

## Julian Tenison Woods: Natural Historian

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‘The time has again come around when the duty devolves upon me to deliver the Annual Address to the members of the Society’. With these words the Rev. Julian Edmund Tenison Woods commenced his 1880 Address at the conclusion of his second term as President of the Linnean Society of New South Wales.

Tonight I wish to provide a brief introduction to the scientific works of Father Tenison Woods and to highlight his contributions to the study of Australian natural history. Tenison Woods has in recent years come to public attention because of his close association with Saint Mary of the Cross, Mary McKillop, with whom he was associated in the early years of the Sisters of Saint Joseph. For those interested in an account of the life of Tenison Woods, his work as a priest and his problematic relationships with the Catholic Church hierarchy, I refer you to the second edition of ‘Julian Tenison Woods: Father Founder’ by Margaret M. Press (Press, 1994). In the present paper I do not wish to address those aspects, which are clearly out of my area of expertise. What I want to do is provide an overview of the very major contribution made by Tenison Woods to early studies of natural sciences in Australia. I cannot hope to cover in detail the numerous papers he published in the period from the 1850s to his death, at the age of 56, in 1899. A detailed bibliography, including a list of published scientific writings, can be found in an Appendix to Margaret Press’ biography.

Julian Woods was born in London into a large family of 11 children, a family that encouraged learning and especially the study of nature. His education appears to have been quite haphazard and he attributed much to his father, especially his interest in history. His father, James, was a member of the Society of Antiquaries. Woods developed a lifelong habit of reading, of self-education and an interest in a broad range of disciplines. He spent much of his late adolescence and early adulthood seeking his vocation,

and this included a brief period in France, where he had hopes of improving his health. This concern for his health played a role in his decision to migrate to Australia. In 1854 he set out for Tasmania arriving early in 1855, but disappointed in what was offering there he left to visit relatives in Melbourne, before moving to Adelaide towards the end of 1855. He was eventually ordained a priest in Adelaide in 1857, and a few months later began his work in the parish of Penola, in southeast South Australia. In 1866 he and Mary MacKillop founded the Sisters of St Joseph, dedicated to the education of the Catholic poor and others with social needs. Later that year he was appointed Director General of Catholic Education in Adelaide, a position he held for some four years. After he was eased out, or perhaps actively ‘moved on’, he worked as a missionary priest in New South Wales, Tasmania and Queensland. He continued to have difficulties with his superiors but remained in this role until 1883 with little apparent support, and in some cases active opposition, from the Church hierarchy.

Before discussing the scope and significance of the research undertaken and published by Tenison Woods it is appropriate to consider the special attributes that he was able to bring to his scientific life.

- His background as a keen observer of natural history in both England and briefly in France, was sufficient for him to perceive similarities and differences in the fossils of different localities, especially in the Tertiary fossil faunas. He did not interpret the Australian situation in isolation; he saw the bigger picture. In one of his earliest papers on fossils in the limestone at Mount Gambier he alluded to similarities with fossils in the chalks of the Upper Crag in Suffolk, England.
- He grew up in a household where his father worked as the parliamentary reporter for *The*

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*Times* and at various stages in both England and Australia Tenison Woods found employment with the press. This presumably gave him confidence and connections when it came to publishing some of his material, especially in the earlier period when there were few relevant journals being published in Australia.

- He was courageous in publishing in areas of Australian natural history where there was little or no background, but he acknowledged these shortcomings.
- He maintained contact with key researchers, initially in Europe. Especially key here was encouragement from Charles (later Sir Charles) Lyell, the father of geology. His interactions with scientists in Australia were, I believe, key to his influence in the developing colony. His extended period as a missionary priest in eastern Australia including Tasmania and later the Northern Territory allowed him to make personal contact to mutual advantage and this is well exemplified in his relationship with F. M. Bailey, with whom he published on botany in Queensland.
- He was hard working with an enviable scientific output despite his commitment to church matters. This aspect was alluded to in his own writing, but also that of colleagues.
- He had a special capacity to read and synthesise material, and to collate it in readable form. This is particularly evident in his book on the 'Fish and Fisheries of New South Wales', to which I will refer later.

