte forester who was also caretaker of the caves. 1908 was coincidentally the year in which William Reddan discovered the Alexandra show cave.

Near vertical caves, starting off with holes barely big enough to put a hand in, have been located and investigated at Sellicks Hill over the last half century. Two of these have now been descended to depths of 70 metres, and are expected to go much deeper, following quite substantial airflows. They tend to access larger cavities the deeper they go.

While there may be other shafts to be located at Myponga, successfully accessing the cave through any one of the shafts would enable experienced cavers to conduct systematic exploration of the system and produce a detailed survey as well as a photographic record. All of this would contribute to a better appreciation of the eventual opportunities for science and tourism, as well as possibly identifying other potential access locations for what is expected to be a very extensive and reasonably complex cave system.

ACCESSING THE CAVE – THE PRACTICE

One would expect that on the basis of the information already revealed it would be a simple matter to go to the spot marked "X" on the map and find the entrance waiting for us with a neat little sign saying "This Way, Please".

It hasn't yet worked out that way, for several reasons. The first is that the hills are steep enough to fall off. Local advice is that while they are barely negotiable in the dry weather, when the grass is dry and slippery, then the wet months will be even more difficult. Early trips involving digging equipment, and if successful, later trips involving caving equipment, will require it to be carried in. so we will at the very least have to set up a couple of solid belay points, and use ropes to go up and down the hillside

The second problem is that close inspection shows the green vegetation along the bottom of the valley to be "wall

Blackberries

to wall" blackberry. We expect we will have to lug a brush cutter or two in there. Murphy's Law tells us the stream sink will be in the middle of the densest stand of blackberry.

There have been several brief visits to the area over the past month or so, and I particularly wish to acknowledge the assistance provided by the relatively young and fit Frank Hankinson and Neville Skinner in worrying about my old bones climbing down and up the hill. But I am disappointed that neither has been willing to plunge headlong into the thickest part of the blackberries at this stage. With that sort of attitude, how are we ever going to find the entrance?

Neville and Frank checking out Holes

Searching for a Stream Sink

The third problem is that while the upper reaches of the blackberry gulch start off on SA Water land, below their silt settling ponds, further downstream where the gulch intersects the limestone, it has at that point wandered away from the government land and into the neighbour's place. Luckily, our discussions with him have also been positive.

And of course, there is a fourth problem, which relates back to the first two. Climbing down a shaft that descends directly from a creek-bed is just asking for cloud bursts to appear out of blue skies and initiate the occasional flash flood.

That's enough problems to solve for the present. Should the siren call of this particular projected entrance remain elusive, there are a couple of other encouraging places to look.

SUMMARY

To summarize, what has happened in the past is in the past, and the purpose of this exercise is not to lay blame for what, clearly in hindsight, could have been handled better. Of course, it is nevertheless important that we learn from past shortcomings if we wish to avoid repeating them in the future.

My only regret, even at this early stage, is directed more at myself than anyone else. I wish to some extent that I could have started pushing this "barrow" a long time ago, so that I could have some chance, before I get too old, of seeing some spectacular outcomes for what will inevitably turn into a lengthy project. On the other hand, the time is clearly right in many other ways. Without construction of the reservoir the filtration plant would not have come to pass. Without the filtration plant, the settlings ponds would not have come to pass. Without the settling ponds, the valley floor would not have stayed green over summer, and without the implications of the limits to that green indicator, we would not be aware that water sinks where the valley intersects the limestone, even if we have yet to find the exact spot at which it does.

Despite my own concerns about the passage of time, thanks to the forward thinking attitude of the current South Australian Government and its recently adopted policy of opening up the Myponga Reservoir for carefully managed community recreation, the timing could not be better for initiating a project to gain access to a major cave system that was briefly revealed by construction of the dam over 60 years ago.

It would be a wonderful outcome if we could, to the degree possible, restore one of South Australia's significant natural assets and realise its potential as a future tourism drawcard for the Fleurieu Peninsula in particular and South Australia in general. It would be even more positive for South Australia if this activity could be presented to the world as a land-mark gesture of the South Australian Government in recognition of the International Year of Caves and Karst.