# *Tenison-Woods: Australia's First Karst Scientist*

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**Abstract**

In March 1857, Father Julian Tenison-Woods arrived in Penola (South Australia) as a newly-ordained parish priest. Over the next ten years, he rode to and fro across his immense parish, carrying out his responsibilities as a priest, and making a significant contribution to the development of the church in Australia.

But at the same time, he was a keen observer of the natural environment, including the karst landscape and the caves beneath it. His first publication appeared in 1857 and in 1862, his Geological Observations in South Australia, principally in the district south-east of Adelaide was published in London. This is a landmark publication in speleology, although that was only one of the topics upon which he wrote.

He discussed the prevailing theories of that day about caves and karst, but also described his own observations and understandings, a number of which have been validated by recent research. By the time of his early death in 1889, he was recognised as one of the leading natural historians of the country.

One remarkable aspect of his crowded and creative life is that he was subject to continuing illness which was only properly diagnosed in 2006!

## Early Years

Julian Edmund Woods was born on November 15th, 1832 at Southwark in London. Little is known of his father, James Woods, who was of Irish origin and, although qualified as a barrister, turned to journalism as a senior reporter and sub-editor of the London Times. He appears to have been nominally a Roman Catholic, but with a marginal commitment to the church. His mother, Henrietta Maria Saint-Eloy Tenison, came from a distinguished family, many of whom were clergy in the Anglican Church and one Thomas Tenison was Archbishop of Canterbury. Their relationship to the church remains obscure, although Julian claimed at one stage that his mother had converted.

Julian was baptised in the Catholic faith and, although he did not use the name Tenison until his mid-twenties, he was actually christened Julian Edmond Tenison Woods. He also claimed to have grown up as a Protestant and later converted to Catholicism. His early life story is full of such ambiguities and contradictions, raising a number of problems to his many biographers (O'Neill, 1929; Press, 1979, 1981, 1989, 1994). This first section will focus primarily upon Julian's spiritual development, as that provided his foundation as a human being, out of which his science germinated.

He found schools a difficult environment and gained much of his education from his father. This involved encouragement of his wide reading, including the classics in Greek and Latin, discussions about history and public affairs, learning to play the piano and to draw, and studying natural history. Thus, his father gave him a sense of broad and open inquiry and of self-education, but underlying this, a great love of reading and writing.

In 1848, Father Frederick Oakely came as a new priest to the Southwark Church. Oakely led him into fully adopting the Catholic faith – a confirmation from which he never wavered. He came to see Oakely as the first of his central spiritual mentors, writing many years later in a still unpublished manuscript (as quoted by Press, 1994, p. 26): "He was a singularly gifted man, a most attractive writer and eloquent preacher. His loving and lovable nature gave him a large circle of warmly attached friends, while his great powers of conversation, many accomplishments and wonderful musical talents made his society most delightful. His disposition was lively and even playful, enjoying a joke and hearty laugh as much as most men . . ."

It is particularly interesting to recognise these very qualities in descriptions of Julian himself as a priest in South Australia (e.g. in Hepburn, 1979: 107-109).

During his work with Fr Oakely, he was subject to frequent illnesses, and this interfered with the austerity and discipline required of a novice. In due course, his recurrent illness led the Passionist order to grant dispensation from his vows and to advise he seek some milder rule. He was devastated by this decision, but counselling from Fr Faber, a famous theologian and friend of Oakley provided the support and direction he needed at this time. On Faber's advice, he moved to France and the Marist novitiate. Again, his bouts of illness persisted and he was advised to give up the rigors of study. His disappointment was relieved by the offer of an appointment to teach English in the Marist College at La Seyne-sur-Mer. Here, he benefited immensely from the spiritual advice and teaching of the college director, now St Peter Julian Eymard. He saw Eymard as probably the greatest of his spiritual mentors, and wrote (again from the unpublished memoirs, Press, 1994, pp. 46-47): "He was certainly a saint, with the sweetest patience in all his dealings with the members of the college. . . he was a man also of the deepest spiritual knowledge, with a recollection and a spirit of piety which shone in all his actions. He was a tall thin man, with the face and expression of an angel. Though rather shy and reserved, his conversation was charming and instructive . . . He helped me so much to be more resigned to the will of God and less uneasy about the future. Thus he helped me more than even Father Faber or any of my spiritual directors always excepting Father Oakeley. Father Eymard was in my mind as great a saint as Father Faber, but differing completely from him. He was shy and retiring with a deep hidden devotion, a spiritual life with the spirit of the Blessed Eucharist, for the honour and adoration of which he founded his order." (Memoirs, p. 179).