Tenison Woods had a lifelong commitment to public education. This was demonstrated from his time in Penola where he saw the education of the children of the poor as essential, and throughout his later period as a public intellectual and scientist. It is difficult to separate his zeal for public education and his enthusiasm for science. He regretted the low status of fundamental science in society. In 1880, in words which are of particular relevance today, he wrote 'Scarcely a meeting or a public discussion is there in which some daunting allusion is not made to the progress of knowledge and our intellectual achievements. This as far as it goes, is a sign of some sort of appreciation in which the labours of a few are held' but 'Science and scientific study are not popular. Scientific results, when they benefit mankind, are appreciated and admired, men of science, when their reputation is established hold a high and honourable position; but the labour by which all this is acquired has very few votaries indeed'. Tenison Woods did as much as anyone to address this problem of the image

of science and scientists through public lectures (in 1865 for instance two lectures on the geology of Portland Victoria; and on leaving Penola a summary of his natural history observations was made in a lecture entitled 'Ten Years in the Bush'). He also published a large number of letters and commentaries in the press.

In assessing Tenison Woods' contribution to various disciplines, the scientific environment in which he found himself needs to be taken into account. In broad terms, the 19<sup>th</sup> Century studies of natural history in Australia fall into three categories. In the first period specimens were collected on exploration voyages and returned to Europe for their scientific investigation, in the second collections were made by Australians but generally described overseas, and in the third period they became the subject of Australian studies. Tenison Woods' earliest scientific work is in the second period; for instance he made a large collection of fossils and sent them to Britain, to Sir Charles Lyell who much encouraged him with his geological studies. Tenison Woods went on to become one of the key players in the third phase, collecting and then himself describing new taxa based on those collections. Because he collected material in the field, rather than working on necessarily limited collections, Tenison Woods developed a keen understanding of plasticity within the species and speculated on variation attributable to both biogeographical aspects and local changes of environment. This meant that he did not describe as new taxa every variant he came across. This is well demonstrated in his work on littorinids, or periwinkles.

In his Presidential address to the Society in 1880 (Tenison Woods, 1880) he referred with pride to the 'labours of scientific men in the colonies', many of whom he knew personally, and he addressed the difficulties they encountered with access to the relevant literature. He commented that when he made his earliest studies on Tertiary fossils in South Australia the written works of the key European palaeontologists were (not unexpectedly) 'not accessible in the Australian bush'. He drew attention to the problem of access to scientific papers generally, noting that much was scattered through the scientific journals of Europe or attached as appendices to works on the colonies. 'How few for instance, have seen Dr Lindley's papers on the flora of Western Australia or Stutchbury's remarks on the Natural History of Port Jackson. Would any library in Australia be likely to contain the Proceedings of the History Society of Metz, with Arthur Morellet's descriptions, or how difficult it would be to obtain Menke's Latin pamphlet on the Mollusca of New Holland, published

in Hanover. A valuable pamphlet of Menge's on the Mineralogy of South Australia is as difficult to meet with as an Elzevir Sallust' (published by the House of Elzevirin 1634).

This situation underscores Tenison Woods' commitment to, and recognition of, the important role that societies such as the Linnean Society of New South Wales played in publication of science of local interest and importantly in the 1800s in making the results readily available in Australia. He noted in his 1881 President's Address that during the past year the Society had 'issued a volume which will bear comparison with any scientific serial for the extent and importance of the matter contained'. He also congratulated the Society on seeing the necessity of having some rooms and a library of its own. Tenison Woods was also reputed to have a significant personal library.

Julian Woods' first major scientific work was 'Geological Observations in South Australia: principally in the district south-east of Adelaide' published in 1862. He was conscious of the need to establish his reputation and at some stage, certainly by 1866, had begun using his third given name (Tenison, the maiden name of his mother) to distinguish himself from two other natural scientists surnamed Woods. Thereafter all of his scientific papers used the appellation Tenison Woods, hyphen or not.

Tenison Woods published on a wide range of topics, a breadth that for a researcher in the 21<sup>st</sup> Century is unimaginable. He was an astute observer of natural history and made significant original contributions in geology, palaeontology, botany and zoology. His interests were perfectly aligned with those of the Linnean Society of NSW. His breadth of scholarship, however, encompassed far more than the sciences and in addition to Church matters he published on history, bibliography and more. His early reputation was established in large part on essentially non-scientific works, with the publication of his 'History of the Discovery and Exploration of Australia' in two volumes in 1865 (even if the Geological Observations in South Australia had been published three years earlier), and his 'Australian Bibliography', a serialised survey published in the Australian Monthly Magazine from 1866 – 1867. Some of his most important scientific publications affirm his great capacity to synthesise material and to present it in a cogent manner, rather than the creation of new knowledge. This is most evident in his major book 'Fish and Fisheries of New South Wales' published in Sydney in 1883. This major work is of such significance that it has been republished as a 'forgotten book'. The book was commissioned by

the Colonial Government as a complete handbook of the fish and fisheries and was designed to promote development of this resource. It was to accompany the New South Wales Exhibition at the Fisheries Exhibition in London in 1883. This commission came at a propitious moment when his major source of income through missions was no longer available. In this we can perhaps see the hand of William Macleay (perhaps the nearest thing the Linnean Society of New South Wales has to a 'father founder') whose investigations into ichthyology were, to quote Tenison Woods, 'given most distinguished votaries'. In the fisheries book Tenison Woods' skills in writing for a general audience are beautifully exemplified. Recognition of the value of this publication and other works came from the unusual source when King William III of the Netherlands awarded him a gold medal for the best publication of the Exhibition, when the treatise had been translated into Dutch for the Amsterdam Exhibition in 1884.

What I've said up to now has been of a general nature. I now want to turn my attention to Tenison Woods' research papers. While initially these were largely focussed on geology he later expanded his published research to physical geography and natural history more broadly. Geology remained his favourite interest and embraced palaeozoology, with a particular interest developed in marine Mollusca and Bryozoans. By the late 1870s he had also published extensively on corals, echinoderms, and land snails. His interests broadened considerably thereafter, such that in 1879 he was publishing on the vascular flora (distribution and biogeography), fungi and lichens. By the early 1880s his developing interest in fossil flora and coal deposits came to the fore. This aspect, and an interest in mineralogy generally, is reflected particularly in the papers in the latter part of his scientific career when he travelled and made observations in northern Australia and in southeast Asia, especially Malaya.

In September 1989, the Centenary of Tenison Woods' death, the Earth Sciences History Group of the Geological Society of Australia Inc. in Sydney organised a symposium on the scientific work Tenison Woods. The symposium was strongly supported by the Sisters of Saint Joseph, who gave generous financial assistance. Papers from that meeting were published, by the Royal Society of New South Wales, in 1991. The comments that follow are largely based on those papers and directed to Tenison Woods' contributions to geological studies, where he had his greatest impact. Before I do that however, and as a botanist, I should make a comment on his later botanical publications. Peter Martin, in the papers resulting from the 1989 symposium, wrote that Tenison Woods was 'a highly

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competent botanist. His published papers on modern and fossil botany would, by themselves, have been sufficient to establish him as a significant figure in the annals of Australian science'. In my view this assessment applies to his work on fossil floras only. His botanical work on living species was undertaken largely in Queensland, often in conjunction with F. M. Bailey and was not in any sense ground-breaking. In those papers Tenison Woods did little more than extend the knowledge of the distribution and habitat of some species.

I now turn my attention to the scope and significance of geological research undertaken by Tenison Woods and in doing so wish to acknowledge my debt to Dr Ian Percival, for his commentary and advice.