In due course, he returned to his family in London

and Julian was introduced to Bishop Willson of Tasmania who invited him to migrate with a view to his later ordination. His time in Tasmania was disappointing so he travelled to Adelaide and visited his brother James, later appointed as director of the South Australian Roads Board. Here he spent some time regaining his health, and working as a journalist with the Adelaide Times, but still endeavouring to find a place where he could continue his theological training and progress to ordination.

In due course, he met Bishop Murphy, and on his advice, enrolled at St Aloysius, the Jesuit College at Sevenhills. Here he recognised the principal, Fr Tappeiner SJ, as a still further mentor in his developmental progress, and also developed a close friendship with Fr Hinteroeker SJ. He not only continued and deepened his theological education, but also undertook courses in mineralogy and geology. After this final study of some six months duration, he finally attained his long-held ambition and was ordained as a priest at St Patrick's Church in Adelaide.

## Priest and Scientist

Shortly after ordination he was sent to a parish of some 35,000 square kilometres, based at Penola, but extending to Portland in Victoria, and along the coast to Mount Gambier and Robe, thence north to Bordertown. He rode his horse ceaselessly throughout the region, visiting virtually every family, and steadily building the spiritual influence of his own church. At the same time, he constantly recorded his scientific observations of the region.

It was here that he almost immediately commenced his scientific writing, but even those who criticised him generally recognised that he never departed from or fell short in his spiritual duties. He was constant in his own spiritual observances, leadership of his widely scattered parishioners, and his efforts to develop the necessary church buildings. He always claimed that the priesthood was always his first consideration and science followed as he was able to find time. But the accusation of neglect of his spiritual responsibilities often arose, particularly from those who objected to his individualistic thinking.

He soon made many friends within the limestone coast region and two of these played a particularly important role in his on-going inquiry. Adam Lindsay Gordon had a great love of riding and shared many of Julian's journeys across the parish. He was also a great poet and classical scholar, so the two friends would share in their joy of the classics while riding. It appears that this friendship led in turn to a further friendship with Samuel Pratt Winter of Murndal.

Samuel Pratt Winter arrived in Victoria with the Henty family in 1837 and squatted on what became Murndal station. Although a somewhat isolated aristocrat in his personal behaviour, it is particularly interesting that the first building erected on the site was a small hut that would serve as a schoolroom for his shepherds and for the aboriginal people of the region. He often travelled with a small retinue of staff, generally of aboriginal origin. In about 1841 the original building was replaced with a permanent one of local stone. The rest of the now sprawling homestead was built over and around this. The old stone building was later lined with timber and is the present day library (Kiddle, 1961, Forth, 1991). Although Winter was an atheist, he enjoyed the company of, and conversations with, Tenison-Woods. He not only made his own library that included Lyell's Principles of Geology available to Julian, but also purchased books when visiting London, specifically for Woods' use.

Woods' first scientific publication on Australian geology dealt with metamorphic rocks in the Clare district north of Adelaide. An extensive article soon followed this on the Mosquito Plains (Naracoorte) Caves, which appeared in the South Australian Register of 29th March 1858. Most of this article was actually included in his later book (see below) and the 1858 article has generally been overlooked, even though it contains historically important material.