In 1889, a few months before the death of Tenison Woods, C. S. Wilkinson (NSW Government Geologist and President of the Royal Society of NSW) wrote in his Address for the Clarke Medal - named after another famous Reverend and geologist - that geology was Tenison Woods' 'favourite branch of Science'.

Tenison Woods' geological studies are readily divisible into geographical regions, chiefly South Australia and Victoria, Queensland, New Guinea and the Pacific islands, and Southeast Asia (principally Malaya and the Dutch East Indies), reflecting the areas where he spent sufficient time to develop an interest in the local rocks, fossils, coal and mineral deposits, and landforms. One can't help feeling that Tenison Woods' unusual relationship with power structures in the Church, often moving around the country, played out to the benefit of science and exploration. The regional interests also shaped his studies into fossils of particular ages, chiefly Tertiary of the southern Australian mainland and Tasmania but including the preceding Mesozoic Era in Queensland. He sometimes delved into specific geological problems such as the origin of the Hawkesbury Sandstone in the Sydney Basin, and published observations on the geology and mineral potential of the Northern Territory (at the time, part of the colony of South Australia). His research therefore had a considerable geographic spread, and included pioneering studies of aspects of regional geology as diverse as fossils, caves, volcanoes, coal and ore deposits, and hydrogeology. A very 21<sup>st</sup> Century way of assessing whether he left an enduring legacy in any of these fields would be to check citations of his work in the most recently published compilations of the geology of the various states and territories of eastern and central Australia - and on this criterion it could be said that his impact has been largely forgotten or superseded, except in the study of Tertiary palaeontology. Perhaps the same

assessment would be made of Charles Darwin or Galileo! As Archbold noted at the 1989 symposium: 'Many of his taxa have survived the subsequent century of study'. Of some 20 species of Bivalvia and 120 species of Gasteropoda named by Woods from Tertiary strata only 3 and 7 respectively have not survived.

Tenison Woods' earliest published scientific studies were made in South Australia and Victoria. Halfway through the decade (1857-1867) that Tenison Woods spent in South Australia, he published his book on 'Geological Observations in South Australia: principally in the district south-east of Adelaide' (1862). This contained descriptions of the volcanic landforms and crater lakes of Mount Gambier, the limestone caves of that area and those at Naracoorte, and notes on the abundant fossils of the Tertiary (Miocene) age of this region, including those from the Murray River cliffs. From these strata in the vicinity of Mannum, Tenison Woods described in 1862, the first fossil echinoid from Australia, referred by him to *Spatangus* and now known as *Lovenia forbesii*. Many of these fossils are identical to those he later described from Victoria, especially the fauna from Muddy Creek near Hamilton, Batesford Quarry near Geelong, and Fossil Beach on the Mornington Peninsula. He recognised the faunal similarities and correlation of these widely separated localities.

In Tasmania, from 1874 until early 1877, Tenison Woods studied the rich Tertiary faunas at the appropriately named Fossil Bluff, near Wynyard in northwest Tasmania. He described at least nine taxa of molluscs of early Miocene age from this locality.

Tenison Woods returned to Sydney in 1877. In a paper at the 1989 symposium Kevin McDonnell assessed Tenison Wood's study on the Hawkesbury Sandstone as one of his major contributions, noting that it provided clear testimony to his considerable stature as a scientist and pioneer Australian geologist. McDonnell wrote of this work: 'His interpretation of the Hawkesbury Sandstone as a wind-blown formation is supported by his observations of its geometry, lithology, sedimentary structures and fossil content; by comparison with aeolian and other formations in Australia and in various other parts of the world, either through the literature or by personal observation; by experiments he conducted with wind-blown sand, and by personal observation of aeolian processes in the field. Although his interpretation of the origin of the Hawkesbury Sandstone as a whole is not accepted today (he did not have available to him the detailed knowledge we now have of the processes and products of fluvial and other environments) his method was sound and his competence undoubted'. I've quoted

this passage in full because it beautifully illustrates some of the generalisations I made earlier: his breadth of approach (geometry, lithology, sedimentology and palaeontology), his experiences allowing comparison with other formations in Australia and world-wide, his attention to the broader literature, and his perceptive field observations.

Following his return to New South Wales Tenison Woods made intermittent visits to Queensland between 1878 and 1883 and these were particularly important in spurring his interest in botany, both extant flora and palaeobotany. Previously he had confined his fossil studies primarily to invertebrate palaeontology. While investigating the coal resources of the colony on a government-funded project, he described elements of the associated *Dicroidium* flora of Triassic age from Ipswich. He also described Cretaceous ammonites and a belemnite from the Walsh River region of northwest Queensland.

At the end of 1882 Tenison Woods had reached some sort of crisis in his relationship with the Catholic bishops and he was required to cease giving missions or officiate in a number of dioceses. At this time he had received a tempting invitation from Sir Frederick Weld, an old Tasmanian friend who was now Governor of the Straits Settlements and living in Government House in Singapore. In this last stage of his geological career, Tenison Woods concentrated more on documenting coal and mineral deposits, continuing the trend commenced in Queensland where he had investigated coal and tin mining areas. Much of this work, both in Queensland and in southeast Asia, was undertaken on commission from government officials. He made observations on the Malay Peninsula, Malacca, Java, Borneo, China, Siam and Japan, and published some of the research in our Proceedings, and general observations in the press.

Following his return to Australia, in the brief period when his health permitted, he further explored the mineral districts of the Northern Territory. In 1885, Tenison Woods speculated that Arnhem Land would become one of the greatest mining centres in Australia. How prescient, even if he didn't know why.

Tenison Woods returned to Australia in 1886, but it was a lengthy journey, and landing in Port Darwin he had the opportunity to visit Victoria River and then undertake some geological survey work on behalf of the South Australian Government. By this time his health, always an issue, was worsening. As long as he was able he wrote up his recent exploration notes.

In his foreword to Margaret Press's biography of Julian Tenison Woods, Paul Gardiner wrote 'There will always remain a question-mark over the spiritual insights which led the gifted founder (of the Institute of Saint Joseph) to act as he did. At times the evidence points to definite weaknesses in his mental processes. These found expression in astonishing language and led to some bizarre courses of action. Woods puzzled his contemporaries'. If Tenison Woods puzzled his contemporaries in the Catholic Church he did not puzzle his scientific friends and colleagues. At the time of his death Professor Archibald Liversidge aware of Tenison Woods' scientific repute, praised his 'great simplicity, courtesy and kindness of manner'; and J. C. Cox, Wood's successor as President of our Society, testified to his 'exuberant industry ... [and] extraordinary variety of attainments'. His memorial in the Waverley Cemetery in Sydney is a fitting tribute (Fig. 1). Erected with public funding, the greatest contributions are reputed to have come from his scientific colleagues.

Tenison Woods received well-deserved recognition in his lifetime. In the year before he died he was awarded the 1888 Clarke Medal of the Royal Society of New South Wales for his natural history