His most important work in the Naracoorte area was *Geological Observations in South Australia: Principally in the District South-East of Adelaide* (Tenison-Woods, 1862). This book ranged widely over the geology of South Australia but, in particular, included chapters on the limestones of the South East, three chapters on the volcanoes and three on the caves. The first of these was based very largely in summarising the then authoritative work of Lyell (1830-1833) but the second two dealt with Julian's own observations in the South East region. It is important to recognise that one or more pages of the original manuscript were apparently lost. There is a significant discontinuity in the text in both the 1858 newspaper article and *Geological Observations* (page 331). This discontinuity has on several occasions lead speleologists to search for an assumed further series of cave passages. Other writings on the region and related topics included Tenison-Woods (1859, 1866, 1879a, 1879b, 1879c). Woods claimed in letters to his friends that he had found it impossible to locate a photographer who might provide him with illustrations for publication purposes. He said: "One might as well expect to find a newspaper on the streets of Peking as an itinerant photographer in the South east". However, he obviously succeeded and although it has so far been impossible to identify the photographer, or even to discover the source of the originals, copied by historian Les Hill, there were in fact three photographs taken. The illustrations by William Archer that appear in *Geological Observations* were based upon two of these.

In reading *Geological Observations,* one can readily detect an intellectual struggle between acceptance of Lyell's ideas, as those of the then most significant author on geological principles, and his own observations. Lyell's work was very largely based upon caves in the hard rock limestones of Europe that are totally different in geological history, geomorphology and general character from those of Naracoorte.

His major mistake in interpreting his observations was in relation to the polje at Swede's Flat near Bordertown that he wrongly explained as a former coral atoll, while at the same time accurately recognising the character of its hydrology. Fortunately, Woods' individualism would not allow him to suppress his own views. He clearly identified the dune ridges as being of aeolian origin, although many of his contemporaries argued for a marine deposition origin. He recognised the extent to which the fossil

deposits in the cave were a result of many episodes of seasonal flooding. He also rejected strongly Buckland's theory of the biblical deluge as the origin of fossils, even though he had at one time accepted it. Similarly, he rejected the prevailing theory of the day that caves were excavated by underground rivers and pointed to their phreatic origins (although not using that term). He also, again without specifically enunciating it, indicated an awareness of syngenetic development (pp. 347-348). This was more than a hundred years prior to its proper scientific recognition.

In recognising the mammalian fossils buried under the flowstone in the so-called second chamber of Blanche Cave (Fig. 1), he correctly reported that they were all of relatively recent origin and not comparable to the discoveries of Mitchell at Wellington Caves. He did recognise that one bone discovered elsewhere in the region was, perhaps, more comparable with the Wellington material. He also recognised that the common assumption that the fossils were a result of the caves acting as pitfall traps was largely wrong. He realised that the fossil deposits resulted from dead animals, bones and sediment being washed into the caves during periods of high water levels and flooding.

The Miocene limestones of the region, with their wealth of marine fossils, almost certainly provided the starting point for his long-term studies on the geo-history of the Australian Tertiary (see Press, 1994, pp. 261-274). During the course of these studies, he described and named several hundred species of molluscs and some other marine fossils. He also moved into reviewing the botany of the region with the support and encouragement of Baron Ferdinand von Mueller. From this he was able to utilise the patterns of vegetation distribution to map the underlying soils and related them to his work on regional geology.

By the time he left Penola and went on his further somewhat tumultuous career within the priesthood, he was recognised widely as one of Australia's most expert natural historians. His work demonstrated a quality of geological understanding far ahead of his contemporaries. This is congruent with Player's (1989a, 1989b) findings in reviewing and assessing the whole of his scientific research. The incredible breadth and diversity of his research is clearly indicated by the bibliography in Press (1994, pp. 261-274).

I believe he fully warrants recognition as Australia's first karst scientist. Much of his thinking which was seen as being at best ill-informed or somewhat eccentric, has been fully vindicated, particularly over the last 30 years.

His continuing career in science never abated, but regrettably he found it increasingly difficult to locate himself within the organised Church. His individualism all too often challenged the place of Bishops and as Press (1989) said, "Bishops . . . preferred to forget a priest who could not be slotted into any familiar category." So, he spent many years, often engaged in conflict, and being passed from diocese to diocese as a wandering missioner.

*Geological Observations* was very positively reviewed and widely respected. Sections were reprinted in Europe particularly in the various editions of Hartwig' s Subterranean World. His book was perhaps not so highly regarded in Australia, but some significant individuals managed to ensure that it had a long-term impact. Many scientists quoted it in the course of their own research.

Probably, the most significant line of influence commenced when William Reddan was appointed Caretaker of the Cave Range Forest Reserve in 1886. He made extensive use of Julian's book in developing his own understandings, while searching for, discovering, and exploring a number of new caves. He gave it special attention and proved to have a great creative capacity in the quality of cave management that he established.