**Fig. 1. Memorial to Tenison Woods, Waverley Cemetery, Sydney.**

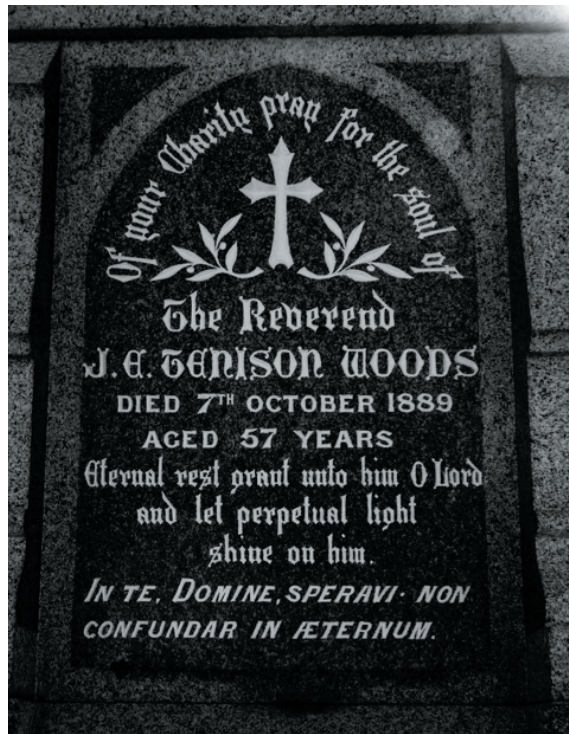
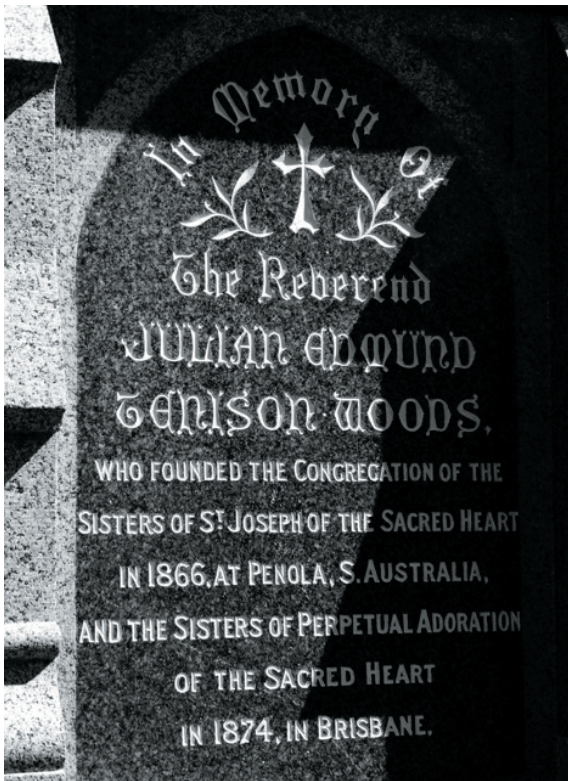
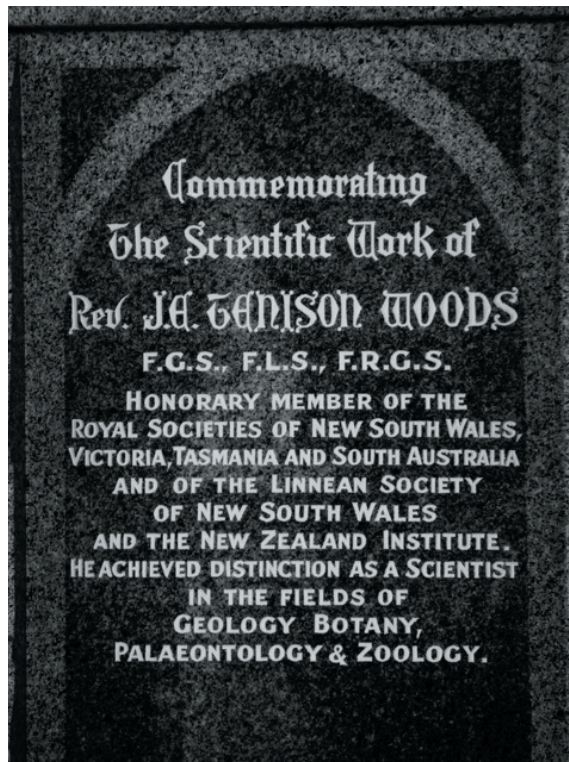
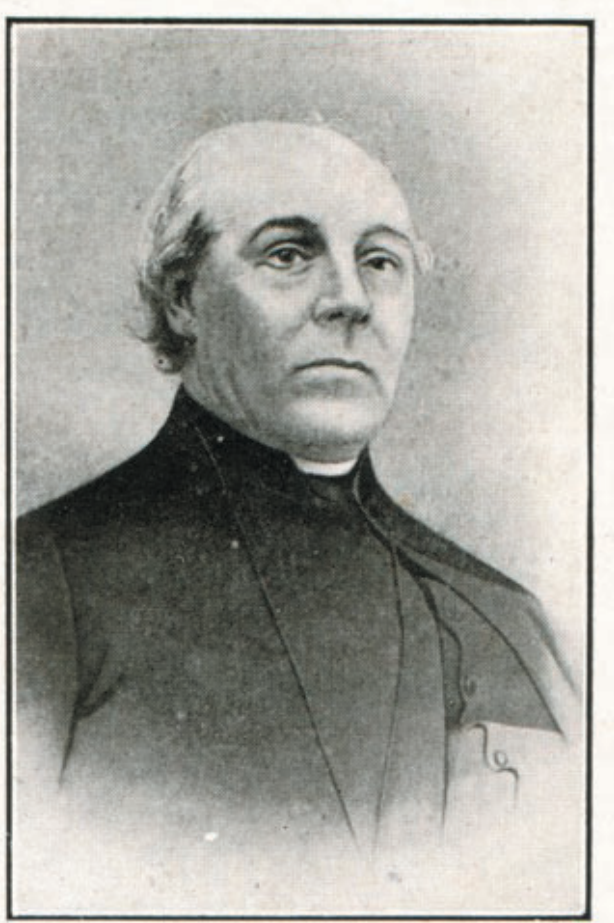


Fig. 1 cont'd. Plaques on the sides of the memorial to Tenison Woods, Waverley Cemetery, Sydney

works generally, but particularly for his geological studies. The Clarke medal, is awarded 'for meritorious contributions to Geology, Mineralogy and Natural History of Australasia, to be open to men of science, whether resident in Australasia or elsewhere'. He was the 11<sup>th</sup> recipient of the Clarke Medal, joining an illustrious group including among others George Bentham, Thomas Huxley, Baron Ferdinand von Mueller, and Sir Joseph Dalton Hooker. He was the only member of the distinguished group not to hold or have held a government scientific post.

Tenison Woods received the Passionist habit on his deathbed, and if the pun can be excused he was also passionate to the end about his science and proud of his membership of scientific societies. He was able in 1887 to list honorary membership of the Royal Society of New South Wales, the Royal Society of Tasmania, the Royal Society of South Australia, the Straits Branch of the Royal Asiatic Society, the Royal Geographical Society of Queensland and New South Wales, the New Zealand Institute, the Microscopical Society Victoria, the Field Naturalists Club of Victoria, and he was a corresponding member of the Royal Society of Queensland and of the Royal Society Victoria. He was also a fellow of the Geological Society of London. The Linnean Society of New South Wales however claims his greatest allegiance: he was admitted to membership of the Society in 1876





**Fig. 2. Tenison Woods, President of the Linnæan Society of New South Wales, 1879-1881.**

and was President of the Society in 1879 and 1880 (Fig. 2), and thereafter Vice-President until his death. He published some 70 papers in our Proceedings.

It would be inappropriate to talk about any 19<sup>th</sup> Century natural historian without some reference, however brief, to Charles Darwin. Darwin and Tenison Woods shared the distinction of being honorary members of the Royal Society of New South Wales. Tenison Woods had clearly read Darwin's 1842 monograph on 'The Structure and Distribution of Coral Reefs'. We know this because he recorded that he was not in complete agreement with all of the conclusions therein. In his 1880 Presidential Address he commented at length on Darwin's book 'Effects of Cross- and Self-Fertilisation in the Vegetable Kingdom' published in 1876, noting especially the impetus to further research the book had inspired. Given the comment in the Australian Dictionary of Biography that Tenison Woods possessed 'profound, and romantic religious convictions based on a childlike piety' one might have wondered about his response to Darwin's views on evolution. There is, however, no