He recognised from the beginning that there was a significant opportunity to find older fossils in the caves of the region and was always looking for these while exploring caves of the area. While developing the newly discovered Victoria Cave for tourism purposes, he found some fragments of obviously older fossils buried under the flowstone floor. He immediately invited the South Australian Museum to investigate these and both Stirling and Zietz visited Naracoorte to do so. They re-examined the fossils in the Blanche Cave on which Woods had reported, then discovered and excavated fragmented material from Specimen Cave. They did not further investigate Victoria Cave to any extent, as this would have interfered with tourism development.

Recreational caving developed in South Australia during the early 1950s. Mrs Agnes Needham (Reddan's daughter) told the pioneer cavers of that period (including myself) a great deal about the history of her father's work and in particular, introduced us to Geological Observations. It provided a wonderful basis for our own investigations and we succeeded in locating all the many caves described by Woods. Our understandings of what we found were initially based upon Woods' thinking and we were then able to predict further locations simply on the basis of our growing understanding of the geological structure.

Continuing exploration led Rod Wells and Grant Gartrell to discovery of the Victoria Cave Fossil deposits. When a small group were engaged to draft the first Management Plan for the Naracoorte Caves, it was recommended that the site be nominated for World Heritage Inscription. In due course this was done, and of course accepted.

## Wellness and Illness

One of the great mysteries to all of us who studied Julian's work was the severity of continuing illnesses which he suffered. Although this had delayed his ordination, he never allowed it to diminish his energy or to distract him from his commitment to both his role as a priest and his scientific investigations. None of the contemporary diagnoses make any sense in the light of modern medical knowledge. Whenever I have written or spoken of his work, I have always ended by pointing out the immensity of his accomplishments vis-a-vis the continuing illness with persistent pain and discomfort which he suffered.

When I made this statement at a conference held in 2006 at the Mary MacKillop Information Centre at Penola, Pamela Tobin introduced herself to me by

saying "I can help solve your mystery about Julian's illness." She is one of the descendents of Julian's brother, James Woods. Like Julian, she has suffered a continuing series of serious illnesses, but she has also maintained an unbelievably active life as a nurse, and as a very proactive member of her Church. Being a nurse, she recognised that there must be a common basis to her medical problems and set out to obtain a full and accurate diagnosis. It took some years before she found a doctor who recognised the cause of the family illness. A number of family members have now been formally diagnosed as suffering a specific (and rare) form of B-cell immune deficiency that is transmitted genetically. The mode of transmission means that some 50 per cent of each generation of the family will inevitably suffer from this deficiency and the resulting illnesses.

Understanding the active lives of Julian, Pamela and many other family members can be illuminated by the work of medical sociologist, the late Aaron Antonovsky. A key turning point in Antonovsky' scholarly career was when he turned away from questions about what made people ill to the questions about how people remained well. Thus, he turned from studying disease to studying wellness, and in particular to why some people remained well even when suffering extreme stressors that made many others very ill.

Antonovsky established a research program amongst thousands of people all over the world so that his results were tested in a very wide range of cultures. He summarized his findings in developing the concept of Sense of Coherence (SOC). He saw this as being an interrelated group of three themes or components in human experience. The first he saw as Comprehensibility – having a well integrated view of one's own place in the world and of seeing that world as being relatively consistent, predictable or explicable. The second is Manageability - the feeling that one has the resources available (either internal or external) to cope with the demands or challenges that we face, and the third is Meaningfulness - the sense that life is sufficiently meaningful for a person to be motivated to address and engage with whatever comes. Many similar sets of ideas in human thought have been enunciated and discussed, but one of the unique elements of Antonovsky's work is the thoroughness of his research evidence. He focused very clearly on coping and wellness and his arguments are very pertinent to understanding the response of Father Julian and other family members to their own very numerous challenges. (Antonovsky, 1987).

So, we can now not only diagnose Julian's illnesses, but also explain why he and some other family members have been able to cope extremely well. We have recently joined in a celebratory family reunion at which Pamela and I were able to fully explain the family experience. We also have a paper ready to go to press which tells the whole story.

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