need to speculate. In various places in his 1880 Presidential Address Tenison Woods commended Darwin as 'ingenious', 'conscientious', 'illustrious' and noted the 'perfection of his methods of enquiry'. He concluded 'I can well believe that there is much truth in evolution. If tomorrow the evidence of its occurrence were established on indubitable grounds, it would be one more beautiful illustration of the plan of nature'. It is perhaps worth noting that his views were entirely consistent with those that the Roman Catholic Church finally propagated in the 1950 Encyclical which confirmed no intrinsic conflict between Christianity and the theory of evolution, in other words theistic evolution. That view was almost a century in its formulation.

How will Tenison Woods be remembered? In addition to Tenison Woods' role as it relates to Mary MacKillop (now formally known as Saint Mary of the Cross) he will be remembered always for his key role in Roman Catholic school education, especially directed to the poor and needy. Two schools in South Australia are named in his honour: Tenison Woods Catholic School, an R-7 primary school, in western Adelaide, and Tenison Woods College, an Early Learning to Year 12 Catholic Co-Educational College located in Mount Gambier. His contribution to geography is recognised in the naming of Mount Tenison Woods, the highest point in the D'Aguilar Range near Brisbane.

In science it is for his pioneering role in a number of branches of study and for his advocacy of science that he should be best remembered. By spreading his studies and publications in geology, and natural history more generally over so many subjects, rather than specialising in just one or two fields, Tenison Woods never really became the recognised authority in any area, other than Tertiary palaeontology in which he excelled. Much of his geological work has been superseded by subsequent observations and discoveries and is now largely overlooked. This is particularly true of his paper on the origin of the Hawkesbury Sandstone, widely regarded at the time of its publication as among his best works. However, Tenison Woods has not been entirely forgotten, especially by palaeontologists. He has been commemorated in the names of at least eight fossil taxa and some extant species (even a higher plant, *Leucopogon woodsii*). Ian Percival has provided the following list of fossils named in his honour, including the genera *Jetwoodsia* (a gastropod), *Tenisonina* (a foram) and the species

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*woodsii*, *woodsii* and *tenisoni*. His unusual double barrelled name expanded the possibilities.

*Austrotriton woodsii* (Tenison Woods, 1879) Batesford Quarry, Geelong, Vic

*Jetwoodsia apheles* (Tenison Woods, 1879) Muddy Creek, Hamilton, Vic

*Belaphas woodsii* (Tate, 1888)

*Lovenia woodsii* (Etheridge, 1875) Murray River Cliffs, Sunlands, SA, Loxton Sands Formation

*Terebra tenisoni* (Finlay, 1927)

*Mopsea tenisoni* (Chapman, 1913)

*Jetwoodsia nullarborica* (Chapman & Crespin, 1934)

*Tenisonina tasmaniae* Quilty, 1980 (Early Miocene foraminiferid from Fossil Bluff, Tas.)

As I come to the conclusion of this address I wish to return to Tenison Woods himself and the hopes he had for the future of our Society. He referred specifically to the helping hand that we can extend to ‘students of science, especially beginners’. This aspect has now developed as one of this Society’s main objectives, with grants available through several bequests and donations. I am delighted to acknowledge the very generous donation from the Sisters of Saint Joseph as a practical way marking the Sesquicentenary of the Foundation of the Congregation by Father Julian and Mary McKillop on March 19, 1866. Through their generous donation the Linnean Society of New South Wales will fund research in any one of the fields in which Tenison Woods made his contributions to the natural sciences.

My last words are fittingly from the 1881 Presidential Address by the Rev J. E. Tenison Woods as he stood down from the Presidency and took up a position as Vice President. ‘I must again congratulate my fellow workers in this Society on their industry and zeal. They have laboured so indefatigably that I can look back to the period of my Presidency as one which has largely added to the reputation for usefulness and efficiency which the Linnean Society has gained’.

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